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Strategies for Catalyzing Clinicians' Support of Telemedicine Programs in Rural Communities

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Abstract

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MA, Azusa Pacific University, 2009

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Clinicians' failure to accept contemporary technology has been a critical barrier to telemedicine program adoption. Staff technical challenges and resistance to change can affect technology return on investment, which concerns telemedicine program leaders. Grounded in Davis's technology acceptance model, the purpose of this qualitative, descriptive single case study was to explore strategies used by program leaders in the Marianas Islands who successfully gained clinicians' acceptance of contemporary technology. The participants were 5 program leaders recommended by their institution because of their leadership role and telemedicine technologies experience. Data were collected from 4 face-to-face and 1 audio teleconference interview with the 5 leaders. Three themes emerged from the thematic data analysis: utility of technology, technology usability, and engaging clinicians. The key recommendation for program leaders is to streamline business processes through low-effort technologies while involving clinicians in the design process. Improving the acceptance of contemporary technology among clinicians in rural communities may contribute to positive social change by providing greater accessibility to specialized healthcare and employment opportunities for people in underserved locations. Gaining clinicians' acceptance of contemporary technology is vital to telemedicine programs' success by maximizing return on investment and achieving the organization's business and clinical objectives.

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Dedication

I dedicate this study to my family, my greatest treasure on earth. My wife, Dr. Rizalina Liwag, the one who encouraged me to pursue this meaningful journey of scholarship and infinite possibilities. Thank you for being a role model and providing support through all the academic and personal challenges along the way. To my children Asia, Blesilda, Autumn, Nathaniel, and Amber, my inspiration to complete this study and my reason and hope for the future. To my parents Pete and Eden, who gave me a great start in life and for being there to cheer my accomplishments. To my mother-in-law Adelita Molina, who is supportive of my endeavors. Finally, to God, my creator, for giving me the blessings and the opportunity to serve others.

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Section 1: Foundation of the Study

Exploring strategies to gain clinicians' acceptance of contemporary technology may address the problems of accessibility to specialized medical care for people who live in remote areas. The successful adoption of current technologies could improve the effectiveness of telemedicine programs and reap cost benefits in the healthcare field. Yang et al. (2015) performed a cost analysis of pediatric telemedicine consultations in rural emergency departments (EDs) and found a significant cost savings of 57% as compared to telephone consultations made to consulting specialists to treat injured and acutely ill children. Other studies of medical services provided in rural communities using telemedicine technology have presented cost efficiencies and improvements in the quality of care (Marcin, Shaikh, & Steinhorn, 2015). Even with benefits demonstrated by telemedicine advancements, barriers to acceptance and adoption of contemporary technology in the healthcare field still exist.

Background of the Problem

People who live in remote communities of the United States face a reality of unequal access to specialized healthcare. The rising cost of healthcare limits the delivery of specialty medical services and resources in remote areas. The Center for Medicare and Medicaid Service has reported that by 2022, healthcare expenditure in the United States could reach as high as 20% of the gross domestic product if cost-effective solutions are not implemented (Kvedar, Coye, & Everett, 2014). The increase in costs challenges healthcare leaders to sustain a level of care in small clinics and hospitals in rural communities with limited staff and resources. Telemedicine technology could be a means

to support access to specialized healthcare and the needs of small clinics and hospitals that serve rural communities.

Though telemedicine technology could make healthcare more accessible, there are barriers in program implementation that continue to challenge its adoption. Weinstein et al. (2014) contended that private medical practices and public healthcare institutions are considering telemedicine due to improved legislation and its alignment with the goals of the Affordable Care Act. Butcher (2015) reported that although telemedicine is a viable answer to the lack of local providers in rural settings, there is skepticism on the part of the clinicians and the technology. Previous studies have indicated that human resources and organizational matters to be the final determinant in the widespread adoption of telemedicine (LeRouge & Garfield, 2013). For these reasons, getting clinicians engaged with this contemporary technology is critical to telemedicine program adoption.

Problem Statement

Clinicians' failure to accept contemporary technology has been a critical barrier to telemedicine program adoption (Kim, 2015; Taylor et al., 2015). Kruse et al. (2016) identified 33 barriers to telemedicine adoption; staff technical challenges topped the list of occurrences at 11%, followed by resistance to change at 8%. The general business problem was clinicians who are challenged by technology and have a high resistance to change create barriers to the successful adoption of a telemedicine program. The specific business problem was that some telemedicine program leaders lack the strategies to gain clinicians' acceptance of contemporary technology in rural communities.

Purpose Statement

The purpose of this qualitative, descriptive case study was to explore strategies telemedicine program leaders use to gain clinicians' acceptance of contemporary technology in rural communities. The target population consisted of five leaders in clinics within a telemedicine program located in the Marianas Islands that have successfully used strategies to gain clinicians' acceptance of contemporary technology. The data were gathered through interviews and observations. The contribution to positive social change includes improved access to specialized healthcare for underserved populations in rural communities.

Nature of the Study

I used the qualitative method for the study. Researchers use the qualitative method to understand meanings, ideas, and experiences using participants' observations, focus groups, and interviews (Baran & Jones, 2016). The qualitative method is suitable to explore and interpret experiences of research participants (Bristowe, Selman, & Murtagh, 2015). In contrast, the quantitative method involves testing hypotheses and analyzing independent and dependent variable relationships or differences using statistical methods (Yilmaz, 2013). The quantitative method was not appropriate in this study, as it did not call for hypothesis-testing nor an analysis of variables' relationships or differences. The mixed-methods approach is a combination of quantitative and qualitative methods (Bristowe et al., 2015). The mixed-methods approach was not appropriate since the study did not test a hypothesis or analyze variables' relationships or differences.

I used the case study design for this study. Researchers use the case study design to explore complex social practices or systems delimited by time and place (Yin, 2018). The case study design is appropriate to explore multiple data types and sources for exploring a phenomenon over time. Researchers use the narrative design to explore events and the history of individuals and not for the exploration of a phenomenon (Whiffin, Bailey, Ellis-Hill, & Jarrett, 2014). The narrative design was not appropriate for this study as the objective of the research does not involve the history of a person or persons. Researchers use the phenomenology design to explore the meanings of lived experiences of individuals (Chan, Walker, & Gleaves, 2015). The phenomenology design was not appropriate for this study since I did not examine the meanings of participants' lived experiences. Researchers use the ethnography design to explore cultures and customs of a particular group (Cincotta, 2015). The ethnography design was not appropriate for this study as I performed an in-depth exploration of strategies and did not seek to interpret cultures and customs of a group.

Research Question

What strategies do successful telemedicine program leaders use to gain clinicians' acceptance of contemporary technology in rural communities?

Interview Questions

1. What strategies have you used to gain clinicians' acceptance of contemporary technology to deliver clinical services?
2. What method did you find worked best to gain clinicians' acceptance of contemporary technology?

3. How did the clinicians respond to your different techniques to gain acceptance?
4. What strategies were least effective in gaining clinicians' acceptance of contemporary technology?
5. What modifications did you make to any strategy to gain clinicians' acceptance of contemporary technology?
6. What additional information would you like to share about clinicians' acceptance of contemporary technology?

Conceptual Framework

I used the technology acceptance model (TAM) as the conceptual framework in this study. Davis (1989) introduced the TAM to predict users' acceptance or rejection of technology and stated the need for validated measures and determinants of technology acceptance in the field of information systems. The tenets of TAM are perceived usefulness and perceived ease of use as the determinants of user acceptance of a technology (Davis, 1989). The TAM evolved from psychological theories such as the theory of reasoned action (TRA) and theory of planned behavior (TPB; Marangunić & Granić, 2015). The researchers indicated that causal relationships exist between the user's perceptions, beliefs, and behaviors toward the design of the technology. I chose the TAM to serve as a likely foundation to develop strategies to gain clinician acceptance of contemporary technology.

Operational Definitions

Extended Technology Acceptance Model (TAM2): Extended technology acceptance model is an extension of the TAM and includes social influence and the cognitive instrumental process (Venkatesh & Davis, 2000).

Perceived Ease of Use (PEU): Perceived ease of use is a construct of the technology acceptance model (Davis, 1989).

Perceived Usefulness (PU): Perceived usefulness is a construct of the technology acceptance model (Davis, 1989).

Technology Acceptance Model (TAM): Technology acceptance model was developed to create valid measures of technology acceptance (Davis, 1989).

Telemedicine: Telemedicine is defined as the use of information and communications technology to provide diagnosis, treatment, and curative measures and is also known as telehealth which also encompasses teleradiology, teledermatology, telepathology, and telepsychiatry (World Health Organization, 2017).

Theory of Reasoned Action (TRA): Fishbein and Ajzen originally presented the theory of reasoned action in 1975 and defined as behavioral beliefs that lead to behavioral intention; behavioral attitude and subjective norms are the two constructs that form behavioral beliefs (Fishbein & Ajzen, 1975).

Theory of Planned Behavior (TPB): The theory of planned behavior was developed to predict behavioral intention through subjective norms, attitudes or behavioral beliefs, and perceived behavioral control; the theory is an extension of the theory of reasoned action (Ajzen, 1991).

Unified Theory of Acceptance and Use of Technology (UTAUT): The unified theory of acceptance and use of technology was developed to unify eight different acceptance models (Venkatesh, Morris, Davis, & Davis, 2003).

Assumptions, Limitations, and Delimitations

Assumptions

Schoenung and Dikova (2016) defined assumptions as a researcher's perspective that he or she considers as true but cannot prove its theoretical validity. The first assumption was that the study participants would fully understand the concepts embedded in the interview questions and would answer them truthfully and accurately. The second assumption was that the participants in this study were program leaders that successfully used strategies to gain clinicians' acceptance of contemporary technology. Third, I assumed that the information provided by program leaders about this research project presented experiences and observations that could be used to improve clinician acceptance of contemporary technology.

Limitations

Yin (2018) defined limitations as possible gaps in the methodology of the study. A limitation of the study was that the island population may be different from the population in the mainland United States. Pacific Island culture and lifestyles are inherently distinct. Moreover, the willingness of participants due to cultural factors and individual participant's comfort level may have affected participation. Another limitation was the geographic location and distance of the Mariana Islands from the United States and other Pacific territories presented a constraint of accessing telemedicine programs in

other rural areas. The geographical confinement and distance challenges limited the sample pool.

Delimitations

Marshall and Rossman (2016) defined delimitations as fixed study parameters set by the researcher. Telemedicine encompasses a wide variety of programs and specialties that are too broad to be explored in this study. The scope of the study focused on the applied strategies of program leaders, not on specific telemedicine specialties. Furthermore, the collection of data was limited to interviews of individuals, observations, and document review within the respective clinics. In addition, the geographical area chosen was in the Marianas Islands and did not include other territories and jurisdictions.

Significance of the Study

This study has significant implications for business practices as well as social change. Each is described in further detail below.

Contribution to Business Practice

This study is of value to the practice of business because of financial and performance implications to healthcare companies with telemedicine programs. Charrier, Zarca, Durand-Zaleski, and Calinaud (2016) assessed the benefits of telemedicine focusing on cost and clinical effectiveness in eight studies comprising of 2,500 patients from the Paris Regional Health Agency. The research resulted in the recommendation for widespread adoption of the technology. The increased use of technology investments can improve rural clinician efficiency and effectiveness and can reduce the cost of providing healthcare (Yang et al., 2015). With the rising costs of healthcare, businesses in the

healthcare field can leverage technology to increase profitability and capability. Rural communities lacking specialized healthcare can particularly benefit from these technologies.

Implications for Social Change

Improving access to specialized healthcare through telemedicine in rural communities and providing employment opportunities may result in positive social change. Marcin et al. (2015) proposed that telemedicine technologies can address the disparities of specialized healthcare access in underserved remote communities but would require workforce development. Olatunji (2015) posited that the shortage of healthcare professionals in rural areas was due to inherent disconnectedness to other providers. Marcin et al. also recognized the declining trend of doctors, nurses, and specialists in rural communities; with the rapid growth of healthcare technologies, employment opportunities to operate and facilitate these programs are available to rural residents through distance education. The development of telemedicine programs in remote communities can improve the health of the rural populace and provide employment and professional development.

A Review of the Professional and Academic Literature

The purpose of the qualitative, descriptive case study was to explore strategies used by telemedicine program leaders to gain clinicians' acceptance of contemporary technology in rural communities. A literature review can provide insight and enrich a research study. Marshall and Rossman (2016) described the literature review as a source of relevant articles to support the researcher's argument and to establish the importance

of the study. Current and past literature related to the TAM and the field of telemedicine research presents supporting evidence to show the basis of the study. Furthermore, the literature review shows the research strategy, depth of inquiry, and organization of the study conducted by the researcher.

