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The Impact of the Digital Divide on Rural Community College Students

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This dissertation, directed and approved by the candidate's committee, has been accepted by the College of Graduate and Professional Studies of Abilene Christian University in partial fulfillment of the requirements for the degree

Doctor of Education in Organizational Leadership

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The Impact of the Digital Divide on Rural Community College Students

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Education in Organizational Leadership

by

Martin Ray Sheppard

July 2023

Dedication

I dedicate this project to the memory of my mom, Martha Baker, and grandmother, Katherine McLaurin.

Acknowledgments

The dissertation process has been long and difficult, and there are numerous people that I want to acknowledge. First and foremost, I would like to thank my dissertation chair, Dr. Timothy Stafford. His willingness to spend time discussing various ideas and providing resources and feedback has been a valuable source of encouragement throughout this process. In addition, I would also like to thank my committee members, Dr. Billie McConnell and Dr. Julie McElhany, for their willingness to provide helpful feedback and suggestions.

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Abstract

This qualitative case study investigated the perceived impact of the digital divide on rural U.S. community college students. An online survey was conducted of adult community college students at a rural community college. In addition, volunteer faculty at the same institution were interviewed through Zoom. The purpose of the student surveys and faculty interviews was to determine the impact of the digital divide on rural community college students and the ways in which these students seek to overcome the divide. This study used a theoretical framework that combined aspects of the situational theory of problem solving (STOPS) with the unified theory of acceptance and use of technology (UTAUT) to understand the factors that influence a student's ability to overcome the digital divide. This study used census data from the county where the college is located and surrounding counties to demonstrate the current availability of high-speed internet access in the area. This study found that the digital divide remains a challenge for rural community college students. The first-level digital divide, or the access divide, and the second-level digital divide, or the digital literacy divide, are barriers to student success at rural community colleges. These students employ a variety of methods to overcome the challenges they face because of the digital divide.

Keywords: digital divide, high-speed Internet access, computer ownership, smartphones, first-level digital divide, second-level digital divide

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Despite advances in internet access and technology, there remains a digital divide in the United States (Coffin et al., 2015; Silva et al., 2018; Stern et al., 2009). Broadly speaking, the nation can be divided into two groups when it comes to the access and use of technology—the geographically advantaged and the geographically disadvantaged (Katsinas & Moeck, 2002). The geographically advantaged are those living in areas of the country with access to high-speed, broadband internet services. The geographically disadvantaged are those living in rural areas of the country that are less likely to have access to high-speed, broadband internet services (Correa & Pavez, 2016; Salemink et al., 2015).

Residents living in rural communities around the nation are less likely to have internet service or computers in their homes and often depend on smartphones, which can have questionable service in very rural areas. Telecommunication companies are less likely to invest in connecting rural communities because it is less profitable (Philip et al., 2017). Widespread use of broadband internet in some rural areas is also limited by factors such as education, income, age, and race (Dutton & Reisdorf, 2019; Tawfik et al., 2016; Wei & Hindman, 2011).

Wei and Hindman (2011) suggested that there are two levels of the modern digital divide. The first level deals with the lack of access to technology and the internet. The second level focuses more on a person's ability to use broadband access and technology in a productive way (Dutton & Reisdorf, 2019; Philip et al., 2017; Wei & Hindman, 2011). Residents of rural communities often struggle with both forms of the digital divide, negatively impacting community college students living in these communities.

Community colleges serve an essential role in the United States by offering job training, technical programs, and university transfer programs that prepare students for their careers.

Without community colleges, many students would be shut out of higher education and the opportunities community colleges offer (Katsinas & Moeck, 2002). Because of their essential role, it is not surprising that community colleges have historically led the way in distance learning (Cejda, 2007; MacBrayne, 1995). As far back as the mid-1990s, MacBrayne (1995) suggested that distance education would be the future for rural community colleges.

Rural community colleges are responding to emerging educational technologies by moving toward blended, hybrid, and online courses and programs. These courses are leveling the playing field and have the capability of giving rural students a better education. These delivery methods extend the reach of the colleges and open the door of educational opportunities to more students. However, to take advantage of these opportunities, prospective and current students need to have dependable and regular access to the internet. Without broadband internet, students in rural areas will continue to fall behind their urban counterparts. Additionally, digital literacy skills are necessary to be successful in community college courses (Katsinas & Moeck, 2002).

Southeastern North Carolina is a rural geographic region. Outside of urban areas such as Fayetteville and Wilmington, most of the towns and cities in this portion of the state would be considered rural. My research focused on a county located in this region of North Carolina. The population of the county in 2018 was approximately 33,000. It is primarily rural and agricultural and has low rates of computer use, computer ownership, and broadband internet access. The rates for each were that, between 2013 and 2017, 75% of households had a computer, and 60.5% had broadband access. These numbers demonstrate that there remains a significant portion of the county's population that does not have a computer in the home or internet access.

The county is home to a community college with an average enrollment of around 1,200 students. One of the purposes of this research was to determine how students enrolled at this college have been impacted by the digital divide.

Statement of the Problem

U.S. community college students in rural areas face more educational barriers than their peers in urban areas (Tawfik et al., 2016). These barriers are associated with the first- and second-level of the digital divide and continue to be a problem in rural areas of the United States (Correa & Pavez, 2016; Hohlfeld et al., 2017; Silva et al., 2018). Even though broadband adoption rates have risen significantly in recent years (Coffin et al., 2015; Silva et al., 2018; Stern et al., 2009), inequalities remain in digital access and use among rural and lower socioeconomic groups (Dutton & Reisdorf, 2019; Tawfik et al., 2016; Wei & Hindman, 2011). Barriers, such as limited broadband access, inadequate home technology, and a lack of familiarity with the necessary technologies (Adam-Turner & Burnett, 2018), often mean rural students struggle in their classes (Xu & Jaggars, 2013).

There is a significant amount of research on the digital divide; however, there is a gap in the literature on the impact the divide is having on students taking online, hybrid, and blended courses at community colleges in this and other rural regions of North Carolina and beyond (Adam-Turner & Burnett, 2018). This research should benefit those in higher education and educational leadership by providing a region-specific perspective on how the digital divide impacts rural community college students taking online, hybrid, and blended courses.

Purpose of the Study

The purpose of this case study was to examine the impact of the digital divide on community college students living in rural Southeastern North Carolina. This research provides

information that can serve as an important guide to educators and decision makers as they seek to improve educational opportunities for rural community college students through internet access. This case study examined how rural community college students perceive the impact of the digital divide on their studies. This is important because people living in rural areas of the nation have been negatively impacted by the digital divide (Correa & Pavez, 2016; Salemink et al., 2015). The participants in this case study were students enrolled at a community college in Southeastern North Carolina.

Research Questions

 RQ1: What are the perceptions of community college students regarding their access to the internet and its resources when studying from home?

 RQ2: What are the perceptions of community college students regarding the impact of their digital literacy and their ability to use broadband internet resources to further their educational goals?

 RQ3: What are the perceptions of community college students regarding how their access issues to the internet could be overcome?

 RQ4: What are community college faculty perceptions of the impact of the first- and second-level digital divides on their rural students?

Definition of Key Terms

 Digital divide. Differential access to personal computers and the internet (Katsinas & Moeck, 2002). The understanding of the digital divide has evolved over time to include more than simple access to technology and the internet (Hohlfeld et al., 2017; Katsinas & Moeck, 2002).

Digital exclusion. The exclusion of certain populations from digital technology (Philip et al., 2017).

First-level digital divide. Unequal access to technology and broadband internet (Wei & Hindman, 2011).

Rural penalty. A lack of telecommunication resources in rural populations (Malecki, 2003; Salemink et al., 2015).

Rural potential. Untapped demand in rural communities for the services provided by telecommunication companies due to the lack of investment in technology (Salemink et al., 2015).

Second-level digital divide. Inability to productively use broadband internet access and technology (Wei & Hindman, 2011).

Ubiquitous connectivity. Universal connection to the internet and its resources (Zhao & Elesh, 2007).

Unified theory of acceptance and use of technology. The acceptance and use of technology at the individual level, using factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions (Lai, 2018).

Theoretical Framework

The theoretical framework for this study combines two theories related to problem solving and broadband internet adoption: the situational theory of problem solving (STOPS) and the unified theory of acceptance and use of technology (UTAUT). This introduction to the theoretical framework explains each theory and how I applied them in this research. The STOPS was proposed by Kim and Grunig (2011) as an update of the situational theory of publics (STP). STOPS allows us to examine what motivates people to engage in problem solving and the

different behaviors problem solvers engage in while seeking to solve a problem. The UTAUT attempts to explain the acceptance and use of technology at the individual level. Though not often used in the context of the digital divide, UTAUT is made up of four important parts: performance expectancy, effort expectancy, social influence, and facilitating conditions (Lai, 2018). Other factors, such as age and gender, are used to explain technology acceptance and use. Because UTAUT examines individual factors related to the use of technology, its focus is primarily on the second-level digital divide.