The primary strategy for searching the literature was through keywords limited to scholarly articles and restricted searches to current references. I used keywords and combination of words and phrases: *Technology Acceptance Model; TAM; perceived usefulness; perceived ease of use; contemporary technology; telemedicine; program leaders; strategies; clinicians; barriers; acceptance; adoption; rural communities; barriers to acceptance or adoption of Telemedicine; clinician acceptance or adoption of contemporary technology; telemedicine in rural communities;* and *Technology acceptance model in telemedicine*. I used Walden University's library online databases, Google Scholar, and the Mary Ann Liebert online publisher's website.

This literature review consisted of materials gathered from various sources, such as online databases, web-based publications, government and corporate websites, and web search engines. The majority of the articles referenced came from the Walden University subscription service databases: ABI/INFORM Collection, Business Source Complete, Emerald Insight, Sage Journals, and Science Direct through the Walden Online Library. Another source of reference was a web-based publisher clearinghouse, Mary Ann Liebert Incorporated Publishers, which was the source of industry-specific articles included in this review. Also, some references came from government and corporate websites: World Health Organization and the American Telemedicine

Association. Most of these sources contained scholarly articles that related to the topic, theoretical perspectives, and further information on the nature and current status of the telemedicine industry.

One hundred and three references of peer-reviewed and nonpeer reviewed journals, books, and government and corporate websites informed this study (see Table 1 below). The searches performed were sorted by date to ensure the articles were current (within 5 years). Additionally, online tools such as Ulrichsweb, provided by Walden University subscription service, ensured that the journal articles were peer-reviewed. The 91 peer-reviewed journal references are 88.35% of the total reference list. Other references that comprise the literature review are as follows: nonpeer reviewed reference at 0%, one book at .97%, and government and corporate websites at 0%. The total number of sources in the study is 103.

Table 1

Literature Review Source Content

Reference type	<5 Years	>5 Years	Total
Peer-reviewed journals and dissertations	91	11	102
Nonpeer reviewed journals			
Books	1		1
Government or corporate sites			
Total	92	11	103

The literature review of this manuscript had a topical arrangement comprised of significant studies that relate to the TAM, an overview and benefits of telemedicine, and

the barriers and strategies for acceptance employed by programs leaders. The body of the literature review was composed of the following topics: the development and evolution of TAM; overview of telemedicine technology; benefits of telemedicine programs in rural communities; the barriers of technology acceptance in telemedicine; and strategies for clinician acceptance and adoption of contemporary technology. The first topic focused on the conceptual framework. The second and third topics centered on telemedicine. The last two discussed barriers and enablers for acceptance.

The Development, Evolution, and General Acceptance of TAM

In various literature, the TAM is one of the theoretical frameworks regularly used in telemedicine research and is appropriate for this study. Wade, Gray, and Carati (2017) described the different theories associated with telemedicine research, one of which is the TAM model; also, they mentioned that research questions and outcomes are developed based on the theoretical framework selected. This section focused on the TAM and how it can guide the study and help analyze current literary work. Moreover, the history of the model provides insight into its purpose and relationship to the current study.

The purpose of the TAM was to produce valid measures for predicting user acceptance (Davis, 1989). In prior studies, Klein and Beck (1987) expressed the need for criteria to select the appropriate information systems to maximize a company's financial and personnel resources. At the time of the Davis' (1989) research study, measures for user acceptance were subjective and unvalidated. In both studies, set criteria and assessable constructs were essential to evaluate the effectiveness of strategies employed by participants. The TAM presents constructs that are verifiable through research and can

relate to the problem of technology acceptance; the TAM, as a conceptual framework, also has value to predict user intentions.

The TAM was developed from the TRA model, a psychological theory that predicts behavioral intentions and provides a framework that can help view the phenomenon. Fishbein and Ajzen (1975) introduced the TRA model in 1975 and proposed that attitudes and subjective norms influence behavioral intention; the article is out of print but frequently referenced by other authors. The TRA's popularity inspired the development of a model adapted for technology acceptance. Davis (1989) presented perceived ease of use (PEU) and perceived usefulness (PU) as constructs vital to user acceptance; PEU and PU substituted the attitude construct from the TRA model. The TAM is also related to the TPB, as Ajzen (1991) indicated the relationship of TPB to TRA and contended that TRA lacked volitional control and added Perceived Behavioral Control to include attitude and subjective norms as part of its constructs. In social psychology, the TBA and TRA are extensively referenced and widely used to predict intention (Madden, Ellen, & Ajzen, 1992). The TBA and TRA have been often credited for the development of TAM (Marangunić & Granić, 2015). Therefore, the TAM is a conceptual framework that has predictive value that can help with the current study determine user acceptance.

As previously mentioned, the TRA, as well as the TBP, contains subjective norms that are not present in the TAM; mixed findings from other current research still make the TAM a good choice for this study. Researchers have concluded in seminal manuscripts that subjective norms have no notable influence on the intentions of users (Davis, 1989;

Mathieson, 1991). More current researchers have found there is a significant effect of social norms on user intention (Kim, 2015). Mathieson (1991) claimed that although the TPB can help identify barriers and measure system performance, the TAM better explains the attitude toward using technology. While the impact of social norms remains unclear, current research still supports the TAM's PU and PEU to be strong determinants of user acceptance, and recent studies have found that PU is a more significant indicator than PEU (Ducey & Coovert, 2016; Hoque & Bao, 2015). For this study, the TAM was still the appropriate selection for the framework as it appears to be a superior predictor of behavioral intention, as mentioned in past and current research, and continues to develop in technology-related fields.

The TAM has evolved through synthesis with other constructs and models but remains as the primary determinant of technology acceptance. The extended TAM, also known as TAM2, includes in its constructs the social influence and the cognitive instrumental process (Venkatesh & Davis, 2000). The authors included subjective norms as part of the model, which was not on the original TAM. The addition of subjective norms (i.e., social influences) further aligns TAM2 constructs to the TRA and the TPB. Venkatesh et al. (2003) developed the unified theory of acceptance and use of technology (UTAUT) by examining eight different models that have acceptance determinants. The authors recognized that the model had reached its practical limits by unifying the other competing models of technology acceptance and may no longer be parsimonious. In this regard, identifying the original research propositions and verified determinants of technology acceptance identified the foundation and essence of the current study. As the

original TAM model evolved and expanded and variations emerged, Davis's seminal proposition as confirmed by Davis, Bagozzi, and Warshaw's (1989) supported that PU and PEU as essential determinants of behavioral intention to use technology and continues to be referenced in current literature.

Current literature indicates the original TAM continues to be used by researchers to integrate other models to explain technology use. Awa, Ojiabo, and Emecheta (2015) combined TAM with the technology-organization-environment (TOE) model to explain the adoption of e-commerce of small to medium enterprises. In another study, the same combination of TAM and TOE was used to understand determinants of cloud computing adoption (Gangwar, Date, & Ramaswamy, 2015). Cho (2016) combined the postacceptance model (PAM) and TAM to study the intention of users to continue to use health applications on mobile devices. In other studies, researchers developed TAM specific to their industry or field of research. Rho, Kim, Chung, and Choi (2015) confirmed the validity of the original TAM constructs to explain physician behavioral intention to accept telemedicine by surveying 183 physicians. The researchers proposed the telemedicine service acceptance model, which was based on TAM, to specifically explain physician acceptance of telemedicine technology. TAM's validated framework and popularity have secured its acceptance in healthcare and other related disciplines.

In the field of healthcare, the TAM has been found to be an extensible framework to study technology acceptance in various medical settings. Chauhan and Jaiswal (2017) researched the acceptance levels of clinicians and patients in adopting e-health applications and tools. The researchers found that TAM is a reliable framework to

determine varying acceptance levels in different user types and specific technologies. Ducey and Coovert (2016) researched tablet computer adoption of 261 pediatricians in their practice and validated that the two constructs (PE and PEU) that makeup the TAM contribute to technology adoption. The TAM framework is not limited to computer applications and hardware used in the healthcare field but also can be applied to technology systems that support medical operations. Shih, Lu, Liu, and Wu (2017) studied clinicians' adoption of knowledge management systems in a hospital environment. With the emergence of new healthcare technologies including telemedicine, the TAM framework is an appropriate choice for researching various medical settings and applications.

Overview of Telemedicine Technology

For over 50 years, telemedicine has presented innovations in healthcare as technological advancement progressed through the years and different stages of development emerged that influenced telemedicine. Whitten and Sypher (2006) discussed the stages of development of telemedicine; they proposed three evolutionary milestones of the technology: synchronous versus asynchronous modalities, data transfer and storage, and automating decision-making and using robotics. Despite the evolution of the technology, telemedicine's aim to provide remote medical diagnosis has remained the same. Understanding its origins and current progress of telemedicine may help resolve the problem of technology acceptance in the field of medicine.

The space program and telemedicine mutually evolved as programmatic needs and technology changed. Nicogossian, Pober, and Roy (2001) reported that when

suborbital flight in National Aeronautics and Space Administration (NASA) started, the monitoring of astronauts' health had been a critical concern; the administration has been pioneers of telemedicine from the onset of space travel. Space-bound telemedicine shares the same needs as terrestrial healthcare, bringing cutting-edge innovations in service delivery in specialty care to distant and remote areas.

The widespread adoption of computing devices and software applications in the medical field is preparing clinicians and patients for telemedicine use. Galappatthy et al. (2017) observed that the new generations of medical students are using personal electronic devices to access medical journals and apps for diagnostic and drug references. The growing use of computing technology is preparing future clinicians to have the computer skills to operate and use contemporary technology in their profession. Ducey and Coovert (2016) declared that although there is a lag in IT investments in the healthcare field, there is evidence that IT adoption of computer technology is rapidly increasing. The adoption of current technology in the medical field prepares clinicians to accept telehealth. Panicker and Kumar (2016) researched the application of PC-enabled body sensors to monitor patients by remote medical staff in rural health centers; the researchers found that clinicians acknowledged that the system was effective and could reduce the workload of physicians. These clinical outcomes present positive perceptions in the use of technology in healthcare, paving the way for telemedicine to extend medical services to underserved communities.

Telemedicine can deliver specialty care to patients in areas where access to medical care is limited or unavailable. In literature, specialty care, such as dermatology,

has been often unavailable in rural areas; teledermatology has addressed this need and has transformed healthcare delivery in the United States and other countries (Fiks et al., 2018; Mars & Scott, 2017; Yim, Florek, Oh, McKoy, & Armstrong, 2018). The technology can overcome the problem of healthcare accessibility by placing the medical professional within reach. Other specialty care areas, such as pediatrics, neurology, and noncommunicable disease treatment and prevention, can also adopt a telemedicine service delivery configuration and be implemented in these locations (Alexander, Nerminathan, Harrison, Phelps, & Scott, 2015; Driessen et al., 2018; Mars & Scott, 2017; Ray, Ashcraft, Mehrotra, Miller, & Kahn, 2017). With current technology, telemedicine-capable sites, homes, and commonly used mobile devices, healthcare service delivery has become possible. Telemedicine has the potential to transcend the problem of distance and availability through other telecommunications technologies.

The advancement of mobile communications available to the masses encourages the development of telemedicine technology. Berry, Lobban, Emsley, Bucci, and Berry (2016) and Silva, Rodrigues, de la Torre Díez, López-Coronado, and Saleem (2015) contended that due to the high availability of mobile phones in today's modern society, medical interventions via online and mobile wireless have become possible. The proliferation of mobile communications technology has expanded the platforms available for telemedicine use. The cost of mobile services has become more affordable and available to the public (Quaosar, Hoques, & Bao, 2017; Silva et al., 2015; Slusser, Whitley, Izadpanah, Kim, & Ponturo, 2015). Mobile phones are an ideal device to deliver telemedicine services because they are widely available due low cost of ownership. Other

technologies, such as information systems, also support and enhance telemedicine service delivery.

The integration of telemedicine with health information systems improved healthcare services and benefit patients in different parts of the world. In their study, Migliozzi, Zullo, Collins, and Elsaid (2015) claimed that the integration of the home blood pressure monitoring (telemonitoring) and medication therapy management (MTM) improved patients' blood pressure control in addition to detecting and resolving drug interaction problems. The integrated system provided patient information and data to pharmacists, thus enhancing the effectiveness of the program. Also, Vo et al. (2015) proposed a framework of integrated telemedicine (ITM), which included incentivizing the unification of disparate technologies, clinical procedures, and business process. The program model also extends to a national framework of integrated telemedicine. Kato et al. (2015) conducted a study in Japan and Sweden of their plans to implement heart failure telemonitoring to a broader population. The leaders in the medical community need to consider the impact of telemedicine integrations with existing technologies and find ways for their personnel to adopt these innovations.

Integration of information systems can tremendously improve the effectiveness of healthcare service delivery with reaching a larger population. The advancement of Internet technologies has enhanced telemedicine development. The new cloud-based video teleconferencing has many features and advantages from traditional video teleconferencing technology used in telemedicine (W. L. Liu, Zhang, Locatis, & Ackerman, 2015). Cloud-based technologies are dependent on the Internet; cloud

technologies are more intuitive, scalable, and mobile, and can be used in various computing platforms. Jin and Chen (2015) pointed out the use of cloud computing technologies in telemedicine has many benefits, but it also presents new challenges in integration with existing technologies such as the reliability of connectivity in mobile applications, incompatibilities with other data systems, privacy, and security. As with any new technology, the use of cloud computing in telemedicine has presented its own unique set of hurdles, but the prospects of greater accessibility and better usability encourage the development of the technology.

Healthcare advancements through telemedicine have progressed to the point that patients can access medical services directly from home via the Internet. Vyas, Murren-Boezem, and Solo-Josephson (2018) analyzed a pediatric telemedicine program that provided direct-to-consumer medical consultation services via online and mobile devices 24/7. The researchers collected data from the cases received; the analysis was the first of its kind based on their research. In another study also involving pediatric care through telemedicine, Raphael et al. (2017) observed that there were lower readmission rates to hospitals when there was early detection of problems and complications through telemedicine sessions of home parenteral nutrition (HPN) patients. Infections caused by central line feeding tubes has been a frequent problem in HPN cases. Technological innovation can offer access, convenience, and lower costs associated with office visits, such as transportation and time spent in an emergency or urgent care facilities.

Telemedicine has revolutionized and expanded how medical services are delivered. Simon (2015) researched personalized medical e-consulting and teleconsulting

in France, a practice that has been increasing in popularity in many developed countries; personalized medical e-consulting and teleconsulting address the demand for an immediate healthcare consultation via the Internet through personal computing and mobile devices. Patients received healthcare advice via their smartphones or laptops for common ailments and conditions, eliminating the need to go to urgent care clinics. Hong and Hong (2016) explored the growing medical tourism industry, which uses telemedicine as a medium to promote e-hospitals by connecting bilingual English and Chinese speaking doctors with Chinese patients around the world. Medical tourism is an innovative method of medical consumerism. E-hospitals provide care in various settings such as resorts and other vacation destinations, some of which are in remote areas. The current study also applied to clinicians employed in alternative healthcare business models such as medical tourism. Telemedicine has also influenced state of the art technologies such as robotics.

From recent studies, the combination of robotics and telemedicine has been achieving clinical outcomes. In their research, Bettinelli, Lei, Beane, Mackey, and Liesching (2015), while assessing the nurse-physician satisfaction of robotic telepresence (RTP) during night rounds, observed that the unit performed satisfactorily in a hospital setting. When a physician was not physically present in the evenings, RTP substituted the traditional telephone rounds, providing care decisions for the patients with the assistance of a nurse and resident doctor. In another study, physicians used RTP to perform stroke care for patients and reached gold standards in accomplishing medical outcomes (O'Carroll, Hentz, Aguilar, & Demaerschalk, 2015). Although a physician's actual

presence is often preferred, RTP is a good substitute in places where a physician is not available. A study of RTP applied in trauma intensive care units offered advantages and teamwork competencies (Lazzara et al., 2015). By critically comparing the clinical outcomes of the combined technology of robotics and telemedicine, the results varied from high performing to an acceptable substitute; it is important to note that resident physicians, nurses, and other medical team members were involved in these assessments. Therefore, the current study of exploring strategies for technology acceptance of the clinician in specific is of value to the telemedicine healthcare business.

When equipped with current and cutting-edge Internet technologies, telemedicine can extend medical professionals' reach and capability to treat behavioral and medical conditions effectively. Robinson, Branham, Locklear, Robertson, and Gridley (2016) observed that patients and clinicians had a positive experience using the FaceTime app on an iPad to do virtual visits for uncontrolled diabetes. The study presented an example of treatment via video teleconference using current mobile devices and software available to the general public. Additionally, in another application of telemedicine, a virtual-world-based technology (Second Life) was used to encourage positive behavior in cardiac patients to make positive lifestyle choices (Brewer et al., 2015). Patients accessed the virtual world online and experienced virtual tours of grocery stores, restaurants, and fitness centers that promoted healthy living. Yuan, Ma, Kanthawala, and Peng (2015) also studied healthy lifestyles through fitness applications in mobile devices to provide insight into user experience and technology adoption. Through the Internet, these technologies have become ubiquitous and can transcend geographic limitations.

Benefits of Telemedicine Programs in Rural Communities

Distance from large healthcare centers is an inherent problem in rural communities; telemedicine can address this gap in service availability that is limited by the distance factors. Wang et al. (2016) asserted that there are significant benefits to connecting main hospitals hubs and rural health facilities–extending healthcare services availability in remote areas. A link between multiple institutions effectively uses resources and capabilities benefiting those involved.

Rural communities have the most to gain in telemedicine due to cost advantages. In rural areas, the cost of providing care is higher than in urban areas due to the distance from large healthcare centers, and so the cost savings are more profound (Menon, Stapleton, McVeigh, & Rabinowitz, 2015; Vaughn et al., 2015; Wang et al., 2016). Patients do not need to commute to urban medical centers, significantly reducing the travel cost to get medical attention. Sorwar, Rahamn, Uddin, and Hoque (2016) studied rural telemedicine services in remote areas of Bangladesh and reported a reduction of travel time and commuting cost by 56% to 94% on average, as compared to conventional ways to get to service sites. Also, recent advances in telemedicine technology have allowed for treatment in the home setting through downloadable software applications for cellphones, tablets, desktops, and laptop computers (Vyas et al., 2018). Treatment of common illnesses using home devices and Internet technology has become possible through online urgent care services, eliminating the necessity of going to walk-in healthcare clinics; the availability of the telemedicine through the Internet no longer limits treatment by location (specific clinics or hospitals). This model of service delivery

provides cost savings in transportation. The technology also provides added benefits of expanding services unavailable in remote hospitals or clinics.

Telemedicine can extend services from urban hospitals to rural healthcare facilities by augmenting services. In Japan, a pharmacy-based telehealth consultation service has provided care to rural municipalities and to diverse age groups; in the study, the implementation of telepharmacy was feasible and had a high satisfaction rating among patients (Shimoda et al., 2015). The pharmacists from the main healthcare facilities extended drug consultation services to rural clinics. Fairchild, Ferng-Kuo, Laws, Rahmouni, and Hardesty (2019) examined rural emergency departments of four Midwestern critical access hospitals that implemented telehealth; the hospitals performed telemedicine-based care and achieved outcomes of decreased wait times and lengths of stay. The support of the main access hospital providing telehealth augmented their services, achieving positive clinical results. Tele-ICU and Robotic Telepresence can expand services available in rural hospitals and clinics (Bettinelli et al., 2015; Ward et al., 2015). Tele-ICU, a remote intensive care unit support and robotic telepresence, brings the expertise of medical professionals to remote sites; patients can speak to healthcare providers directly in real-time through a secured communication medium. Extension of hospital services using telemedicine to remote rural areas and achieving clinical outcomes provides the necessary support to clinicians in these areas.

Another benefit of telehealth to rural and remote areas is its effect on clinical outcomes. Ferreira, O'Mahony, Oliani, Araujo, and Costa (2015) recognized the lack of specialized clinicians in remote regions by analyzing the clinical usefulness of

teleultrasonography in these isolated areas. The use of teleultrasonography gives local doctors access to expensive diagnostic imaging capabilities, helping them diagnose accurately and thereby reducing unnecessary surgery. Fairchild et al. (2019) investigated emergency department efficiencies and found that the use of telehealth-based care delivery decreases emergency room wait times. The authors compared and analyzed telehealth and nontelehealth visits in the emergency department in these clinics and found evidence of decreased wait times. In another study, the use of telemedicine in a North Dakota emergency department benefited trauma patients by reducing their length of stay in the rural hospital and expedited their transfer to another hospital if needed (Mohr et al., 2018). The use of telehealth consultations in rural locations has helped achieve clinical outcomes and improve efficiencies where access to healthcare and specialists is challenging; clinical outcomes in the current study affects the perception of clinicians.

Remote training and support to both clinicians and patients can improve telemedicine service delivery. Brisson, Steinmetz, Oleskevich, Lewis, and Reid (2015), in their study to compare in-person to remote telemedicine training, found no significant difference between the two methods; in the study, nurses were trained remotely on ultrasound techniques in rural healthcare centers. The authors presented that telemedicine capability is not limited to diagnostic purposes, but also can be used as a training tool to improve the quality of the service; remote training can substitute on-location trainers with remote online training from other locations, reducing costs and increasing efficiency. Also, Locke et al. (2019) demonstrated the use of video telehealth in training patients with obstructive lung disease; the authors found that video telehealth presented as a

promising program that improved the use of inhalers by patients in the research. In the study, real-time remote trainer interaction benefited and enhanced the lives of the patients. Using telemedicine as a training tool has a synergistic effect in improving services and potentially increases the favorable perception of end users.

Rural communities face unique challenges of lacking medical specialists; rural physicians are likely to use technologies that would assist them in their practice. In their study, Ray, Demirci, Bogen, Mehrotra, and Miller (2015) described the lack of specialty care in rural communities, pediatricians in these remote areas prefer to have specialist support and communication with other care partners. Access to specialists through telemedicine gives rural doctors vital support in specific fields and provides a more accurate diagnosis. Jetty, Moore, Coffman, Petterson, and Bazemore (2018), in their research, found that rural family physicians were more apt to use technologies such as telehealth and telemedicine due to challenges they face in their community. The lack of specialists and a limited number of general practitioners in small towns creates a challenging situation for maintaining public health. Ferreira et al. (2015) posited that technologies such as teleultrasound could enable the early detection of problems with an accurate diagnosis, therefore improving the chance of preventative treatment plans. Reliable assistive technologies such as telemedicine enhance the perception of clinicians and patients alike.

Hospitals with overburdened emergency services benefit from teleconsultation by reducing nonemergency visits. Simon (2015) reported that immediate consultation needs by some patients that are suitable for planned consultation often go to emergency care,

contributing to 80% of false emergencies. The unplanned and nonurgent cases congest emergency rooms and overextend emergency personnel. Brunett et al. (2015) claimed that teleconsultation or online urgent care visits could relieve overcrowding in emergency departments; in their study, real-time online primary and urgent care visits were feasible and potentially beneficial to hospitals and clinics. Teleconsultation can address the immediate needs of patients through online healthcare service, reducing the need to go to the emergency departments of hospitals to receive unplanned but urgent care. Improving hospital services that are weighed down by patient crowding through technology can give a positive perception for clinicians.

In recent studies, recipients of telemedicine services, especially those living in rural areas, have shown a favorable view toward the technology. Bashiri, Greenfield, and Oliveto (2016), in their study of patients that need follow up visits for neurological care in Arkansas, observed that clients that have challenges with transportation and those living in remote regions particularly favor telemedicine services. The teleneurology service provides added convenience to those who have challenges in coming to outpatient clinics and face financial difficulty in traveling. A similar study used real-time, two-way video conferencing to treat patients with cancer predisposition by using genetic evaluation testing had high satisfaction ratings with favorable cognitive responses (Bradbury et al., 2016). A community center was the site used in a low access area. In another study, Espinoza et al. (2016) reported the use of telemedicine by emergency responders transporting home-bound patients with chronic conditions. The researchers concluded, based on the results of their survey of 642 respondents, that patients and

caregivers had a favorable view of the program. Therefore, perception of the care recipients is vital to the overall acceptance of the technology; the needs and demands of patients create opportunity for business.

The need for health services in remote areas presents a valid business case to develop telemedicine programs and to examine barriers that impede its growth. In a study by Lambert, Gale, Hartley, Croll, and Hansen (2016), the researchers gathered that the demand for telemental health in rural areas has continued to persist for the last 40 years. The researchers added that mental health was one of the first healthcare services to use telehealth. New technologies have rectified some technical challenges of the past, but due to the slow growth of the telemedicine, the industry needs further examination of other factors. Barriers need to be identified to ensure the success of the programs. The current study examined other obstacles such as clinician acceptance of the technology and explored strategies that may help promote the telemedicine industry's growth.

The Barriers of Technology Acceptance in Telemedicine

The literature has presented an extensive discourse on the challenges of technology acceptance in telemedicine. In recent studies, acceptance and adoption of telemedicine technology have generated various research and discussion on barriers that prevent its widespread use; articles on obstacles to telemedicine adoption have varied, from the clinician and patient interaction with the technology to reimbursements of physicians to public policy and awareness (Jetty et al., 2018; Kruse, 2016; Vaughn et al., 2015). Olatunji (2015) proposed that negative clinician perceptions toward telemedicine are significant barriers toward the acceptance of the technology. Consequently, clinicians

forming negative attitudes toward the technology can affect its widespread use in the medical community.