Methodological Framework

When conducting social science research, there are several methodological options available to the researcher. For the purposes of this research, I chose to do a qualitative case study. A case study can be defined as "an empirical method that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context" (Yin, 2017, para. 9). Yin (2017) argued that case studies are good for answering the how or why questions. Using a case study design allowed me to answer the study's four research questions, as stated earlier in this chapter.

Streams of Data

A case study examining the digital divide in each area relied on four types of data collection methods. Each collection method followed its own logic or data stream and provided an added layer of data that helped to explain the problem better. The first stream of data collection was using a Likert-scale survey that provided respondents with a variety of options. The second stream of data was follow-up interviews with volunteer students. The third stream of data gathered information on the percentage of households in the rural county with a computer and broadband internet subscriptions. The fourth stream of data was information gathered from

interviews with volunteer faculty. These interviews provided additional information on the impact of the digital divide.

Chapter Summary

This research provides insights to researchers on the impact of the digital divide on rural community college students. While there has been and continues to be an abundance of research on the digital divide, not enough specific attention has been paid to this problem. This research may benefit rural community colleges in North Carolina and around the nation by helping them understand how students perceive the impact of the digital divide on their studies.

Chapter 2: Literature Review

In this study, I examined the impact of the digital divide on rural community college students in Southeastern North Carolina. Current research on the digital divide has identified two significant ways in which the digital divide impacts community college students living in rural areas. First, these students are impacted by the lack of access to reliable broadband internet access. Second, some who have broadband internet access may lack the skills necessary to use the technology effectively. This literature review explores both impacts of the digital divide.

In the first section of this review, I report and discuss research related to the digital divide going back to a 1995 U.S. Department of Commerce report identifying the digital divide as an emerging challenge (McConnaughey et al., 1995). The next section explores literature related to a shift in how experts understand the digital divide. No longer is the digital divide simply about access; it is also about how the technology is used once people have access. The final two sections of the literature review focus on the problem of practice. First, I examine research that has investigated the direct impact of the digital divide on rural areas. Second, I report and discuss the literature studying the impact of both levels of the digital divide on students enrolled in a rural community college.

The Digital Divide as Defined in the Literature

In 1995, the U.S. Department of Commerce issued a report titled "Falling Through the Net: A Survey of the 'Have-Nots' in Rural and Urban America" (McConnaughey et al., 1995). The report looked at the concept of universal service—"the belief that all Americans need to have access to affordable telephone service" (McConnaughey et al., 1995, p. 4). While acknowledging the value of universal telephone service, the researchers pointed out two weaknesses. First, the statistics used did not include geographical information on the households

that were surveyed. Second, the statistics were limited to telephone service and did not include internet usage. According to McConnaughey et al. (1995), "While a standard telephone line can be an individual's pathway to the riches of the Information Age, a personal computer and modem are rapidly becoming the keys to the vault" (p. 4). They argued that the growth of the internet meant that there was a need to go beyond telephone service and start looking at affordable internet access.

The digital have-nots are overwhelmingly located in rural areas and cities. McConnaughey et al.'s (1995) research particularly singled out the challenges of the rural poor. The impact of this early digital divide was not just on individuals but also on entire communities. They found that even though low-income households in rural areas were likely to use the internet to search for jobs, they were often unable to do so because they did not have in-home access.

The U.S. Department of Commerce 1995 report was crucial in demonstrating the impact of the digital divide in the United States. However, even before the 1995 report, there were concerns about the technological divide and its impact on education (Katsinas & Moeck, 2002). Despite research, government and private initiatives, advances in communication and technology, and the rise of broadband internet, the digital divide continues to be an issue for many Americans living in rural communities (Coffin et al., 2015; Silva et al., 2018; Stern et al., 2009). The purpose of this literature review was to survey several important articles on the topic and relate them to the situation confronting rural community college students.

Though the term did not originate with them, Katsinas and Moeck (2002) provided a working definition of the digital divide. Their definition identified the digital divide as "access to personal computers (PCs) and the Internet-based information highway" (Katsinas & Moeck, 2002, p. 208). Their study focused on the digital divide, rural communities, and rural community

colleges. Rural communities lag behind the national average for computer ownership and internet access. Despite community colleges being the leading postsecondary institution within rural communities, these colleges are often not given the levels of government or private support that urban/suburban community colleges are provided (Katsinas & Moeck, 2002). As a result, rural community colleges have faced problems trying to secure the same level of support as more urban community colleges.

A Conceptual Shift: The First- and Second-Level Digital Divide

The initial focus of the digital divide was on access to technology. The U.S. Department of Commerce 1995 report demonstrated a sharp divide between rural and nonrural residents in terms of computer and modem penetration (McConnaughey et al., 1995). Rural areas were identified as disproportionately among the have-nots in relation to the digital divide. While factors such as race, age, and education level were part of the 1995 report, the focus was home access to a telephone, computer, and modem.

Since 1995, much research has been done on the digital divide and home access to computers and the internet. In 2002, Katsinas and Moeck published an article titled "The Digital Divide and Rural Community Colleges." The article surveyed the digital divide in rural communities and the impact of the divide on rural community colleges. They conducted their examination of the digital divide in rural communities by examining the subsequent Department of Commerce reports. My purpose in referencing their article is to demonstrate the state of the digital divide up until 2002.

Government officials and others first became concerned about rural access to computers and the internet in the early 1980s as the personal computer became more important. The importance of owning a personal computer only grew in the 1990s as the information highway

became more important. People needed access to personal computers and the information highway to stay caught up with the technological innovations occurring in society. To that end, the early 1990s saw an effort by lawmakers to make personal computers available to every elementary and secondary student in the United States. The U.S. Department of Commerce 1995 report "Falling Through the Net" was first published in the context of these social changes. Since 1995, there have been four updates to the report.

The 1998 version of this article found dramatic increases in personal computer ownership and internet access and usage (Katsinas & Moeck, 2002). The report found that between 1994 and 1997, there was an increase in the digital divide and "even greater disparity in penetration levels among some groups" (McConnaughey & Lader, 1998, p. 3). Rural areas of the country continued to lag behind in computer penetration and internet access. Education levels, income, race, and age played a major part in which rural residents had computer and internet access in rural regions. People who graduated from college were found to be 12 times more likely to own a computer and more likely to have and use internet access (Katsinas & Moeck, 2002). The report also found that, even in rural areas, those with higher levels of income were more likely to own a computer and have internet access. Race was also a factor in the access divide. Rural communities with high minority populations were less likely to own a computer and have internet access (Katsinas & Moeck, 2002). They found that the technology gap between White and Black households increased between 1994 and 1997 (McConnaughey & Lader, 1998).

A follow-up report published in 1999 found that although computer and modem ownership had increased, the digital divide remained a major problem. Several groups were identified as being most impacted by the digital divide (McConnaughey et al., 1999). Poor rural households, defined as earning less than $10,000 per year, had the lowest computer ownership

and internet access rate (Katsinas & Moeck, 2002). White households were still more likely than minorities to have computer and internet access in their homes. Rural young people under the age of 25 and single-parent households were also found to be negatively impacted by the digital divide (Katsinas & Moeck, 2002).

In 2000, the U.S. Department of Commerce's fourth report was released and, for the first time, included data on high-speed internet access. The report showed a dramatic increase in the number of Americans with internet access within the home. The report noted digital access improvement in every area and demographic, including geography, race, sex, and income. However, the report also noted that "a digital divide remains or has expanded slightly in some cases, even while Internet access and computer ownership are rising rapidly for almost all groups" (Katsinas & Moeck, 2002; Rohde & Shapiro, 2000, p. 16). Rural areas lagged behind both central cities and urban areas in the penetration of high-speed internet access (Katsinas & Moeck, 2002; Rohde & Shapiro, 2000). Minority groups continued to face a significant impact from the digital divide (Katsinas & Moeck, 2002; Rohde & Shapiro, 2000). The 2000 report also detailed how Americans were using the internet at that time.

Since 2002, the digital landscape has changed how researchers understand the digital divide. Researchers no longer think of the digital divide simply in terms of access. While access continues to be an issue in rural communities, the major digital divide of the early 21st century has been internet usage. This second-level digital divide represents a conceptual shift in how researchers view the problem (Roberts et al., 2017; Silva et al., 2018; Wei & Hindman, 2011; Zhao & Elesh, 2007). Demirtas (2023) stated, "Digital literacy represents a set of skills required for 21st-century individuals to utilize digital tools in order to support them reaching their goals" (p. 208). Having computer technology in the home is not enough to guarantee that people have

equal access to the information and social networks they need to benefit from the access to the technology (Zhao & Elesh, 2007). How household members use the technology (Wei & Hindman, 2011) and the doors the internet opens for them (Zhao & Elesh, 2007) are important parts of digital divide research.