Technical problems affect the expectation of clinicians using the technology. Hennemann, Beutel, and Zwerenz (2017) and Jinka and Venugopal (2015) posited that *performance expectancy* is a significant determinant of telemedicine acceptance. Clinicians' expectation on how the technology should perform can negatively impact their perception. Disruptions caused by unreliable technology or changes that affect operations can reduce the trust of clinicians (Van Velsen et al., 2016). Outages that affect operations can put the technology in a negative light due to patient outcomes that clinicians need to meet. According to L. Liu et al. (2015) and Bashshur et al. (2016), when the technology satisfies patient outcomes, the conditions become more favorable for acceptance and adoption. The clinician's ability to assess and troubleshoot system problems can be a mitigating factor to prevent disruptions.

The availability and reliability of telecommunications affect telemedicine services. Malcolm and Maurice (2015) investigated telehealth services using 3G wireless mobile communication in rural KwaZulu-Natal, and they found that insufficient signal coverage severely impacted the transmission of data. Depending on the type of data to be transmitted, there are varying bandwidth requirements to conduct a successful communication session. The researchers added that in some remote areas, mobile services were not available because they did not have the infrastructure present. Lambert et al. (2016) posited that infrastructure is particularly challenging due to the capital investment required. The lack of telecommunication infrastructure capacity presents a

significant barrier to telemedicine progress. Capital investments and institutional policies can support or impede program development.

Institutional restrictions also impact technology adoption (Elbanna & Linderoth, 2015). Some institutions do not promote an environment conducive to telemedicine acceptance and adoption. Villalba-Mora, Casas, Lupiañez-Villanueva, and Maghiros (2015) identified financing as a barrier to the adoption of the technology. The lack of funding and budget can reduce training opportunities and support of telemedicine initiatives. Policy alignment also contributes to the growth of the program by supporting technology initiatives in healthcare (Wade, Taylor, Kidd, & Carati, 2016). The support of the institution can advance the cause of providing access and quality healthcare to the community. Support systems can also come in the form training and technical support.

The lack of data to perform a cost analysis to run a telemedicine program and the impact on health economics of the institution and the patients has presented a barrier to the development of telemedicine. Frederix, Vanhees, Dendale, and Goetschalckx (2015) performed a literature review to analyze a cost-benefit analysis on telerehabilitation programs and found that most literature does not contain this information. To effectively sustain a business, hidden costs must be considered to prevent cost overruns in implementation. As was the case in the study by Al Quran, Khader, Ellauzi, and Shdaifat (2015) reported clinical improvements and claimed it was a cost-effective real-time teledermatology, but warned of caution of interpretation due to the lack of comparison to conventional treatment. In another article, Yoo, Kim, Sasaki, Hoch, and Marcin (2018) advised of potential cost savings in their tele-ICU program, but were limited to certain

high-risk patients; their break-even analysis recommended overall cost reduction in ICU medical expenses. Telemedicine program leaders must collect data for a cost analysis to make informed decisions to determine economic efficiencies. Finally, Lambert et al. (2016), in a telemental health exploratory study, emphasized that funding and reimbursement is a crucial aspect of a successful telemedicine program. Technology feasibility and support systems alone do not dictate the success of a rural healthcare delivery systems–the business aspect of the program must be considered as well.

Hospital administrators' and clinicians' perceived malpractice concerns on the use of telemedicine have been prevalent in the industry. Cooper (2015) performed a literature review on telehealth in the Midwestern region of the United States; the researcher focused on the hospital administrator's opinions and how it influenced the adoption of telemedicine. The author found that malpractice concerns were one of the primary obstacles they faced. Simon (2015) claimed that the risk of medical malpractice on telemedicine is no higher than in-clinic consultations for general practitioners that know the patient's medical file, although the risk of medical malpractice is higher for doctors that treat new patients. The perceptions of doctors and hospital administrators present a challenge to telemedicine leaders in acceptance of the technology.

The limited knowledge of the benefits of telemedicine technology and lack of training has propagated negative perceptions (Ayatollahi, Sarabi, & Langarizadeh, 2015; Becevic, Clarke, et al., 2015). Lack of education about the technology can reduce interest in the telemedicine program. Hennemann et al. (2017) also supported the idea that health professional training and education promotes the usage of the technology and leads to

health professionals recommending the product to their peers. The lack of knowledge of the capabilities of telemedicine can reduce interest in the technology and clinicians who are settled in old practices. In some situations, the lack of interest and participation of clinical professionals causes delays in adoption and compromises the potential success of the program (Boudreaux, Haskins, Harralson, & Bernstein, 2015). The engagement and active involvement of stakeholders are critical to the success of the programs.

Clinician acceptance can affect opportunities to improve an institutions ability to extend service delivery. In an article by Ly, Kristjansson, Labonté, and Bourgeault (2018), the authors asserted that most doctors populate large hospitals, leading to unequal access to healthcare. The lack of participation by physicians in telemedicine programs perpetuates the problem of limited access to healthcare in some areas. Taylor et al. (2015) and Wade et al. (2016) posited that stakeholders' endorsement, especially the clinicians, helps transition from a pilot to large-scale deployment and is critical to successful implementations. The participation of most physicians in the telemedicine programs can extend a medical institution's capabilities to serve other institutions.

Strategies for Clinician Acceptance and Adoption of Contemporary Technology

The acceptance and adoption of contemporary technology require changes to user perception. From recent studies in technology acceptance in healthcare, the perception of users of the technology has been the subject of inquiry by researchers (de Souza et al., 2017; Driessen et al., 2018; Jetty et al., 2018; Mammen et al., 2018; Ray et al., 2017). In this study, the focus was on clinicians, but patient perception also indirectly influences the perception of healthcare professionals. Segrelles-Calvo, Chiner, and Fernández-

Fabrellas (2015) proposed that the primary determinant for telemedicine technology diffusion is healthcare professionals. The subjects of the research often included healthcare providers, such as physicians, nurses, support staff, and patients; these individuals are users of the technology, whether they are the operators of the technology or the one receiving the care. The TAM uses constructs that deal specifically with perception to address the problem of acceptance (Fathema, Shannon, & Ross, 2015). For users to receive and adopt the contemporary technology, researchers should consider the PU and PEU constructs to develop a strategy.

Overcoming the technical problems, usability, and system integration can improve technology usage. Mammen et al. (2018) indicated that rectification of technical difficulties could reduce negative perceptions with the technology. Identifying and fixing technical problems that impede the use of the technology can improve use. Narasimha et al. (2017) and Vo et al. (2015) proposed that system designers should consider the usability of the technology based on the characteristics and attributes of its users. The intuitiveness of the system helps users become comfortable with the controls to use the system. Vo et al. (2015) stated that integrated systems help users access information and improve healthcare delivery. System integration, as opposed to disparate systems, raises the efficiency and effectiveness of the clinical process. Solving problems related to technical challenges, usability, and system integration can positively affect perceived ease of use for operators and end users. Training can also contribute to the effectiveness of overcoming these problems.

Training can reduce the difficulties of implementation and decrease the barriers associated with usage. Recent studies have suggested the lack of education in healthcare technology can adversely impact implementation and increase the negative perception of the technology (Ayatollahi et al., 2015; Becevic, Boren, Mutrux, Shah, & Banerjee, 2015; Becevic, Clarke, et al., 2015; Kruse et al., 2016). Other literature also has indicated that training must be available to users that need it. Kuo, Talley, Lee, and Yen (2015), in their research, emphasized that inexperienced physicians must have adequate attention to improve intention to adopt telemedicine. Training affects two constructs, PU and PEU; training can increase the user's awareness of the uses of the system, and familiarity of the system can introduce the user to effective practices of operation.

The availability of electronic training devices and medical software applications encourages future usage. Galappatthy et al. (2017) evaluated the usage of portable electronic devices and medical applications by medical students in Sri Lanka to promote future usage of technology; the researchers found that the key determinant was the availability of these devices. Exposure to these medical apps and portable electronic devices encourage use of technology due to the user's familiarity with the devices. Segrelles-Calvo et al. (2015) concluded that improving specific computer skills and training programs enhance the perception of telemedicine usefulness.

For some telemedicine programs, a reliable end-to-end Internet connection with adequate technical support can ensure a positive experience of end users of the technology. Locke et al. (2019) indicated that having a good Internet service is crucial with technology that has higher bandwidth requirements; sufficient technical support to

guarantee its proper functioning and user experience is also essential. Telemedicine programs must ensure technical specifications have been satisfied to avoid connection interruptions, which disrupts the session between the healthcare provider and patients. Real-time online urgent care has been gaining popularity among patients, which has been proven to be safe and convenient; more and more people of various age groups are relying upon Internet-based technologies, revealing the need for robust Internet service with minimal technical difficulties (Brunett et al., 2015). As technologies continue to advance in the healthcare arena, dependence in computing and Internet technology is apparent, and consumers have higher expectations on the stability of these services. The availability of high-speed Internet in some places, particularly in rural areas, continues to present as a challenge to the telemedicine industry, but there are options available.

Telemedicine leaders can leverage the increased availability of mobile technologies in rural communities to reach underserved areas. Rothstein et al. (2016) researched the use of mobile apps of frontline health workers in Ghana to track patients and to deliver e-health information. The prevalence of mobile communications around the world reaches even the most remote areas, as is the case in Ghana; although high-speed Internet service is not available, mobile data communication can transmit clinical data and access online medical information. Sáenz, Novoa, Correal, and Eapen (2018) assessed the reliability of mobile dermatological software applications used in medically deprived areas that are not easily accessible in Colombia; the study results were promising although the sample size was small. For some telemedicine specialties such as

dermatology, even low bandwidth connections such as mobile data are enough to relay pictures that specialists can use to diagnose patients and create a treatment plan.

The use of teletraining to instruct clinicians and patients in rural communities increases telemedicine technology satisfaction and acceptance. Pandit, Ray, and Sabesan (2018) researched the feasibility of teletraining in rural North Queensland and produced successful results. The same technology platform for treating patients has broader uses, such as teletraining for rural doctors and emergency specialists; the authors suggested that teletraining should be part of the core business and a mainstay for medical training institutions. In a similar application of technology, Locke et al. (2019) employed video telehealth to train rural patients with obstructive lung disease on how to use telehealth inhalers. According to the authors, the patient training by the remote pharmacist was well received and is a promising modality. Implementation of a telemedicine training program should be well designed to ensure the success of the program.

A customized telemedicine training curriculum, designed mainly for the clinicians and healthcare workers that address barriers associated with interpersonal communication over video teleconference, can potentially increase positive perception of the technology. Randall et al. (2016) explored the benefits of training curriculum customization to address interpersonal barriers that exist during telehealth sessions. Telemedicine and telehealth training should incorporate an interpersonal communication component as part of their training regime to increase the effectiveness of the patient and clinician communication resulting in a better perception of the technology. Systems should also be customizable to meet patient needs.

Customization of the telemedicine system according to the end-user of the technology can also promote acceptance. Hossain, Yokota, Sultana, and Ahmed (2018) studied end-user acceptance in a rural community in Bangladesh; they found that relevancy of the technology to the user was vital to promoting acceptance. Equipment and system designers should include culturally appropriate systems that allow some customization. Czaja (2016) emphasized the importance of personalization, particularly for the aging population; patients in these categories can find it challenging to use the technology.

The cost of technology investments should be analyzed carefully by program leaders and should be designed appropriately to ensure the affordability and viability of the telemedicine program. Takumi et al. (2019) conducted a study to analyze the cost-efficiency of system installation of a teleradiology system to reduce the financial burden to the healthcare facility in Hokkaido prefecture Japan. The authors' analysis provided a more cost-effective placement that covered a broader geographic location and increased the utility of the expensive equipment. Also, the authors reasoned that reducing implementation and maintenance expenses limited passing the costs to the patients, making it more affordable and acceptable. In similar research, Yoo et al. (2018) analyzed tele-ICU in four hospitals to explore potential cost savings; the authors found that high-risk patients had the most optimal cost-effectiveness ratio. Based on the research, patients with higher risk conditions had better health outcomes per dollar. The success of the telemedicine programs increases positive perception from clinicians and patients.

The establishment of guidelines, performance, and evaluation framework should be part of the implementation of a telemedicine program. Segrelles-Calvo et al. (2015) identified factors that contributed to the success of a respiratory therapy telemedicine program. They concluded that clinician acceptance was related to the establishment of defined guidelines and performance standards. Healthcare professionals are concerned about clinical outcomes; if the technology meets the desired results, clinician acceptance is possible. According to Chang (2015), the need to develop a comprehensive evaluation framework for telemedicine is vital; the author concluded that quality and safety measures are important indicators of a good evaluation system. In relation to the current study, it was important to identify assessment methods and performance standards used by the participants as part of the data analysis to further validate the participant's responses to the interview questions.

Transition

Section 1 started with a background of the problem followed by the problem statement, purpose statement, research questions, nature of the study, and conceptual framework. This section also included assumptions and limitations of the study, followed by the study's significance. At the end of this section, a literature review contained extensive information on early and current research about the TAM framework, the state of telemedicine, and contemporary strategies used in the industry.

Section 2 begins with the role of the researcher and participants of the study, followed by an in-depth analysis of the research method and design. This section also includes the population and sampling approach, ethical research, data collection

instruments and technique, and information about data organizational technique and analysis. Reliability and validity conclude the section and transitions to Section 3.

Section 3 opens with the findings of the study. The section includes the following elements: application to professional practice, implications for social changes, recommendations for action and further research, reflections, and conclusion. In essence, the last section of the study constitutes the summary and discussion of the results.

Section 2: The Project

The review of the professional literature affirmed the general business problem of how clinicians, who are challenged by technology and have a high resistance to change, create barriers to the successful adoption of a telemedicine program. The literature review also presented information on how some telemedicine program leaders lack the strategies to gain clinicians' acceptance of contemporary technology in rural communities.

This section contains narratives on the role of the researcher and participants, an expanded view of the method and design, details on population, sampling, ethical research, and the methods for data collection and organization. Finally, it includes data analysis, reliability, and validity.

Purpose Statement

The purpose of this qualitative descriptive case study was to explore strategies telemedicine program leaders use to gain clinicians' acceptance of contemporary technology in rural communities. The target population consisted of five leaders in clinics within a telemedicine program located in the Marianas Islands, who had successfully used strategies to gain clinicians' acceptance of contemporary technology. The contribution to positive social change includes improved access to specialized healthcare for underserved populations in rural communities.

Role of the Researcher

As a principal investigator, my role in this study was to analyze information collected from research subjects in an ethical and professional manner that met academic standards. According to Boddy (2016), the purpose of qualitative research is to explore

the experiences, values, and behaviors of subjects through meaningful samples of data. I was committed to conducting research that would provide a depth of understanding in the analysis of data gathered. However, collection and interpretation of data is the not the only objective; the protection of research subjects is also a primary concern. The Belmont Report provided ethical practices in human research, which exemplified guiding principles such as respect for persons, beneficence, and justice for the benefit of the research subjects and the research community (U.S. Department of Health and Human Services, 2014). In this study, I adhered to these standards to ensure the participants' confidentiality and their full understanding of the crucial aspects of the research to gain informed consent to conduct interviews.

I used an interview protocol when conducting interviews; potentially, personal perspectives can influence data collection and results, thus the importance of steps to mitigate bias. Bryman and Bell (2015) stated that carefully crafted interview questions could help reduce bias. I asked six open-ended questions based on the literature review. As needed, I conducted member checking and follow-up interviews. According to Boyle and Schimierback (2015), the researcher's behavior and action can introduce bias and possibly affect the data collection process and results. In an interview process, the body language of the interviewer can unintentionally express opinions, hence the importance of preplanning and a carefully prepared interview script before the meeting. Aside from biases that may exist on a personal level, conflict of interest was also a critical aspect of research.

In my role as a researcher, I worked to identify strategies telemedicine program leaders used in their organization to gain clinicians' acceptance and to ensure there was no potential conflict of interest in terms of organizational affiliations. I had no working relationships or associations with any of the participants of the study. Although I have memberships to associations that promote the telemedicine industry, such as the American Telemedicine Association, these organizations do not have any direct relationship with the participants' organizations.

Participants

The eligibility criteria for the research participants were that they needed to be leaders of a telemedicine program in a rural location who make strategic, operational decisions on behalf of clinicians. I used a purposeful sampling method, a pragmatic approach to selecting cases that embody the researched phenomenon (see Benoot, Hannes, & Bilsen, 2016). Through purposeful sampling, the researcher can also influence the choice of participants that have vast experience and extensive knowledge about the phenomenon in a specific area of study (Ladhari & Tchetgna, 2015). With this in mind, I used the purposeful sampling method to select participants with particular professional roles and attributes. Identifying participants in the study involved contextual and specific organizational roles that influence clinicians concerning the use of a particular technology; the use of purposeful sampling was appropriate in this distinct study. To access potential participants, I used contacts from members of the American Telemedicine Association Pacific Islands Chapter, a professional organization that promotes the effectiveness of telemedicine in the Pacific Islands. I became a member of

the American Telemedicine Association from working on a telemedicine and distance education grant made available by the U.S. Department of Agriculture. With the selection of subjects, I employed strategies on how to maintain a working relationship to obtain the necessary data.

Strategies in planning and preparation ensured integrity in data collection and establish a good rapport with participants. Preparing a consent form ensured subjects that their participation was voluntary, with the knowledge that they could withdraw at any time, while an interview protocol stimulated conversations that aligned with the research question. Interaction with study participants and listening to them share their professional experience and expertise developed a working relationship that was invaluable to study (see Marshall & Rossman, 2016). Finally, securing collected data remains essential even after the study concluded.

Research Method

I used a qualitative research method with a descriptive case study design to explore the strategies telemedicine program leaders use to gain clinicians' acceptance of contemporary technology in rural communities. Alderfer and Sood (2016) advocated that qualitative methods improve clinical care practices by providing in-depth information on the experience of subjects. Telemedicine program leaders' experiences can contribute to the development of practices and can enrich the study, making the qualitative method the appropriate choice. The quantitative method, using numerical analysis, cannot yield the depth of understanding provided by experiences.

The quantitative and mixed-methods were not suitable for the study based on their approach to research. In quantitative methods, numerical data is used to explain a phenomenon, and the quality and accuracy of the raw data are critical to the study (McCusker & Gunaydin, 2015). The quantitative method was not appropriate for the study because the analysis of statistical data was not suitable for the research. The mixed-methods approach is used to explore a complex phenomenon, using both qualitative and quantitative data (Halcomb & Hickman, 2015; McCusker & Gunaydin, 2015). Although the mixed-methods approach uses a qualitative research component, the quantitative method portion was not appropriate for the study. Ridder (2017) noted that quantitative and mixed-methods use variables to describe relationships between these constructs. These approaches were not suitable because I did not examine the relationships between variables.

Research Design

From other designs available, I selected the descriptive case study design for the study. The case study design allows a researcher to focus on a case that presents evidence of a complex social practice from a real-world environment (Yin, 2018). A descriptive case study allowed me to concentrate on telemedicine programs where leaders of the organization had applied strategies to influence clinicians' acceptance of their contemporary technology. In rural communities, the availability of telemedicine programs is limited. Hence, the multiple case study design was impractical in exploring the diversity of telemedicine program leaders' responses and may have impeded the progress of the research if there was only a small number of participants available.

Internal or external sources of information with good descriptions can provide a rich explanation of a phenomenon. Mojtahed, Nunes, Martins, and Peng (2014) denoted that semistructured qualitative interviews used as the primary source with other sources of data can provide insight into the phenomenon studied. The interviews of telemedicine program leaders as a primary source involved the exploration of other sources of data to support the evidence. Yin (2018) posited that other sources of data may include: direct and participant observations, archival records, and physical artifacts. Different designs have varying sources of data and research intent.

Despite the selection of the case study design, careful considerations of other designs, such as narrative, phenomenology, and ethnography, were brought to bear. In a narrative design, events and stories in the life of the subjects are the focus of inquiry (Lewis, 2015; Marshall & Rossman, 2016). The narrative design was not appropriate for the study because I did not collect data from sources such as journals, stories, or life experiences; the sources selected for this research were interviews and other observations and artifacts. According to De Felice and Janesick (2015) and Marshall and Rossman (2016), in a phenomenological design, the focus is on a phenomenon and exploring the meaning of the lived experience of the subject; also, only a single source can be the reference of the study. The phenomenological design was not appropriate because the interpretation of meanings of the lived experiences of specific individuals is not compatible with the exploration of complex social practices, which may involve a collection of multiple types of data sources. Crandall et al. (2016) described the ethnographic design as the observation of a shared culture of a group in an extended

period. The exploration of strategies of program leaders did not involve cultural aspects, but rather centered on particular practices in a given environment.

Ensuring data saturation is a critical concern in qualitative studies. Data saturation involves the thorough sampling of data to form themes; once new information to form themes is exhausted, the collection of information is concluded (Fusch & Ness, 2015; Tran, Porcher, Falissard, & Ravaud, 2016). I interviewed five leaders in a telemedicine program in the Marianas Islands until no new information and themes emerged.

Population and Sampling

The population for this study consisted of five program leaders at clinics actively working in a telemedicine program in the Marianas Islands. The purposeful sampling method is used to explore and select specific cases that exhibit complexity and depth of a conceptual phenomenon (Benoot et al., 2016). I used purposeful sampling method for the study. Purposeful sampling also offers the researcher the opportunity to obtain various perspectives by selecting local experts with diverse background (Onwuegbuzie & Hitchcock, 2017). Therefore, the participants were selected based on their professional role, experience, and the contextual situation in the area of telemedicine in the Marianas. The number of participants and data saturation were also critical aspects of the research.

According to Boddy (2016), in qualitative research, the sample size of a study is dependent upon the context and scientific paradigm. In the Marianas Islands, there were only three programs offering telemedicine services at the time of the study. The study was dependent on available clinics and the personnel that staff these facilities; the lack of availability of these services is characteristic of rural communities. Although more data is

ideal to have a broader understanding of a specific phenomenon and to demonstrate rigor, achieving data saturation with a small sample size is possible by exhausting relevant conceptual categories (Hennink, Kaiser, & Marconi, 2017). In this study, I used the interview method to achieve data saturation. The collection of data from multiple participants, using the same interview questions, created the opportunity to exhaust available information until a point was reached where no new data appeared. Selecting appropriate participants for the study ensured the data collected was rich in content.

The participant's role in the organization was a critical criterion and level of involvement with the telemedicine technology. Current research has shown that program leaders can influence telemedicine adoption (Cooper, 2015). Program leaders included hospital administrators, health services administrators, physician administrators, the Department of Public Health and Human Services healthcare administrator, the program manager, clinic administrators, the nursing home administrator, the health information manager, the healthcare program director, and the consulting healthcare administrator. These roles can influence clinicians from an operational standpoint, can provide strategic direction, and can encourage adoption of innovative contemporary technology. The population did not include nurses, nurse assistants, laboratory technicians, or telemedicine technicians; their roles are considered to be clinical.

Ethical Research

Following institutional review board (IRB) standards and procedures, the selection and ethical protection of participants and data collection was subject to Walden University's purview and approval. Oye, Sorensen, and Glasdam (2016) emphasized that

the research study must be in alignment with the IRB and must achieve adequate protection of confidential information. The express permission of Walden University's IRB was required to initiate the collection of data (approval number 12-06-19-0515114). On the data collection process, I ensured that the protection of confidential information collected from the selected subjects is in place. A coding system was applied to protect the subject personal information and affiliation to any organizations. The collected data was also handled according to university standards.

The storage and disposal of collected data ensures the proper handling of information and further protection of subject. The electronic data is stored and encrypted on an external hard drive for 5 years. Also, a locked safe with sole access to the research holds the device and any printed information that is related to the study. After 5 years, I will use a Macintosh application such as Clean My Mac to erase any sensitive data securely from the hard drive prior to discarding the device; for printed information, I used a crosscut shredder to destroy any identifying information to protect the confidentiality of the participants. After procedures for collection and retention were in place, I proceeded with the participant's informed consent process.

I sent the participants an informed consent letter indicating the details of the study. The letter was sent via email. The letter outlined and explained the purpose of the study, the risks and benefits, the interview procedures, privacy, and contact information. Also, I included information about incentives for participating and procedures for withdrawing from the study. Oye et al. (2016) recommended the recruitment of participants should be free of enticement and done on a voluntary basis. I did not provide

any incentives for participation. The consent form also gave the subjects the option to leave the study at any time (see Tam et al., 2015). Before the commencement of the interviews and collection of data, I required each prospective participant's acknowledgment that they had read, agreed to, and signed the consent form.

Data Collection Instruments

As the researcher and interviewer, I was the primary data collection instrument. Merriam and Tisdell (2016) indicated that it is the researcher's responsibility to connect theoretical understanding with the empirical findings through the subjects' accounts. I conducted a semistructured interview to gather data on the strategies telemedicine program leaders used to gain clinician acceptance of contemporary technology. Semistructured interviews can provide valuable insight and a depth of understanding of a participant's perceptions and experiences (Jacobson, Wasserman, Wu, & Lauer, 2015; Rosenthal, 2016). A detailed process was also put in place to methodically collect the information.