While this new focus on the digital divide represents a shift in research, many of the same factors that contributed to the access-divide also contribute to the use-divide. Income, education, race, geography, and household makeup continue to be important indicators of unequal access and benefits from using the internet (Hohlfeld et al., 2017; Philip et al., 2017; Silva et al., 2018; Wei & Hindman, 2011; Zhao & Elesh, 2007). Social inequality is at the core of the second-level digital divide. Simply because a household theoretically has access to the internet does not mean they benefit from its use. In rural areas, broadband internet is very often unavailable, and if it is, it is often too costly for many households. Moreover, studies continue to show that education, income, and race play a role in broadband adoption rates (Silva et al., 2018).

One of the most important factors contributing to the second-level digital divide is education. The level of education a person has is directly related to how they use the internet (Dutton & Reisdorf, 2019; Wei & Hindman, 2011). People with higher levels of education are found to be more likely to use the internet for capital-enhancing activities, such as seeking out information on health, career, and government (Wei & Hindman, 2011, p. 219). This creates a knowledge gap, irrespective of the quality of access, between those with more education and those with less education (Wei & Hindman, 2011).

The rise of new digital media, such as smartphones and tablets, has not improved the situation for those with less education and income. Research demonstrates that those who earn less than $30,000 per year are less likely to have a smartphone, home broadband access, a home

computer, or a tablet. Even when those with lower incomes and education do have a smartphone, they are more likely to be solely dependent upon the smartphone to access the internet. This means they are more likely to attempt to use the smartphone for activities, such as completing job applications and schoolwork, that are best completed on a larger screen (Smith, 2015).

The Rural Digital Divide

Despite efforts to create ubiquitous connectivity throughout the United States (Zhao & Elesh, 2007), rural communities continue to face significant challenges with the digital divide in the United States (Correa & Pavez, 2016; Salemink et al., 2015). Advances in technology and broadband internet penetration have improved the access situation in rural communities, but a significant access divide remains a reality (Philip et al., 2017).

A major barrier to broadband internet access in rural communities is digital exclusion. Telecommunications infrastructure in rural communities is often not as widespread or dependable as the infrastructure in more urban areas. The reason for this digital exclusion is that telecommunication companies often find connecting rural areas less profitable than more urban areas. As a result, some people who live in rural areas only have access to slow, unreliable internet service, which does not fulfill their needs (Philip et al., 2017). The advent of new digital media has not corrected the rural penalty. A 2015 Pew report indicated that 7% of Americans who own a smartphone do not have broadband internet at home and are almost totally dependent upon their smartphones for internet access (Smith, 2015). Outside of the younger population, those with less education and lower income are more likely to be smartphone-dependent (Smith, 2015). Rural residents are also to be more smartphone-dependent than those in other areas (Smith, 2015). Moreover, rural smartphone-dependent users are likely to be confronted with slower data service (Philip et al., 2017).

The situation among these populations makes any assumption of ubiquitous connectivity in the United States difficult to sustain (Philip et al., 2017; Zhao & Elesh, 2007). Barriers to internet access remain a problem despite expanded internet penetration and the advent of new media. There is a rural penalty for those who live in rural areas. The penalty has created a paradox in which communities that are in the most need of better digital access are less likely to benefit from it (Philip et al., 2017)

Salemink et al. (2015) pointed out that some have argued that there exists a rural potential for telecommunication companies to invest in rural areas. However, it is likely that any such potential will be outweighed by the smaller population of rural communities, which will lead to smaller profits for telecommunication companies. Salemink et al. (2015) argued that urban areas simply remain more profitable for telecommunication companies than rural areas. Since telecommunications access is essential in the modern world, it may be necessary for governments to take action to ensure ubiquitous digital access.

The access digital divide remains an issue in rural areas. However, the digital literacy divide, or second-level digital divide, is also an issue in rural communities. The same 2015 Pew report that looked at smartphone-dependent users also reported on how people who are smartphone-dependent use the devices (Smith, 2015). The findings indicated that more than half of smartphone owners had used their smartphones to access a wide range of services and information, including banking, job searches and applications, and education (Smith, 2015). Lower-income smartphone users, who are more likely to be smartphone-dependent, report a higher rate of using their smartphones to search for jobs and submit applications (Smith, 2015). However, 44% of smartphone users reported having difficulty completing tasks using their smartphones. Among the tasks people reported having trouble completing were looking up

information online and work-related tasks (Smith, 2015). Completing educational tasks, such as submitting homework or engaging in discussion forums, also proves to be difficult on a smartphone. Despite the belief that anything that can be done on a desktop computer or laptop can also be done on a smartphone, students often find it difficult to complete certain types of assignments on smartphones (Dutton & Reisdorf, 2019).

Rural residents often have limited access to high-speed internet (Correa & Pavez, 2016, Salemink et al., 2015). They are also more likely to have lower income and education levels (Correa & Pavez, 2016). These factors mean that people living in rural communities may be more likely to be smartphone-dependent (Smith, 2015). It is also important to note that the slower acceptance and adoption rates of new information technologies in rural communities can also be an issue (Correa & Pavez, 2016).

The adoption of broadband internet in rural areas lags behind other parts of the nation (Correa & Pavez, 2016). Research indicates that several challenges confront rural residents that might help account for their slower adoption rates of broadband internet. While socioeconomic and educational status play a role in the adoption rates of a community, they are not the sole factor that seems to be slowing adoption (Correa & Pavez, 2016). Correa and Pavez (2016) conducted a study of the attitude of rural Chilean communities. Though a different context than the Southeastern United States, there are a number of principles that can be applied in general to rural communities. However, the authors of the research acknowledged that more detailed research would be needed (Correa & Pavez, 2016). Their research indicates there might be interpersonal reasons for the delay in adoption in rural communities. People in rural communities can sometimes express negative attitudes toward technology and have concerns about privacy

and personal security. These traits tend to be more pronounced among older populations who sometimes dominate rural areas.

The Digital Divide and the Rural Community College

Katsinas and Moeck (2002) identified the digital divide as a major problem for rural communities. Despite progress in technology, the gap between the technological haves and have-nots has only increased (McConnaughey & Lader, 1998). New technologies have not brought us ubiquitous connectivity (Zhao & Elesh, 2007). The barriers thought to hinder rural communities from fully enjoying the technological revolution include education levels, age, race, geography, and a lack of access to rural community colleges (Katsinas & Moeck, 2002). Lower education levels are identified as impacting a person's ability to access and effectively use internet technology.

Katsinas and Moeck (2002) explored the impact the digital divide had on rural community colleges; they argued that community colleges play a "preeminent role as leading educational institutions within their service delivery areas" (p. 209). Katsinas and Moeck (2002) were concerned about rural community college students' ability to use the equipment and the funding community colleges need to support increased computer and internet access (p. 222).

Despite advances in educational technology and access, community college students in rural areas continue to be unequally impacted by the digital divide (Tawfik et al., 2016). While society has seen an increase in the number of institutions of higher learning, many underrepresented students are being left behind by the technological demands of modern higher education. Research demonstrates that the rise in online learning has had a negative impact on students who are part of traditionally marginalized populations (Tawfik et al., 2016). The result

continues to be that many in need of higher education are being left out because of the very technologies that were intended to make higher education more accessible.

The impact of the first-level digital divide on higher education was further explored by Crocker and Mazer (2019). Their research focused specifically on technology apprehension in developmental courses at community colleges. A portion of their research addressed how the digital divide is impacting community college students. Like other scholars before them (Katsinas & Moeck, 2002), Crocker and Mazer (2019) recognized the shift in scholarly focus from the first-level digital divide to the second-level digital divide. However, their research demonstrated that the access divide continues to be an issue in many areas. Community college students they questioned for their research indicated that even though many had used computers for at least a decade, a number lacked home access to technology and the internet and expressed frustration with the difficulty they had accessing internet technology. Whether it was finding public access or relying on friends and family, students continued to find digital access to be an issue (Jaggars et al., 2021).

The COVID-19 pandemic caused community colleges in North Carolina to transition to the online format. Though research on the impact of the emergency shift to online or remote learning due to the pandemic is currently being done, the pandemic forced instructors to move their traditional, hybrid, or blended classes fully online (Hodges et al., 2020). This shift to online instruction dramatically increased the number of faculty who use digital learning when teaching. According to research conducted by Adam-Turner and Burnett (2018), any such move would force many instructors to consider using digital learning technology for the first time. Since faculty are the "primary contacts with students" and are "aware of rural students' technology limitations to achieving learning success" (Adam-Turner & Burnett, 2018, p. 28), there was a

need for faculty to take into consideration challenges rural students faced due to the closure of traditional campuses during the pandemic. Hodges et al. (2020) recommended that faculty use asynchronous online activities because students might be unable to attend classwork immediately.