I used an interview protocol and instruments to capture the data. Interview guidelines and protocols mitigate ambiguity in the interview process (Rosenthal, 2016). The interview participant recruitment solicited telemedicine program leaders in the Marianas Islands. An identification code was given to protect participant confidentiality throughout the collection and analysis phase. I carefully followed the planned interview protocol (Appendix A) and asked the subjects six open-ended interview questions (Appendix B) using a digital audio recorder to capture the data provided by the participants. Rosenthal (2016) emphasized that to identify essential themes, the data

collected from the interview must go through transcription and analysis. The interview was the primary data source; secondary sources were company documents. I used NVivo (Version 12), a software used for qualitative and mixed-methods data, to perform data analysis.

I used varied data sources to perform data triangulation to ensure construct validity. Hussein (2015) described triangulation as the use of multiple approaches to study a phenomenon. I used various data sources to increase the credibility of the study. Also, Fusch and Ness (2015) defined data triangulation as the use of different types of evidence that is rich in data to form a comprehensive assessment. Diverse sources of data also gave opportunities for different perspectives. The reliability of data was also a crucial aspect of data integrity.

I used an integrative approach to ensure validity and reliability of data by identifying research bias and using member checking. Boddy (2016) posited that to ensure the integrity of the data, recognizing and managing personal biases of the researcher must be guarded during the data collection and analysis phase. The researcher identifying biases alone is not sufficient to establish credibility. Study participants must have the opportunity to review the accuracy of the collected data and comment on the findings. Birt, Scott, Cavers, Campbell, and Walter (2016) used member checking to validate interview transcripts or interpreted data by having the participants review gathered records. I returned the collected data from the interviews of telemedicine program leaders to allow them the opportunity to check for accuracy of statements. Also, Harvey (2015) claimed that member checking improves the credibility of the data

collection process by having the participant acknowledge what the researcher has recorded or interpreted, increasing the truthfulness of responses. Therefore, I used member checking to ensure validity and reliability of the data.

Data Collection Technique

I used participant interviews and company documents as data collection techniques to explore the strategies telemedicine program leaders use to gain clinician acceptance of contemporary technology in rural. I used semistructured interviews with six open-ended interview questions for the study participants (Appendix B). Data from company document includes board briefings, newsletters, and reports made available for public information. Ranney et al. (2015) recommended the use of qualitative interviews because participants perceive it more as a lengthened conversation and are particularly helpful for novice researchers due to its format. Likewise, Harvey (2015) explained that accounts about a phenomenon surface in active dialogues and narratives that create meaning. The disadvantage of the instrument is that some participants may not entirely reveal critical information that could put them in a negative light. Yin (2018) identified interviews as one of the most valuable case study evidence. Therefore, I used the semistructured interview as the primary data source; the instrument's advantage is its dialogue-like format, its simplicity for novice researchers, and its appropriateness to case studies outweigh the disadvantage of possible inaccuracies due to personal reasons of some participants.

Upon approval from the Walden IRB, I established communication to facilitate the informed consent process and the scheduling of the interviews. It was critical that

before any contact with participants, the researcher has express permission from the Walden IRB. With confirmation, I solicited permission from target organizations to conduct the study. I communicated via phone and follow up via email for documentation purposes. Upon approval from selected institutions, I worked with the authorized representative to identify potential participants; I sent the chosen individuals an email explaining the informed consent process and attaching the form requiring the signed consent. Upon the return of the signed consent form, I worked with the subject identified to schedule a time and venue of the interviews. I then strictly follow the interview protocol (Appendix A) during the scheduled appointment. After the collection of the interview data and transcription process, the need for tools to validate the data is necessary.

I applied a method of validation used by researchers in the data collection and analysis process called member checking. Researchers use member checking (also known as respondent validation) as a means to gather feedback from participants to ensure the accuracy of the collected data and fill in overlooked information (Birt et al., 2016; Merriam & Tisdell, 2016; Yin, 2018). I sent the transcribed interviews via email to each participant and made corrections based on the requested edits and will continue the process until the participant acknowledges the transcription is correct.

Data Organization Technique

A system of organizing and protecting information is essential in the data gathering process. Researchers must maintain records to keep track of the data collected; the information should include the time, location, and types of data gathered (Marshall &

Rossman, 2016). I created a research log of all data collected in a Microsoft Excel document on a password-protected computer that is accessed only by the researcher. A folder on the computer was assigned specifically for the study. Yin (2018) emphasized the importance of note taking in a case study research; it is necessary to maintain field notes during data gathering and interview to capture critical details relating to the study. In addition to data types, location, and time stamps, I collected field notes that were scanned and added to the study materials on the computer. Bradley, Getrich, and Hannigan (2015) demonstrated NVivo, a qualitative data coding software with the capability to code text, can identify emergent themes and organize various types of data such as PDF, audio, and images. I used the software package to input the transcript of interviews and other relevant data; a participant code substituted the participant's real name on the software program. When the study concluded, I provided storage of the raw data.

Following Walden University's IRB criteria on the storage and disposal of related material at the conclusion of the study, I completed the necessary steps to secure research materials and provide appropriate secure storage. I discarded all irrelevant data and scan all hardcopy documents. I digitally stored scanned copies of hardcopy documents, along with transcripts, digital audio recordings, and participant codes in a password-protected external hard drive. I kept the hard drive in a locked safe and ensure the destruction of the information in 5 years from the completion of the study.

Data Analysis

Researchers can use the case study approach to gain in-depth understanding of a phenomenon (Gibson, 2017; Rosenthal, 2016). Through the case study method, I explored the strategies that program leaders used to gain clinicians' acceptance of contemporary technology in rural communities. Yin (2018) stated that the case study method uses how and why questions to invoke responses; what is also an exploratory question used in case studies. I employed open-ended questions that encouraged the study subjects to reveal their experiences, insights, and perspectives of a phenomenon.

I applied a corroborative strategy of analyzing primary and secondary data to triangulate and instill confidence in the data source. Using other data sources and methods to achieve the same findings can provide consistency and confidence in the primary data source (see Gibson, 2017). Also, Archibald (2016) confirmed that data triangulation is a validation or confirmation strategy used in research. I used the company documents as secondary data to verify interview responses and to bridge any gaps in the interview data. With the collected data, I used software to assist in analysis.

I used NVivo software to code and organize the interview data collected to form themes. Zamawe's (2015) NVivo software uses a node organization structure to create codes and identify themes. Furthermore, Houghton et al. (2017) explained that the term 'nodes' is particular to NVivo and is synonymous to 'codes' in the research field, which are also related to themes and subthemes. Using the software, I grouped words and phrases and form themes and save them into nodes. I used the conceptual framework to correlate key themes with the literature.

I selected the technology acceptance model (TAM) as the conceptual framework to organize themes for the study, and to keep my study current, I stayed abreast of new studies published during the duration of the research. The TAM is a flexible framework with a wide range of applications in emerging technologies and suitable in different industries and research fields (Fathema et al., 2015; Marangunić & Granić, 2015). Using the TAM framework can help researchers understand the user acceptance of contemporary technology. I continued to research new studies that related to my research; in particular, I monitored the latest developments in telemedicine in industry-specific publications and newsletters to keep me updated in the most recent advancements.

Reliability and Validity

It is crucial that researchers demonstrate reliability and validity in a qualitative case study. Morse (2015) asserted that to prove reliability and validity, researchers should explain their design decisions, data collection instruments, and research process. Therefore, I have addressed the reliability and validity applicable to a qualitative case study.

Reliability

I used member checking to demonstrate dependability by showing accuracy in data collection, organization, and analysis. Welch and Piekkari (2017) stated that member checking is a process that tests the exactness of a participant's experience. Also, Ranney et al. (2015) described member checking as a dependable and accurate technique found in research literature. Member checking is not just to check precision but to also show clarity in the step-by-step process for other researchers to follow. Hadi and Closs (2016)

stated that dependability follows the premise that other researchers can duplicate the study. The description allowed other researchers to comprehend the process and provided enough detail to replicate the study. I detailed the steps on how I captured and analyzed the data, followed by member checking.

Validity

Credibility. I used data triangulation and member checking to establish credibility. Hussein (2015) emphasized that triangulation is one of the techniques that increases the credibility of research findings. Merriam and Tisdell (2015) attested that credibility could be demonstrated using multiple methods and sources of data; they added that triangulation cross-checks primary sources of data with other data sources. To complement my semistructured interview, I used field notes to supplement gaps that may have emerged from the transcripts. Another technique to enhance credibility is member checking. Member checking gives the researcher the opportunity to gain additional information or to correct data by providing the participant the transcribed interview (Fusch & Ness, 2015; Lewis, 2015; Morse, 2015). Fusch and Ness (2015) accepted that member checking improves data accuracy.

Transferability. In qualitative description research, some of the means to support transferability are purposeful sampling and rich descriptions of the phenomenon (Bradshaw, Atkinson, & Doody, 2017). In essence, transferability is the applicability of the research findings in other fields of study (Noble & Smith, 2015). Likewise, Tran et al. (2016) revealed that purposeful sampling provides the researcher with rich and in-depth answers per participant with smaller sample sizes. Morse (2015) contended that the

researcher must be able to select an information-rich description of the setting and context to attain transferability. I provided a detail-rich account of the participants' experiences in strategies that gain clinicians' acceptance of contemporary technology. Also, I gave a full description of the population to be studied, the context from which they operated, and the geographic boundaries and attributes of the study.

Confirmability. I used member checking and a reflective journal to address confirmability. Bradshaw et al. (2017) presented that member checking is one of the means to support confirmability. Verifying the accuracy of the participants' data precludes biases that may be introduced by the researcher. Moreover, Ibrahim and Edgley (2015) inferred that for a study to be confirmable, it must be unbiased and objective; the researcher's use of a reflective journal through self-reflection can help avoid some of the preconceptions and biases that may occur during the study. I kept a reflexive journal to reveal and prevent preconceived notions and personal biases.

Data saturation. From numerous studies, researchers have agreed that data saturation occurs when information to form new categories or themes is exhausted (Fusch & Ness, 2015; Hennink et al., 2017; McCrae & Purssell, 2016). To achieve data saturation, I obtained five participant interviews, company documents, and analysis with NVivo software. Using multiple data sources helped fill the gaps that may appear in the participant interviews.

Transition and Summary

The purpose of this qualitative descriptive case study was to explore strategies telemedicine program leaders use to gain clinicians' acceptance of contemporary

technology in rural communities. Section 2 contained the highlights of the role of the researcher and participants. It also covered the research method and design, population and sampling, and ethical research. The section continued with the data collection instruments, techniques, and the plan for data organization. The section concluded with data analysis and discussions on reliability and validity. In Section 3, I presented the findings obtained from the actual data collection. I described the themes that emerged and discuss how it relates to the literature. Finally, I made recommendations for telemedicine for program leaders on strategies to gain clinicians' acceptance.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative, descriptive case study was to explore strategies telemedicine program leaders use to gain clinicians' acceptance of contemporary technology in rural communities. The participants of the study included program leaders in medical institutions in the Northern Marianas Islands. The primary data collection method for the case study included face-to-face interviews and one audio teleconference interview. After completion of the interviews, I started the process of transcription and data analysis.

Three themes emerged from the qualitative data analysis using the NVivo software. Upon transcribing the semistructured face-to-face and audio teleconference interviews, I conducted member checking and did not receive new information from the participants' feedback. I imported the data to the NVivo software application. I coded the transcribed data and grouped them as nodes. I triangulated data from interview transcripts (primary data collection source) with publicly available company documents and news articles (secondary data collection sources). The interrelated nodes resulted in common themes, and most showed associations with the conceptual framework used for the study. The findings presented barriers that affect clinicians' acceptance of contemporary technology and strategies to overcome these obstacles.

Presentation of Findings

The overarching research question was the following: What strategies do successful telemedicine program leaders use to gain clinicians' acceptance of

contemporary technology in rural communities? Three themes emerged from the data analysis: (a) utility of technology, (b) usability of technology, and (c) engaging clinicians.

The first and second emergent themes related to the TAM model's PU and PEU, but one unexpected theme surfaced. The theme utility of technology is associated with PU and the theme usability of technology is linked with PEU, which are constructs of TAM. Engaging clinicians was the serendipitous theme and did not appear to be directly related to the original TAM conceptual framework. Also, the theme had 21 unique quotes from four participants. From the data analysis, noteworthy results also appeared.

The result of the data analysis showed prominent emergent themes and strategies. I observed that the most prominent emergent theme was the usability of technology. The usability of technology is characterized by the actual intensity of effort while using technology. The theme had a total of 28 unique quotations (see Table 2). The most noteworthy strategy for convincing clinicians to accept contemporary technology was the strategy of *involvement*. Involvement falls under the third theme, engaging clinicians. As it relates to the study, involvement is the collaborative effort to increase awareness and encourage technology adoption. The strategy had 16 notable quotations. The following sections describe all the themes and strategies generated from the findings.

Table 2

Utility of Technology

Participant	Clinical outcomes	Cost and financial viability	Perceived norms
Participant 1	6	3	
Participant 2	1		2
Participant 3	3	1	3
Participant 4	2		
Participant 5		2	
Total	12	6	5

Theme 1: Utility of Technology

Understanding how clinicians perceive the value or usefulness of the technology appears important for program leaders. The utility of technology pertains to the user's perceived value, which leads to the use of the technology. In Oest, Swanson, Ahmed, and Mohr's (2019) study, they surveyed physicians, physician assistants, and nurse practitioners in hospitals to understand telemedicine services' impact on clinicians' perception. They postulated that influencing user perception could alter the perceived value of a service. With the current research, participant responses reflected these ideas in their strategy to change clinician acceptance. The concepts and findings were also related to the conceptual framework.

The utility of technology theme that emerged from the analysis directly relates to PU in the TAM framework. Davis (1989) introduced the PU as one of TAM's constructs, describing it as the person's belief that a system or technology can improve their work

productivity. Hoque and Bao (2015) described PU as a significant indicator that leads to behavioral intention to use technology. The utility of technology is aligned with the PU concept definition, in which the perception of usefulness and value leads to action. In the current study, participants described three strategies related to the theme of the utility of technology. These three strategies were the following: (a) clinical outcomes, (b) cost and financial viability, (c) accepted norms.

Clinical outcomes. In relation to this study's central research question, clinical outcomes are the clinicians' perceived usefulness to accomplish their clinical and organizational goals. The participants, who were program leaders who managed clinicians, expressed their objectives and reveled what clinicians' aim to achieve. Twelve unique quotes from participants related to this strategy (see Table 2). Participant 1 noted, "I focus a lot on the positive aspects of the technology to accomplish our task to deliver clinical services." Participant 3 emphasized, "I know the importance of integrating technology into our work to meet the people's healthcare needs in the Marianas." Participant 4 asserted, "What clinicians want is for telemedicine to fit the clinical needs and gaps they have." Participant 2 posed, "New tools and technology could provide organizational benefits." Smith, Doarn, Krupinski, McSwain, and Thomas's (2020) study posited that contemporary technology such as telehealth and telemedicine can advance organizational goals of healthcare delivery and clinical outcomes. The findings of this study suggest that technology's potential benefits must have a direct bearing on clinical and institutional needs to influence clinicians.

Contemporary technology must address the needs and fill the healthcare gaps with beneficial solutions. Participant 4 suggested, "We need to design the telemedicine program around the need and around the gap. The point must be delivering quality of care rather than saying, 'That is a cool piece of telemedicine equipment, how can we fit this into our practice?'" Participant 1's statement had a similar sentiment: "When we use technology to deliver clinical services, you want to ensure it is a solution to a problem–an existing issue." Participant 3 asserted, "Although we do prefer to have an actual person to deliver care, sometimes we do not have that option, so we have to use these technologies." The study participant responses suggest that the need to achieve clinical outcomes based on the need is significant in using technology. The next strategy is closely related to the clinical outcomes but focused on organizational resources.

Cost and financial viability. As it relates to the research question, cost and financial viability are the clinicians' perception of the value of the technology as a financial investment. The advantages and disadvantages of adopting contemporary technology, with its financial implications to their organizations and to those they manage, appear to concern program leaders. Six unique quotes from participants related to this strategy (see Table 2). Participant 3 reported, "We have to be innovative because of lack of funding, geographical location, and lack of specialty providers is a challenge." Participant 1 noted, "You have to look at the benefits and how it outweighs the cost; you are investing in something that would be for the greater good." Participants appeared to be open to innovations when faced with challenges but were skeptical in how much resources it may take away from the organization. Participant 5 raised, "How are these

services going to be covered when they are provided to the patient, and how are we going to be reimbursed for those services?" Changes to the conventional model of providing healthcare services also raised doubts for participants. Financial concerns appear to affect clinicians' and administrators' perceptions, especially in the technology's effectiveness to address the delivery of healthcare services.

As it relates to the central research question, program leaders must be mindful of the financial implications to gain clinicians' acceptance of the technology. Current studies have supported this sentiment, such as Takumi et al.'s (2019) research of cost analysis in implementing a teleradiology system. They found that financial burden to the medical institution was a consideration when adopting telemedicine technology. Program leaders must be able to justify the cost and its probability of a successful implementation. Participant 1 contended, "If you can explain the cost benefits of the technology, clinicians will be more willing to accept what you are trying to promote." Based on the testimonies, financial benefits are also a strategy to gain clinicians' acceptance of the technology.

Perceived norms. Perceived norms, as it relates to the research questions, are the clinicians' perceptions of how the technology is accepted by their peers and colleagues in the industry. The participants provided insight into this phenomenon. Five unique quotes from participants related with this strategy (see Table 2). Participant 3 stated, "Doctors who recently graduated are more familiar with modern medicine; they understand and rely on these technologies." Similarly, Participant 2 explained, "Clinicians are well aware of the current technologies used in the industry, and the rural areas are influenced by what is adopted in the mainland United States." It appears peer endorsements often

influence evolving trends in healthcare. Participant 3 described, “In the urban areas, they have more specialty care, so rural clinics have to use technologies to deliver clinical care to the community in rural places.” The higher needs in remote locations appear to encourage increased usage of these technologies. The responses from participants suggest that the clinicians’ peers from more developed programs influence their perceptions and decisions.

Surprisingly, perceived norms ties with the conceptual framework of an evolved TAM model. TAM developed into TAM2, the extended technology acceptance model, which included a social influence construct (Venkatesh & Davis, 2000). According to Venkatesh and Davis (2000), the social component, called subjective norms, also influenced and compelled research participants in their study to act. In the current study, perceived norms are related to subjective norms through the clinicians’ perceptions of other people within their professional social circles. The responses from study participants indicated clinicians’ professional counterparts do influence their perception of contemporary technology. The next theme focuses on the actual use of technology.

Theme 2: Usability of Technology

The usability of technology pertains to the technology users’ positive or negative perception of the technology. The theme directly associates with TAM’s PEU. Davis (1989) defined PEU as the degree of effort a user perceives using a system or technology. The seminal research has supported PEU as a predictor of behavioral intention and other succeeding research (Davis, 1989; Venkatesh & Davis, 2000; Venkatesh et al., 2003).

Alternatively, there have been varying research viewpoints of its effectiveness in predicting technology acceptance.

Hoque and Bao (2015) claimed that PEU is an insignificant predictor of e-health adoption. Ducey and Coovert (2016) held a similar position but claimed PEU was a less significant indicator than PU. In this study, the theme had more quotations than the utility of technology, suggesting its significance and refuting the two previous studies. The theme had 28 unique quotes, which was higher than the utility of technology (see Table 3). However, in a more recent study by Shemesh and Barnoy (2020), the researchers claimed that user experience and technology design is a strong determinant of acceptance and use. This research continues to support PEU as a significant indicator of technology acceptance aligning with the theme. The theme usability of technology was grouped from three other strategies: (a) availability of technology, (b) overcoming technical problems, and (c) streamlined workflow.

Table 3

Usability of Technology

Participant	Availability of Technology	Overcoming Technical Problems	Streamlined Workflow
Participant 1	2		
Participant 2			3
Participant 3	3	1	1
Participant 4		2	3
Participant 5	2	8	3
Total	7	11	10

Availability of technology. The availability of technology, as it relates to the research question, is the strategy of creating the right environment to expose clinicians to contemporary technology. Seven unique quotes from participants related to this strategy (see Table 3). Participant 4 commented, "I think as administrators we want things to be as automated as possible. Personally, I prefer things to be all electronic." Program managers must communicate their needs to use technology. Participant 1 proposed, "Having x-rays that hook up to your laptop that can take pictures on the other island without the use of chemicals is very efficient." Participant 5 reported, "Improved peripherals, better cameras, and better speakers to support telehealth and telemedicine has been important to us. Also, having cloud teleconferencing services to facilitate face-to-face discussions." As the participants revealed, program managers with the intent to adopt technology must strategically invest with thoughtful consideration of equipment features and introduce it in the workplace before implementation.

Supporting technology and technical assistance must also be in place to help users. Participant 5 declared, "Since we implemented and installed fiber connectivity a couple of years ago, connectivity between our facilities improved. Fixing network blind spots within the institution has been important." Participant 3 reported, "We have the equipment, and having an established IT department that supports the infrastructure helps the telehealth services." The participants implied that in order for telemedicine technology to be effective it must be supported by other systems and maintained by technical support personnel.

Overcoming technical problems. Overcoming technical problems, as it relates to the research question, is remediating technical faults that may result in clinicians' negative perception of the technology. Wootten, McCuistian, Packard, Gruber, and Saberi (2020), in their study of technical problems encountered during the telehealth counseling study, posited that clinician satisfaction with the technology could be affected by technical challenges faced during the appointment with patients. The technology should be reliable, easy to use, and thoroughly tested to prevent disruptive occurrences when delivering healthcare services. Eleven unique quotes from participants related to this strategy (see Table 3). Participant 5 advised, "It is important to have a robust infrastructure to deliver optimal telehealth and telemedicine services. Having a reliable infrastructure helped gain clinicians' acceptance because it adds reassurance that everything will work." The participant also added, "Doing extensive testing before deployment is critical to get physicians to be convinced to use these technologies." Participant 3 stated, "It is important to start small when implementing something and test before going into large projects." Participant 4 offered, "Doing as much of the legwork as possible to make the process foolproof and really easy to run." The participant statements suggest that technologies used in healthcare must be thoughtfully designed, piloted, and tested with high reliability to gain positive clinician perception.

Backup systems and alternative procedures should be in place to ensure continued operation. Participant 4 suggested, "You need to be flexible. If a piece of technology is not working or is cumbersome and does not work out the way you planned, you have to have the ability to modify the plan." To ensure the appointment flow between clinicians

and patients is not disrupted, having an alternative solution and backup sources should also be available (see Wooten et al., 2020). Technology is also prone to failure, and having options to mitigate the impact on the delivery of services can encourage trust, continued use, and adoption of the technology.

Streamlined workflow. Streamlined workflow, as it relates to the research question, is the effective integration of the technology into the healthcare delivery process. Ten unique quotes from participants related to this strategy (see Table 3). Participant 4 suggested, "As much as possible, whenever they're using the equipment or software program, it is already integrated into their workflow." They continued, "I think it is important to take unnecessary work off clinicians to make it as easy as possible to use and useful to them." Participant 5 also noted, "To get these clinicians to buy into these technologies, the policy should be ironed out, which is the governance aspect of it, because it will help guide and dictate how these technologies would provide the clinical services." Participant 3 stated, "It is important to integrate technology into the workflow to meet the people's healthcare needs." A retrospective cross-sectional study by Bruyere Academic Family Health Team in eConsults from 2013 to 2017 supports the participant's testimonies. In the study, the researchers found that integrating technology in the existing process of healthcare delivery was vital in facilitating adoption and sustain usage (Liddy et al., 2020). The strategy conveyed by participants in this current study suggests intentional integration of technologies in the workflow is essential for clinicians. Also, clinicians seeing familiar work processes reduces the challenges of acceptance of new technologies.

Theme 3: Engaging Clinicians

Engaging clinicians pertains to the program managers' intervention to encourage clinicians' participation in contemporary technology planning and activities. As previously mentioned, the theme emerged unexpectedly and is not related to the conceptual framework. But recent studies support the theme and strategies to be related to acceptance of the technology. Keely and Liddy (2020) claimed that clinician participation contributes to the successful implementation of telehealth services. The researcher's efforts led to the successful use of electronic consultation and referrals to access specialists. The theme was grouped from the following strategies: (a) involvement, and (b) supportive culture.

Involvement. Involvement, as it relates to the research question is the sharing of relevant information and activities with the clinicians to increase awareness and encourage adoption of the technology. 16 unique quotes from participants related to this strategy (see Table 4). Participant 2 professed, "Implementing contemporary technology without the clinicians' knowledge such as impending changes to their work, and lacking introduction or training will most likely discourage acceptance of the new technology." Participant 4 reported a similar response, "Designing whole programs without clinicians' input is not effective; designing programs based around the equipment, is also not effective." Clinician involvement encourages technology acceptance and mitigates potential system design problems.