Though the digital divide has received significant attention in the literature, the impact of the digital divide on rural community college students has not received the necessary attention. This is surprising because community colleges are often the major postsecondary educational institution (Katsinas & Moeck, 2002) within rural communities. The situation for many community college students requires further research because online community college students tend to have higher dropout rates than other students and tend to be lower-income, working adult students (Xu & Jaggars, 2013). Research demonstrates that rural community college students taking online, hybrid, and blended classes face significant challenges created by the digital divide. While there are a few seminal works on the subject (Adam-Turner & Burnett, 2018; Katsinas & Moeck, 2002), much more research needs to be done on the digital divide's impact on rural community college students.

Theoretical Framework Discussion

The theoretical framework for this study brought together two theories related to problem solving and broadband internet adoption. In this research, I blended the STOPS and the UTAUT to create a framework for this study. This introduction to the theoretical framework of this study explains each theory and how the theories came together in this research (see Figure 1).

Figure 1

Summary of Theories

Theory	Focus of the theory	Source of motivation	Role in framework
STOPS	Situational theory of problem solving	Personal Motivation	Explains what motivates people to engage in problem solving.
UTAUT	Acceptance and adoption of technology	External Motivation	Explains the factors that influence a person's acceptance and adoption of technology.

Situational Theory of Problem Solving

The STOPS was first proposed by Jeong-Nam Kim and James E. Grunig (2011). STOPS is an updated version of the situational theory of publics (STP), which described communication action in terms of information seeking and processing or information acquisition. STOPS goes beyond STP and explores why people become active when confronting problems and how they become active (Kim et al., 2012). STOPS adds a motivational variable known as the "situational motivation in problem solving" (Kim et al., 2012, p. 145). Using STOPS, researchers can examine what motivates people to engage in problem solving. Motivations can include, among other factors, how a person perceives a situation (Kim et al., 2012). According to STOPS, when a person identifies a problem and begins to work out a resolution to that problem, their "communicative activeness increases" (Kim et al., 2012, p. 127). According to Kim et al. (2012), STOPS assumes that "most human behavior is motivated by problem solving" (p. 123). As such, the theory examines several different behaviors that the problem solver engages in while working to solve their problem.

First, the problem solver obtains information about the problem via information seeking and by information attending (Kim & Grunig, 2011). Information seeking is active information gathering; information attending is passively gathering relevant information from various sources

without actively seeking it out. Second, the problem solver transmits the information to others. People who are engaged in problem solving communicate their problems and solutions with others to increase common knowledge and enhance collective problem solving (Kim & Grunig, 2011). Third, the problem solver is engaged in information selection. Information selection refers to "the extent of a problem solver's directedness in acquiring and sharing information either to economize his or her cognitive resources in problem solving or to optimize his or her preferred solution and end states" (Kim & Grunig, 2011, p. 126).

The practical application of STOPS to the digital divide is the need for people to recognize the problem so they can move toward solving the problem. Kim and Grunig (2011) argue that people are more likely to engage in information behaviors when they recognize the existence of a problem that impacts their life. Once people recognize the problem, they start seeking out information and transmitting that information to others in ways that begin the process of solving the recognized problem. In this case, the problem is the digital divide and its impact on rural community college students. Students impacted by the divide need to perceive the problem and its impact on their education.

Unified Theory of Acceptance and Use of Technology

Though not often used in the context of the digital divide, UTAUT attempts to explain the acceptance and use of technology at the individual level. UTAUT is made up of four important parts: performance expectancy, effort expectancy, social influence, and facilitating conditions (Lai, 2018). Other factors, such as age and gender, are used to explain technology acceptance and use. Because UTAUT examines individual factors related to the use of technology, the major focus of the theory in relation to this study was primarily the second-level digital divide.

Since the bulk of this research examined the second-level digital divide, the UTAUT was of central importance. Though, UTAUT is often avoided by those researching the digital divide because of the difficulty of obtaining the necessary user information (Pick & Sarkar, 2016). In this study, I obtained user information using census data and a qualitative case study.

Blending the Theories

The blending of STOPS and UTAUT created the theoretical framework for this research. The research questions at the core of this study focus on rural community college student perceptions of the impact of the first- and second-level digital divide on their studies. The foundation of the framework is found in STOPS. According to this theory, when people encounter problems in life, they engage in communicative actions to help solve the problem (Kim & Grunig, 2011). This leads to the question: How do student perceptions lead them to respond to their situation in regard to the digital divide?

UTAUT focuses on the behavior of the individual categories (Pick & Sarkar, 2016). A student's gender, age, socioeconomic status, and access to technology are facilitating conditions determining the degree to which any student is likely to adopt a given technology (El-Masri & Tarhini, 2017; Pick & Sarkar, 2016). Many might assume that young, college-age students would be highly motivated to seek out innovative, technology-based solutions to their digital challenges. However true that might be among students who are comfortable with technology, UTAUT theorizes that performance expectancy, effort expectancy, social influence, and other conditions, such as poverty or living in a rural community with limited access to the internet, might combine to limit a rural student's perception of how they have been impacted by the digital divide (El-Masri & Tarhini, 2017).

Lai (2018) examined factors that influence the adoption of mobile devices for learning among older adults. In that research, Lai found that social influence was the most important factor in determining whether an older person would adopt a mobile device for learning. This demonstrates the importance of family and peer groups in determining whether a person will adopt and use a technology. Though Lai's (2018) research focused on older adults, additional research has demonstrated the importance of social influence on some college students (El-Masri & Tarhini, 2017).

Among college students, performance expectancy has been found to be one of the most important factors in determining adoption and use of a technology. Performance expectancy, or the degree to which a student believes a technology will be useful to them, plays a major role in their willingness to adopt and use a technology (El-Masri & Tarhini, 2017). This was also seen as being an important factor in the adoption and use of technology among older adults (Lai, 2018).

Though effort expectancy, or the perceived difficulty of using a technology, has proven to be an important factor in some student populations, it seems to be less important among students who are more familiar with the internet and related technologies (El-Masri & Tarhini, 2017). This also holds true with older adults who feel more comfortable using the internet (Lai, 2018).

UTAUT focuses on external factors that influence a person's acceptance and use of technology (El-Masri & Tarhini, 2017; Lai, 2018; Pick & Sarkar, 2016). Including the UTAUT theory as a framework for this study allowed me to consider other factors that might be influencing the student's attitudes and reluctance to adopt certain technologies if they were available. Maybe the student is older and has a lower socioeconomic background. Combine those

factors with living in a rural community and now there is a fuller understanding of why they might have been late adopters or laggards. After all, older adults and people whose incomes are below the federal poverty threshold are more likely to be negatively impacted by the digital divide than others (Katsinas & Moeck, 2002; Lai, 2018; Wei & Hindman, 2011).

Chapter Summary

This literature review has explored research investigating the impact of the first- and second-levels of the digital divide on rural community college students. The review examined the access divide beginning with a 1995 U.S. Department of Commerce report identifying the digital divide as an emerging challenge (McConnaughey et al., 1995). Rural communities were found to be among the have-nots of internet service. This remained true into the 21st century when Katsinas and Moeck (2002) noted that rural communities continued to lag behind the national average for computer ownership and internet access. Adoption rates of broadband high-speed internet in rural areas continue to fall behind other parts of the nation (Correa & Pavez, 2016). Education and socioeconomic status continue to be factors in lower rates of adoption in rural areas. Other factors include a poor attitude toward technology and concerns about privacy and personal security (Correa & Pavez, 2016).

First- and second-level digital divides negatively impact rural community college students. Though community colleges are often the single major postsecondary educational institution within rural communities (Katsinas & Moeck, 2002), inadequate attention has been given to how the digital divide impacts rural community college students. Rural community college students sometimes lack home access to the internet and are often frustrated with the difficulty they have when trying to access the internet to complete their work. The technological

and skill requirements of online learning often further frustrate and challenge students who are part of traditionally marginalized populations (Tawfik et al., 2016).

The theoretical framework of STOPS and UTAUT helped me address the main concern at the heart of the research questions—student and faculty perceptions of the digital divide. This literature review demonstrates that a variety of factors, including socioeconomic status, education, and geography, play a role in determining whether a rural community college student will identify the digital divide as a problem, adopt the new technologies, and how quickly they will adopt the technologies that could help them overcome their digital divide.

Chapter 3: Research Method

This chapter examines the methodology I used in this study on the digital divide. I discuss the qualitative case study methodology along with data collection methods. I report on the population to be researched, the context of the population, and how I recruited and selected participants. The chapter then addresses issues related to credibility, transferability, and dependability of the research. Finally, the chapter ends by looking at various ethical considerations that the participants and I need to consider.

When conducting social science research, there are several methodological options available to the researcher. For example, a researcher could choose to do a quantitative study, a qualitative study, or a mixed-methods study. The type of research the researcher is conducting helps to determine which research methodology would work best. For this research, I chose to conduct a case study.

While the exact definition of a case study varies from author to author, there are several helpful and concise definitions. First, Alpi and Evans (2019) defined case studies as "ways to explain, describe, or explore phenomena" (p. 2). Yin (2017) defined case studies, in part, as "an empirical method that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context" (Yin, 2017, para. 9). The purpose of this study was to explore and investigate the impact of the digital divide on rural community college students in Southeastern North Carolina.

Population, Setting, and Sample

This research examined the perceptions of the digital divide among rural community college students. For purposes of this research, I restricted the sample to adult students residing in a rural county in Southeastern North Carolina and who were currently enrolled in online,

hybrid, and blended curriculum classes at the county community college. I limited the faculty

sample to full-time curriculum faculty who were teaching online, hybrid, or blended classes.

After obtaining permission from Abilene Christian University's Institutional Review

Board (IRB; see Appendix A) and the community college president, I sent an email to all

qualifying students explaining the purpose of the survey and a link to the survey in Survey

Monkey. No student was selected in advance to receive a survey (Shenton, 2004). As part of the

survey, respondents had an opportunity to volunteer for an in-person interview to follow up on

several themes in the initial survey. Full-time curriculum faculty at the community college were

sent an email inviting them to participate in an in-person interview.

Establishing Trustworthiness

Establishing the trustworthiness of a qualitative case study can be difficult (Shenton,

2004). However, several researchers have established methods that qualitative researchers can

use to ensure trustworthiness. Qualitative researchers should adopt well-accepted research

methods, use random sampling, and different methods of gathering information (Shenton, 2004).

This research meets each of these standards by randomly including participants and not selecting

any participants based on researcher preference. To collect data from the participants, I used a

survey (see Appendix B) and semistructured interviews (see Appendix C). To prevent

participants from taking the survey multiple times, I conducted it using Survey Monkey's online

tool. This tool allowed me to limit the number of times a participant could submit the survey, and

each participant was limited to one survey submission.

The limitations of this study are typical of qualitative case studies. I have taken care to

make sure that "the processes within the study" have been clearly outlined, "thereby enabling a

future researcher to repeat the work, if not necessarily to gain the same results" (Shenton, 2004,

p. 71). I have worked to "ensure as far as possible that the work's findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher" (Shenton, 2004, p. 72). The study focused on students attending online, hybrid, and blended classes at a rural community college in Southeastern North Carolina. It cannot be assumed that the results of this study can necessarily be transferred to other geographical areas and colleges (Shenton, 2004). Therefore, there may be limited transferability to other situations and communities. The number of students involved in this study was limited by the size of the community college and the number of students who responded to the initial email outreach. Student behavior, such as not checking their college email, helped to limit the number of participants in the research.

Data Collection and Analysis

In this case study, I relied on four types of data collection methods to examine the digital divide. Each collection method provided an added layer of data that helped to explain the problem better.

The first method of data collection was surveys (see Appendix B). According to Fink (2006), "Surveys are information collection methods used to describe, compare, or explain individual and societal knowledge, feelings, values, preferences, and behavior" (p. 1). A survey is a "questionnaire that someone fills out alone or with assistance" (Fink, 2006, p. 1). Surveys can be conducted on paper, online, or in person.

Having obtained permission from the Abilene Christian University's IRB and the community college's president, a digital survey was sent via college email to all adult, online, hybrid, and blended curriculum students enrolled in the community college and living in the county. The email included a link to the survey in Survey Monkey. Because students at the

college may not regularly check their college email and mail sent through the postal service might get ignored, it was expected that responses to this survey would be limited. To increase student participation and include students who have been impacted by the digital divide and were unable to complete the survey at home, the email included information on where the students could complete the survey at one of several open computer labs on the community college campus. I analyzed the results of the surveys using descriptive statistics. This statistical data provide an overview of the impact of the digital divide on students enrolled at the college.

The second data collection method was follow-up interviews with volunteer students attending the community college. As part of the survey, respondents had an opportunity to volunteer for an in-person interview to follow up on several themes in the initial survey. I interviewed all students who volunteered for an in-person interview. The interviews expanded upon the questions on the survey because I sought a more detailed understanding of the student's digital situation and challenges (see Appendix B). The exact number of interviews was determined by the survey response rates and the number of students who agreed to be interviewed. However, the goal was to interview at least 10 students (Mason, 2010).

I coded the results of the student interviews using NVivo qualitative data analysis software to find similar phrases and themes (Moser & Williams, 2019) that related to the research questions to include perceptions of students concerning the impact of their access to high-speed broadband internet and their level of digital literacy as indicated by their ability or lack thereof to complete their schoolwork. I also coded phrases related to ways they have attempted to overcome their digital challenges.

The third data collection method included examining census information on the county where the community college was located. Census information can be used to gather information

on the percentage of households in the county with a computer and with broadband internet subscriptions. Since household education and income levels are tied to the digital divide, this information could also be pulled from census reports. These reports, along with the surveys and interviews, provided me with a better understanding of how the digital divide has impacted community college students in the county.

The fourth data collection method was information gathered from the community college. While the college did not have records related to the county's digital divide, faculty interviews were able to provide important information. Interviewing faculty members was key in understanding the faculty experience with students who have been impacted by the digital divide. Once the student surveys and interviews were complete, an email was sent to the college's curriculum faculty, providing them with the opportunity to be interviewed for the research.

I coded the results of the faculty interviews using NVivo qualitative data analysis software to find similar phrases and themes (Moser & Williams, 2019) that related to the research question on faculty perceptions of the impact of the first- and second-level digital divide on their students. I compared faculty responses to student responses to find areas of agreement and disagreement on the impact of the digital divide. I compared the two groups using the NVivo coding to find common themes and phrases.

My objective for these four data streams was to gain a better understanding of how the digital divide was impacting online, hybrid, and blended students at the community college. The initial digital surveys provided a descriptive statistical overview of the impact of the divide on the students. Census data from the county enabled me to compare the descriptive statistical sample to the general population of the county.

The interviews resulted in a deeper understanding of student and faculty perspectives on the impact of the digital divide. How students perceived the impact of the divide on their studies was a major focus of this research. The interviews gave students the opportunity to provide real-life examples of how the digital divide has created challenges for them as they work to complete their studies at the college and to explain the various techniques they have used to overcome those challenges. The faculty interviews provided additional real-life examples of the divide from the faculty perspective. I compared faculty responses to student responses to find areas of agreement and disagreement on the impact of the digital divide.

Ethical Considerations

There are ethical considerations and risks associated with most research studies. The risks to participants in this study were minimal. I minimized any social, educational, economic, psychological, and legal risks. I have kept both survey and interview data anonymous. No names, home addresses, or student identification numbers were requested or recorded. Students were never asked to identify specific classes or instructors. The Institutional Effectiveness Office at the college created the initial survey in Survey Monkey and emailed the survey to qualifying students. I only had access to the survey results and did not have access to the list of names, email addresses, or identification numbers for the students who took the initial digital survey. I did have access to the names and email addresses of students who volunteered for the follow-up interview. However, I included no identifying student information in my notes, audio recordings, or transcripts of the interviews. All answers on the surveys and interviews were kept anonymous. I kept recordings and transcripts in a secure, password-protected hard drive until the study was completed. Once the study was completed, I informed the Office of Research and Sponsored

Programs at Abilene Christian University. All recordings, transcripts, and survey results will be kept for 3 years. The risk to student participants in this research was extremely low.

I conducted faculty interviews using the same methods. No identifying employee information was included in my notes, audio recordings, or transcripts of the interviews. All answers from the interviews were anonymous. I kept all recordings and transcripts secured until the study was complete. Once the study was completed, I informed the Office of Research and Sponsored Programs at Abilene Christian University. All recordings, transcripts, and survey results will be kept for 3 years. The risk to faculty participants in this research was extremely low. The benefits for students participating in this research were developing an awareness of the direct impact of the digital divide on their schooling and life and that they chose to take action to improve their digital experience and use.

Chapter Summary

Using a qualitative case study of a rural community college in Southeastern North Carolina, this research examined the impact of the digital divide on rural community college students. Student perception of the impact of the digital divide on their education was at the center of this research. I analyzed the results of a student survey and interviews of students and selected faculty to explore the impact of the digital divide on these students.

Chapter 4: Results

In this research, I examined the impact of the digital divide on rural community college students attending a community college in Southeastern North Carolina. This chapter examines the results of student surveys, faculty interviews, and county census data on computer ownership and internet access. I used the information collected to address the following research questions:

RQ1: What are the perceptions of community college students regarding their access to the internet and its resources when studying from home?

RQ2: What are the perceptions of community college students regarding the impact of their digital literacy and their ability to use broadband internet resources to further their educational goals?