Table 4

Engaging Clinicians

Participant	Involvement	Supportive culture
Participant 1	3	
Participant 2	4	2
Participant 3	5	2
Participant 4	4	1
Participant 5		
Total	16	5

Clinician involvement provides a valuable contribution from users to help solve implementation or operational challenges. Participant 4 promoted, "I involve clinicians early on; in a sense, they have some ownership of the program. It's the ownership and buy-in that is a key component. Because even if there's some issues or there are some technical difficulties, they're more likely to get involved in finding solutions." Participant 3 suggested, "I think clinician should be involved in in structural and implementation decisions. It is best to involve everybody that will be using the technology in the planning and decision-making process. From a programmatic or administrative perspective, it is crucial to include clinicians on the onset of developing any plan, any decision-making, especially if it involves changes." Clinician involvement provides vital feedback to program managers to navigate potential problems that can interfere with the telemedicine program's progress. Another valuable strategy is culture.

Supportive culture. Supportive culture as it relates to the research question is developing a social environment that affirms the use of technology to encourage further acceptance. Five unique quotes from participants related to this strategy (see Table 4). Participant 1 declared, "If you listen to their concerns about the technology, they are more apt to accept what you are telling them. Clinicians will be more compliant and willing to agree with you." Participant 4 promoted, "Giving them feedback and tracking outcome of the telemedicine programs is really important. Feedback encourages them to keep using technology." The participant continued, "When they get to see the outcome of their work and what they are doing with the technology, I think it is encouraging for clinicians." Participant 3 stated, "The clinicians I work with through the organization are very accepting of the information technology to deliver clinical services. Majority are in support of them." Having open and effective communication is only part of developing a supportive culture in the organization, providing feedback and affirmation to continue using the technology provides opportunities to improve. With a supportive culture, individuals who lead the charge to promote the program can also be important.

In their study, Keely and Liddy (2020) advised, to have a successful e-consult/e-referral services, clinician participants should be willing to be frontrunners in supporting the program. Participant 2 espoused, "Start with the people or department that you know will most likely adapt and succeed with the new technology or process. Don't choose the department that you know will not back you up or embrace the new change." Participant 2 mentioned, "Identifying champions that will act as cheerleaders throughout the rollout process; this is important when implementing new technology, this will help convince

clinicians." Early adopters and passionate supporters of the organization's technology appear to be a key component in a successful program.

Documentation Analysis

My review of company documents and news articles supported the interview data and emergent themes. The company document, *Briefing for Board of Trustees*, published in 2018 and 2019, presented the need for telehealth services and illustrated the financial benefits of the services, which corroborates the strategies of *clinical outcome* and *cost and financial viability* under the theme use of technology. Also, the strategy *availability of technology* under the theme usability of technology relates to the organization's need for equipment and auxiliary services. I obtained organizational brochures that also reported the clinical outcomes of telemedicine. The leaders of the organization also shared PowerPoint presentations from professional panels that the in which the leaders engaged. The document *Opportunities for Telehealth and Telemedicine* related to the following strategies: clinical outcomes, availability of technology, perceived norms, involvement, supportive culture, and partnerships. Finally, I found news articles about the institution that specifically referenced their partnerships with other organizations to promote telehealth and telemedicine, relating to the supportive culture strategy.

Application to Professional Practice

Business leaders can apply the findings from this study to professional practice by establishing strategies to improve the institution's utility of technology, a critical financial asset in an organization. Although this study is in healthcare, most businesses have strategic goals to meet expected outcomes. To accomplish these outcomes, leaders

of organizations need to assess how effectively they use their resources, such as technology, to create a good return on investment. Industry professionals also develop best practices within a given field and share their preferred tools and technologies with their colleagues and how to best use them. Business leaders may influence technology users to increase acceptance by focusing on the strategies that may contribute to the business's overall profitability.

Business leaders may apply the findings from this research to professional practice by developing strategies to create efficient business processes through the usability of technology. User introduction to the technology is vital to encourage acceptance. Leaders must thoughtfully promote the technology to users by highlighting its benefits, effectiveness, and they must carefully consider technologies that complement and support their optimal use. The thoughtful design of the technology is not limited to the technology itself. Business leaders must keep the user in mind and integrate the technology into the workflow. Technical problems must be anticipated and contingencies need to be in place to ensure continued operation. These strategies are essential in promoting a positive perception of the technology and increasing staff productivity.

Business leaders may apply this study's findings to develop strategies to improve business operations by developing an organizational culture that promotes contemporary technology. The technology user's involvement and feedback in various technology planning and implementation stages can mitigate project delays and failures. Users can provide valuable information and insight into the business operations to overcome barriers related to technology acceptance. Also, by developing a supportive culture in

promoting new technology, the company can leverage technology advancements to reduce costs and attain a competitive advantage.

Implications for Social Change

The implication for positive social change is that healthcare program leaders can provide greater accessibility to specialized healthcare in rural communities through successful telemedicine programs. Lapointe, Lavallee-Bourget, Pichard-Jolicoeur, Turgeon-Pelchat, and Fleet (2020), in their rapid review of 187 articles of rural trauma patients, found that technologies such as telemedicine directly and positively impact clinical outcomes, management, and diagnosis. The success of these programs and positive reports provide healthcare providers, institutions, and funding bodies the necessary information to invest in rural areas. Rural locations provide the best telemedicine services setting due to a higher degree of need in the community (Jetty et al., 2018; Lapointe et al., 2020; Oest et al., 2019). Distinction and differences in capabilities between rural and urban care facilities are quite apparent. Telemedicine technology can help bridge the gap in disparate levels of healthcare delivery. These organizations' investment allows for the availability of services that can improve the level of health of individuals living in these remote regions. With the current COVID-19 public health emergency, this need has become more significant with rising demands in remote communities' training programs.

Another potential social change implication is providing employment opportunities for telemedicine operators and a training platform for clinicians to deal with emerging epidemics and pandemics. Elson et al. (2018) studied the integration of remote

specialists in telemedicine programs. They found that remote specialists such as telemedicine operators are beneficial in the treatment process by improving communication between patients and local clinicians. Programs such as these provide employment opportunities for people in these remote locations. In a related study, Li et al. (2020) analyzed training programs, online platforms, and real-time instruction to deliver updated COVID-19 knowledge and treatment protocols. The researchers found that these training programs effectively educated clinicians about the current pandemic and were useful for other training programs to meet clinical demands.

Recommendations for Action

Program leaders in the Marianas have an opportunity to further advance the telemedicine industry in the region, even in the current COVID-19 pandemic. Murry and Kennelty (2020) studied chronic health conditions through telehealth-mediated healthcare interventions. They found that there are opportunities in telehealth, especially in mitigating barriers that produce therapeutic outcomes. The interviews with participants produced three themes: (a) utility of technology, (b) usability of technology, and (c) engaging clinicians. Based on the emerging themes, I propose three recommendations for program managers.

The first recommendation is for program leaders to advertise clinical outcomes in their telemedicine project initiatives to promote adoption of the technology. Internal to the organization, program leaders could include presentations in employee workshops with strategically published informational literature made available for employees. Furthermore, having a point of contact can provide information and open communication

about the program and benefits of telemedicine technology. External to the organization, program leaders can advertise to community partners that can benefit from telemedicine services. Also, marketing through news agencies of telemedicine programs' healthcare benefits can impact both clinician and community perception of the technology.

The second recommendation is for program leaders to select the appropriate equipment through workplace observation and create a thoughtful workflow design that integrates technology for clinicians. Program leaders could observe and collaborate with clinicians to make informed decisions in purchasing the right equipment for the workplace. Moreover, they can research the right equipment and vendor to help integrate the telemedicine instrumentation to current systems and healthcare delivery process to ensure a smooth process workflow.

The third recommendation is for program leaders to involve clinicians in relevant parts of the design and implementation that affects their work. Clinician involvement is the most significant recommendation based on study results. Program leaders could encourage clinicians' active participation in implementation or technological improvements to ensure the proper setup and customization of telemedicine systems. After the implementation phase, the clinicians' continued involvement is essential to mitigate operational problems.

The recommendations stated above could be disseminated through a presentation and instructional materials to a target audience. These three recommendations could be explained with the appropriate discourse to the telemedicine program administrators in the event. Also, I have distributed the study recommendation to all participants.

Recommendations for Further Research

The world's healthcare needs are ever-growing and influenced by technological advances. For the healthcare industry to thrive, program leaders must leverage contemporary technology to accomplish their goals. In this regard, I found aspects of this study that are worthy of further research. My recommendation for future research is to replicate the study in other remote geographical areas in the Pacific Islands and the continental United States. I also recommend having a larger sample pool of participants with varying demographics to compare results. Moreover, researchers could examine the differences in cultures and levels of participation. Future research could also be in the areas of return on investment in organizations with high levels of technology acceptance. Furthermore, the other areas of study to explore are levels of attrition after the adoption of the technology.

While conducting the study, the serendipitous event of the COVID-19 pandemic presented other research possibilities. The current pandemic has amplified the need and value for telemedicine particularly in the field of remote monitoring and teleconsultation due to quarantines, lockdowns, and community social distancing measures (Giansanti, 2020; Watson, Wah, & Thamman, 2020). The differences in effective use of the technology between clinicians that successfully adopted telemedicine prior to the crisis, and those that rapidly accepted the modality out of necessity, can be a potential research for future researchers.

Reflections

Part of the challenge of the data collection through interviews was to not influence the participants with my personal views and opinions. Ever since I was introduced to telemedicine in a conference, I was interested in the possible applications of this technology and how it could benefit the Marianas Islands community. Working in the technology industry for several years, I knew that people struggled using these new types of machinery. I worked diligently to follow the interview protocol and to not reveal any reactions through body language to avoid nonverbal reactions that could affect the responses of the participants and influence their answers.

My preconceived notions among the themes were that clinical outcomes would be the most significant. After I coded the transcript and reviewed the data, I realized that my preconception was incorrect. After a brief self-reflection, I had let go of my biases and accept the findings. The experience has given me a new appreciation for data-driven results.

I experienced difficulty during various stages of the research due to uncontrollable circumstances. In the early stages of the study, I endured two super typhoons, Soudelor and Yutu, that devastated my home island in 2015 and 2018. These events detracted from my research progress due to the absence of essential services, such as power and Internet access, for several months. In the final stages of my study, COVID-19 became a pandemic and almost affected my data collection. I was able to complete my interviews just before the island went into lockdown. It would have been more of a challenge if I had not finished my data collection in the first two months of 2020, because

the hospitals and clinics would have had limited access and their personnel would have been unavailable. This study would not have been successful without the participants who devoted their time to the interviews.

Conclusion

Gaining clinicians' acceptance of contemporary technology in rural communities is a complex and challenging task. Program managers encounter technological, financial, and social barriers to achieve optimal use of technology. Finding the most effective strategy maximizes the return of investment and improves business processes. In the course of this study, I was able to obtain relevant information for program leaders who run telemedicine programs in a remote rural location. The result of this study supports technology acceptance strategies to help clinics and hospitals run a successful telemedicine program. This study's findings contribute to the existing knowledge regarding technology acceptance that can be applied in other industries and fields. Additionally, the findings can promote positive social change by providing rural communities access to specialized healthcare and by offering employment for those who live in remote areas.

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Appendix A: Interview Protocol

1. I will initiate the face-to-face interview by welcoming the participant and express my gratitude for taking the time to participate and will be sensitive to the length of the interview.
2. I will explain the purpose of the study and go over the consent form.
3. I will notify the participant that I am recording the interview and reiterate that it will be strictly confidential.
4. I will turn on the digital recorder and indicate the participants assigned code and announce the date and time of the interview.
5. The interview will last less than 60 minutes, as previously indicated in the consent form.
6. I will ask the six open-ended semistructured interview questions (Appendix B).
7. As the interviewer, I will be observing my body language and tone of voice to avoid unintentionally expressing my personal opinions and introducing bias.
8. I will paraphrase the statements as needed for clarity.
9. At the end of the interview question portion, I will notify the participant that they will have the opportunity to review the transcripts of the conversation for accuracy. I will schedule the follow up for member checking and provide my email address and contact number.
10. I will conclude the interview by thanking the participant.

Appendix B: Interview Questions for Study Participants

The following are six semistructured interview questions for the study participants.

1. What strategies have you used to gain clinicians' acceptance of contemporary technology to deliver clinical services?
2. What method did you find worked best to gain clinicians' acceptance of contemporary technology?
3. How did the clinicians respond to your different techniques to gain acceptance?
4. What strategies were least effective in gaining clinicians' acceptance of contemporary technology?
5. What modifications did you apply to any strategy to gain clinicians' acceptance of contemporary technology?
6. What additional information would you like to share that you did not address about clinicians' acceptance of contemporary technology?