RQ3: What are the perceptions of community college students regarding how their access issues to the internet could be overcome?

RQ4: What are community college faculty perceptions of the impact of the first- and second-level digital divides on their rural students?

Student Surveys

The purpose of the student surveys was to collect data on how the digital divide has impacted students attending a community college in a rural county in North Carolina. The surveys provided a statistical overview of the impact of the digital divide on students.

For this research, a digital survey was sent via college email to adult, online, hybrid, and blended curriculum students who resided in the county. The email included a link to the survey in Survey Monkey. Since students at the college may not regularly check their college email and mail sent through the postal service might get ignored, it was expected that responses to this survey would be limited. A total of 35 students responded to the digital survey. The survey

included 26 questions that were grouped according to the relevant research question. In this chapter, the survey questions follow the research question and are included in tables. A Likert-type scale was used for each question in the survey. Respondents were given the option to respond to each statement in the survey by selecting *strongly agree*, *agree*, *neither agree nor disagree*, *disagree*, or *strongly disagree*. I entered the results of the digital surveys into Microsoft Excel and calculated means, medians, modes, and standard deviations.

Faculty Interviews

The purpose of the faculty interviews was to gain an understanding of faculty perceptions of how the digital divide has impacted students at the community college. Following the completion of the student surveys, an email was sent to all curriculum faculty at the college, asking them to volunteer to be interviewed for the research. I interviewed six faculty volunteers on Zoom and recorded them for later review. No identifying information was included in my interview notes. I interviewed them in the order in which they volunteered, and no faculty member was preselected to be interviewed. In this chapter, faculty member responses are labeled based on the order in which they were interviewed.

The transcriptions of the faculty interviews were coded using NVivo qualitative data analysis software to identify similar phrases and themes (Moser & Williams, 2019) that are relevant to RQ4. In addition, the coding process followed the six phases of reflexive thematic analysis as presented by Braun and Clarke (2022). I then compared faculty responses to student survey results to find areas of agreement and disagreement on the impact of the digital divide.

Survey and Interview Results

In this research, I sought to examine the ways in which the digital divide (first-level and second-level) has impacted students. The first-level digital divide refers to a lack of access to

high-speed internet service (Wei & Hindman, 2011). This lack of access might be due to financial issues or a lack of internet service in a specific geographic region. The second-level digital divide refers to a lack of digital literacy (Dutton & Reisdorf, 2019; Philip et al., 2017; Wei & Hindman, 2011). Digital literacy is a person's ability to effectively use high-speed internet to complete important tasks, such as taking online, hybrid, and web-assisted classes at the community college. The research questions for this study examined both levels of the digital divide. The first three research questions focused on student perceptions of the digital divide and were measured using the student surveys. The fourth research question focused on faculty perceptions of the digital divide and its impact on their students. I considered the student surveys, interviews, and faculty interviews together to compare how the two groups viewed the impact of the digital divide.

First-Level Digital Divide

RQ1: What are the perceptions of community college students regarding their access to the internet and its resources when studying from home?

The first level of the digital divide impacting people living in rural communities is the lack of access to the internet and related resources. The survey included six questions examining students' high-speed internet access and resources when studying from home. The first two questions related to access and the digital divide were whether a person has access to high-speed internet at home and whether a person has a computer (laptop or desktop) at home. The responses to these two questions in the survey demonstrated that most respondents had both high-speed internet access and a computer at home (see Table 1).

Table 1

Home Access to the Internet and Computer

Question	*Mdn*	Mode	*M*	*SD*
I have dependable access to high-speed internet at home.	1	2	1.04	1.14
I have a dependable computer (laptop or desktop) at home.	2	2	1.29	0.98
I have a dependable computer (laptop or desktop) at home but do not have access to high-speed internet due to financial reasons.	0	0	-0.25	1.17
I have a dependable computer (laptop or desktop) at home but do not have access to high-speed internet because it is not available where I live.	-1	-1	-0.96	0.92
I do not have a dependable computer (laptop or desktop) at home, nor do I have access to high-speed internet due to financial reasons.	-1	-1	-1.04	0.88
I have a dependable computer (laptop or desktop) at home but do not have access to high-speed internet because of personal convictions	-1	-1	-1.32	0.61

Note. Strongly Agree = 2, Agree = 1, Neither Agree nor Disagree = 0, Disagree = -1, Strongly Disagree = -2.

The additional questions in this portion of the survey sought to learn why some reported not having high-speed internet access or a computer at home. While most respondents *disagreed* with the statements about not having high-speed internet access at home, those who did *agree* with the statements indicated that financial reasons and access to the technology were barriers. Only two respondents reported not having access to a computer (laptop or desktop) or high-speed internet access at home. No respondents indicated they did not have access or a computer because of personal conviction.

My interview questions for the faculty were related to the fourth research question: "What are community college faculty perceptions of the impact of the first- and second-level digital divides on their rural students?" While the survey indicated that most respondents did have a computer and high-speed internet access at home, the faculty interviews revealed that more students struggled with access than the survey results showed. While Faculty Member 2,

who teaches IT (information technology), said most of their students have a computer and high-speed internet access at home, other faculty said it is common to have students in their classes who do not have dependable internet access at home. The faculty also indicated that some students do not have internet access at home due to financial reasons and access to the technology.

Even though most respondents in the student survey *disagreed* with the statement that they do not have access to high-speed internet because it is not available where they live, several faculty members stated that it is common for students in rural areas to be without access to high-speed internet. Faculty Member 6 pointed out that where a person lives in the county would determine whether a person has high-speed internet access or not. Multiple faculty members living in the county's isolated areas were still using DSL (digital subscriber line) or another service that does not provide high-speed internet access. Even though personal economic issues did not rank high among factors limiting access to dependable internet service in the student survey, Faculty Member 3 identified a student's socioeconomic status as impacting their access to high-speed internet. The problem follows the student throughout their educational career, and by the time they get to college, they have already fallen behind. According to Faculty Member 2, the economic divide creates a digital divide between the haves and the have-nots. The have-nots are the students who cannot afford computers, iPhones, iPads, or high-speed internet access. Indeed, several faculty members raised the problem of students who do not have a dependable computer at home. From the faculty perspective, this situation tends to be related to a student's economic situation. When students do not have dependable internet access at home, they often try to find ways to work around that problem.

Research indicates that students who do not have high-speed internet or a computer (laptop or desktop) at home sometimes attempt to complete their schoolwork on a smartphone (Smith, 2015). A second part of this portion of the survey focused on using smartphones for schoolwork (see Table 2).

Table 2

No Computer and Using Smartphone for Schoolwork

Question	*Mdn*	Mode	*M*	*SD*
I do not have a dependable computer (laptop or desktop) at home, but I do have access to an internet-capable smartphone.	-1	-1	-0.57	1.10
I do not have a dependable computer (laptop or desktop), access to high-speed internet, or access to an internet-capable smartphone.	-1	-1	-1.18	0.77
I do most of my schoolwork using a smartphone.	-1	-1	-0.92	1.18
It is easy for me to complete my schoolwork using a smartphone.	-1	-2	-1.07	1.05
I am often frustrated when trying to complete schoolwork using my smartphone.	0	0	0.25	1.27

Note. Strongly Agree = 2, Agree = 1, Neither Agree nor Disagree = 0, Disagree = -1, Strongly Disagree = -2.

A glance at the mean indicates that most survey respondents do not normally complete their schoolwork using an internet-capable smartphone. Respondents *disagreed* with the statement that it is easy to complete schoolwork using a smartphone. The mean indicates that respondents are often frustrated when trying to complete their schoolwork using a smartphone.

The faculty interview did not include a question about smartphones. However, the topic of smartphones showed up several times throughout the interviews. Faculty Member 4 mentioned that students who lacked dependable internet access at home sometimes tried to do their work on a smartphone. While using smartphones may seem to be a good way to get around the digital divide at home, Faculty Member 4 noted that smartphones are not compatible with lab

assignments required in their online courses. Faculty Member 4 said some students tried to use their phones as mobile hotspots, causing their monthly cell phone bills to increase. Since cell service does not cover all areas of the county equally, students might have difficulty getting a smartphone to connect to the internet, depending on their location in the county.

Second-Level Digital Divide

RQ2: What are the perceptions of community college students regarding the impact of their digital literacy and their ability to use broadband internet resources to further their educational goals?

The second-level digital divide deals with digital literacy or, in this study's context, the ability of a student to use technology to complete schoolwork online (Dutton & Reisdorf, 2019; Philip et al., 2017; Wei & Hindman, 2011; see Table 3).

Table 3

Perceptions of Digital Literacy and Usage

Question	*Mdn*	Mode	*M*	*SD*
I consider myself to be computer literate.	1	1	0.96	0.99
I am confident in my ability to use a computer and the internet to access schoolwork.	2	2	1.32	0.90
I am confident in my ability to use a computer and the internet to complete schoolwork.	2	2	1.43	0.88
I have the technological skills to successfully complete a course and/or degree program 100% online.	1	1	0.43	0.70
When using a device connected to the internet, I spend most of my time playing games, chatting with friends, or using social media.	-1	-1	-0.50	1.11
When using a device connected to the internet, I spend most of my time doing schoolwork, research, or employment activities (searching for a job, completing an assigned task, etc.).	1	1	0.93	0.96

Note. Strongly Agree = 2, Agree = 1, Neither Agree nor Disagree = 0, Disagree = -1, Strongly Disagree = -2.

This portion of the survey focused on student perceptions of their digital literacy and their ability to use high-speed internet to achieve their educational goals. When presented with the statement, "I consider myself to be computer literate," respondents *agreed* that they consider themselves to be computer literate (see Table 3). This demonstrates a high level of student comfort with completing their assignments online.

When asked if they were confident in their ability to use a computer and the internet to access schoolwork, the average respondent *strongly agreed* with the statement. A similar breakdown occurred when presented with the statement that they have confidence in their ability to use a computer and the internet to complete their schoolwork. Again, most respondents *strongly agreed* with the statement. When asked about their ability to complete a course or degree program 100% online, the confidence of the respondents dropped a little, but the mean demonstrated overall agreement with the statement.

Using the survey, I also investigated how respondents spend their time on the internet. Research on the second-level digital divide demonstrated that some users used the internet for entertainment purposes but were unable to use the internet for activities such as completing schoolwork (Smith, 2015; Wei & Hindman, 2011). When asked about how they spend their time online, most of the respondents *agreed* that they spend most of their time online doing schoolwork, research, or employment activities. Most of the respondents responded negatively to the statement that they spend most of their time online playing games, chatting with friends, or using social media.

Despite the results of the student interviews, the faculty members I interviewed had experience with students who lacked digital literacy. The reasons faculty identified for the lack of digital literacy ranged from student apathy to students thinking an online class would not be

challenging. Several instructors highlighted issues related to a student's overall expectations of college. For example, according to Faculty Member 6, nontraditional students who once took evening classes now take more online classes. According to Faculty Member 3, these students sometimes struggle with the growing complexity of online classes that use publisher materials that require access codes. An example of this problem was provided by Faculty Member 3, who teaches in the nursing program. Some of the nursing students return to school after working as an LPN (licensed practice nurse) or paramedic for several years. These students were sometimes unprepared to tackle the new technologies used in the nursing programs and struggled with accessing online textbooks, logging into the required online testing products, or using online clinical documents. While the student's age is an implied issue in the nursing program, Faculty Member 6 identified the student's age as a factor when it comes to digital literacy. This instructor said their student population has gotten younger because of the growing dual enrollment in online and in-person programs. As a result, they are not seeing as many digital literacy issues as they once did.

While five out of the six faculty members interviewed had experience with students lacking digital literacy, Faculty Member 2 did not have the same experience. When asked about students' digital literacy, they said students sometimes have questions related to confusion over technical language, "but nothing too extreme." This instructor's different experience is likely because they teach in the college's IT program.

Solving Internet Access Problems

RQ3: What are the perceptions of community college students regarding how their access issues to the internet could be overcome?

This portion of the survey examined respondents' efforts to overcome the digital divide's impact on their studies (see Table 4). While the mean shows that some of the respondents *agreed* with the statement that they do not have reliable internet service at home, fewer *agreed* with the statement that they have taken steps to find internet access outside of their home or the college. This is confirmed by the subsequent responses, which showed respondents generally *disagreed* with the statement about using the internet at a friend or family member's home. Respondents responded negatively about local hotspots, using the internet at local businesses, and traveling to the college to use the internet.

Table 4

Solving Internet Access Problems

Question	*Mdn*	Mode	*M*	*SD*
I do not have reliable internet service at home.	1	1	1.14	0.36
I have taken steps to find internet access outside of the home or college.	1	1	0.67	1.53
I have family or friends who have dependable internet access and regularly allow me to use their internet to complete my schoolwork.	-1	-1	-0.33	2.08
Local businesses have internet access I use to complete my schoolwork.	0	0	0	1.41
There are hotspots located around the community where I can access the internet to complete schoolwork.	-1	NA	-0.33	2.08
I depend totally on my smartphone to access the internet to complete my schoolwork.	-1	NA	-1	1.00
I travel to the college campus to access the internet and complete my schoolwork.	-1	NA	-0.67	1.53

Note. Strongly Agree = 2, Agree = 1, Neither Agree nor Disagree = 0, Disagree = -1, Strongly Disagree = -2.

Faculty Interviews

RQ4: What are community college faculty perceptions of the impact of the first- and second-level digital divides on their rural students?

The faculty interviews proved to be a valuable part of this research. While the student surveys demonstrated some general trends, the interviews brought out challenges students had that did not appear as clearly in the surveys. I conducted faculty interviews after the student surveys had been completed. All full-time curriculum faculty at the college were emailed and asked to volunteer to be interviewed for the research. A total of six faculty members were interviewed. The interviews were conducted using Zoom to make scheduling the interviews more convenient and for the interviews to be recorded for later review.

The interview questions focused on both the first- and second-level digital divide. The faculty interviewed generally *agreed* that the digital divide had a negative impact on their students. While Faculty Member 2, who teaches in the IT department, said their students were not struggling with digital access and literacy, other faculty made clear they saw students struggle with the digital divide every semester. Faculty Member 5 found that while some students get frustrated, become apathetic, or quit because of their digital challenges, others seek solutions and find ways to overcome their digital challenges.

The faculty interviews included several questions about how students work to overcome the first- and second-level digital divides. Faculty revealed that students often struggle to locate alternative internet connections outside of the home. The first-level digital divide—the lack of access to the internet and related resources—continues to be a problem for college students in the county. The community college is in a rural community and the nearest town with fast food restaurants is 10 miles away. Several faculty members mentioned McDonald's frequently during interviews. According to Faculty Member 3, the number of students using McDonald's to access the internet must mean it has good WiFi service. McDonald's was a popular WiFi spot during the COVID-19 closures and continues to be popular for students seeking internet access. Despite

its popularity, students cannot use the WiFi anytime. As Faculty Member 6 noted, "They can't just go at two o'clock in the morning and sit in McDonald's parking lot and get on their WiFi. That's not going to happen."

Another location students often visited to overcome the first-level digital divide was the college campus. Several instructors mentioned students coming to campus or staying on campus after class to complete their online assignments. Some student park in the college parking lot and use the WiFi on the weekends. Faculty Member 2, the IT instructor, said some of their students come to campus to use a Mac computer while taking the Apple Swift class. Otherwise, their students have computers and internet access at home.

Other locations students use to access dependable internet service is a friend or family member's house and places of employment. During the interviews, multiple instructors mentioned the lack of reliable public hotspots. Faculty Member 5 pointed out that the county does not have good hotspot service apart from the college, the public library, and McDonald's. While some students do use their phones as personal hotspots, this can cause them to use up the allotted monthly data, forcing them to pay additional money.

The second-level digital divide, or the lack of digital literacy, continues to be a significant problem for students at the college. Since rural communities have less access to dependable high-speed internet (Correa & Pavez, 2016; Salemink et al., 2015), it makes sense that people in rural areas might be more likely to lack some digital literacy skills.

The faculty interviews asked several questions about students' digital literacy and what steps students take to overcome their digital divide. The impact of the second-level digital divide can be seen in the classroom, whether virtual or physical. Instructors said some students get frustrated when they do not understand how to use the technology. This frustration sometimes is

related to a lack of basic computer skills that are necessary to be successful in online education. For example, Faculty Member 4 pointed out that some students do not know how to create a PowerPoint. When the instructor provided directions and a YouTube video to demonstrate to the students how to create a PowerPoint, some tried and were successful, but others took a zero on the assignment. Faculty Member 5 said this frustration could lead students to fall behind in their courses and eventually drop out. Some students develop a self-defeating mindset in which they tell themselves they are not smart enough to grasp the technology, which prevents them from even trying.

The community college has several ways students who are struggling with course technology can reach out for help. Faculty Member 4 mentioned the Learning Enhancement Center, where students can find tutoring and distance learning. However, faculty identified several reasons students sometimes do not take advantage of these resources. According to Faculty Member 3, some students simply do not know what they do not know. These students fail to reach out for help because they think they understand or can figure it out on their own. Faculty Member 5 said some students are intimidated to ask questions because they do not know what questions to ask. Yet another instructor, Faculty Member 6, identified student apathy as the barrier. These students simply refuse to engage in learning the technology.

Even though frustration and apathy prevent some students from trying to overcome their digital challenges, Faculty Member 3 identified ways in which many students seek help. One of the more cited ways students have sought help is by reaching out to their instructors. This instructor said some students reached out to informal leaders that emerged in the class. These peer leaders help their classmates with questions on course content and learning technologies. Students also took advantage of online resources such as YouTube or various on-campus

resources. One faculty member said students tend to be open and assertive when it comes to learning the technology.

Census Data

In addition to student surveys and faculty interviews, I examined census data for the county. The computer- and internet-use sections presented the percentage of households with a computer and broadband internet subscriptions from 2013–2017. The data indicated that during that period, 75% of households in the county had a computer, and 61% of households had broadband internet. Follow-up census data showed a dramatic increase in these percentages. The 2021 report showed a drop in the county's population but a dramatic increase in the number of households with a computer and households with broadband internet subscriptions between 2015–2019. The data showed that 80% of households in the county had a computer, and 70% of households had broadband internet. The 2022 report showed continued improvement. For the years 2020–2021, the data showed that 86% of the county's households had a computer, and 80% of households had broadband internet.

In addition to looking at these data for the county, it was important to compare data concerning computer ownership and broadband internet access for the immediate surrounding counties (see Figure 2).

Figure 2

Households With Computers 2017–2021
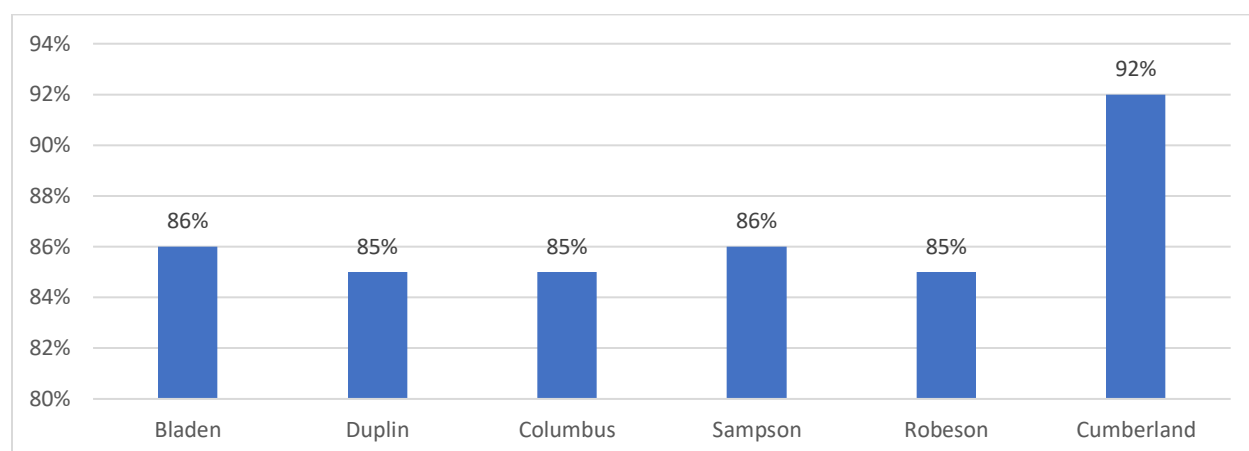
Duplin does not border Bladen County. However, I selected it as a surrounding county since it includes a community college roughly the same size as the college studied. The population of Duplin County as of July 1, 2022, was 48,515. Between 2017 and 2021, 85% of the county's households had a computer, and 73% had broadband internet (U.S. Census Bureau, 2022a).

Columbus County is the adjoining county directly south of Bladen County. Columbus County also has a community college. However, the community college in Columbus County is larger than the college in this study. The population of Columbus County as of July 1, 2022, was 50,092. Between 2017 and 2021, 85% of the county's households had a computer, and 75% had broadband internet (U.S. Census Bureau, 2022b).

Sampson County is the neighboring county directly east of Bladen County. The county has a community college that is slightly larger than the College in this study. The population of Sampson County as of July 1, 2022, was 58,990. Between 2017 and 2021, 86% of the households in the county had a computer, and 74% of the households had broadband internet (U.S. Census Bureau, 2022c).

Robeson County is the neighboring county directly west of Bladen County. The population of Robeson County as of July 1, 2022, was 116,328. Between 2017 and 2021, 85% of the households in the county had a computer, and 67% of the households had broadband internet (U.S. Census Bureau, 2022d).

Cumberland County is the neighboring county directly to the north of Bladen County. Cumberland County's population is significantly larger than Bladen County as it is the home of Fayetteville, Pope Air Force Base, and Fort Bragg. The population of Cumberland County as of July 1, 2022, was 335,508. Between 2017 and 2021, 92% of the households in the county had a computer, and 87% of the households had broadband internet (U.S. Census Bureau, 2022e).

Bladen County is similar to surrounding counties when looking at the percentage of households with computers. The only county that dramatically exceeds Bladen County's percentage is Cumberland County. Since Cumberland County is more urban and has a higher population than Bladen County, this is not surprising.

When comparing households with broadband internet subscriptions, the county that is the focus of this study had greater numbers of households with broadband internet than its neighboring counties, except for the most urban of these counties (see Figure 3). For the county as an issue here, the digital divide improved between 2013 and 2022. This could be because even though the county's population declined, the population's education and median income levels improved. Between 2018 and 2022, the number of residents in the county with a bachelor's degree or higher rose from 14.5% to 17.7%. During the same period, the median household income rose from $32,400 to $39,400, and research has demonstrated that education and income levels directly impact the digital divide (El-Masri & Tarhini, 2017; Lai, 2018; Pick & Sarkar,

2016). Because both indicators have improved, it is not surprising that more residents of the county have both a computer in the home and access to high-speed internet.

Figure 3

Households With Broadband Internet Subscriptions 2017–2021
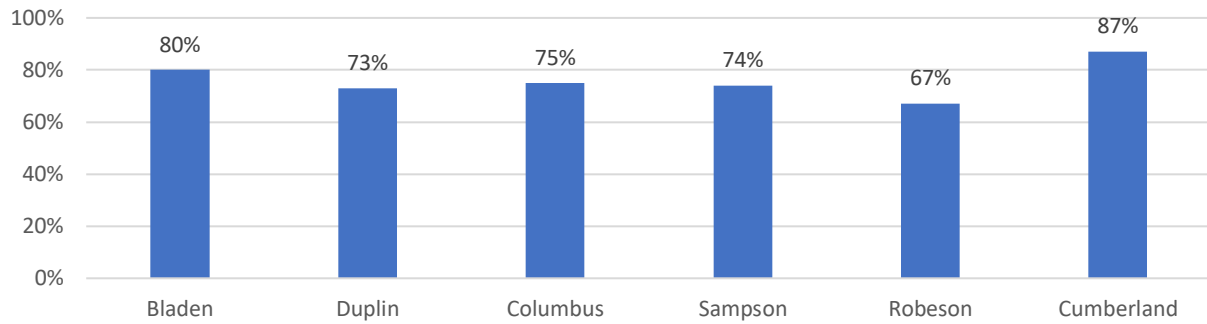
Chapter 5: Discussion, Conclusions, and Recommendations

This study examined the impact of the digital divide on students attending a rural community college in Southeastern North Carolina. This chapter discusses the findings and implications of the student surveys and faculty interviews. Data collected from census reports of the county in which the college is located and from the community college provide a larger context. The chapter also includes a discussion of the following research questions, along with a discussion of the study's limitations and recommendations for additional research.

RQ1: What are the perceptions of community college students regarding their access to the internet and its resources when studying from home?

RQ2: What are the perceptions of community college students regarding the impact of their digital literacy and their ability to use broadband internet resources to further their educational goals?

RQ3: What are the perceptions of community college students regarding how their access issues to the internet could be overcome?

RQ4: What are community college faculty perceptions of the impact of the first- and second-level digital divides on their rural students?

Discussion of Findings

This study's research questions focused on student and faculty perceptions of the digital divide. I measured student perceptions using a survey tool that included questions related to the first three research questions. The final research question focused on faculty perspectives on the impact the digital divide was having on their students. Faculty interviews focused on their perspective on student access to computer technology and high-speed internet, student digital literacy, and the ways in which students have sought to overcome the digital divide.

Research Question 1

Student surveys measured perceptions regarding their access to the internet and its resources when studying from home. When asked whether they *agreed* or *disagreed* with the statement, "I have a dependable computer (laptop or desktop) at home," the survey results demonstrated that most respondents ($M = 1.29$) *agreed* with the statement. This agrees with the latest census data from the county showing that 86% of residents have a computer (laptop or desktop) in the home.

While the median of 1 demonstrated that some students responded to the statement, "I have dependable access to high-speed internet at home," the mean of 1.04 demonstrated many respondents to the survey had high-speed internet access at home. While this result may seem contrary to expectations, the county has seen an increase in the number of households with broadband internet subscriptions. According to the most recent census information, 80% of households in the county now have broadband internet.

The survey data showed that respondents *disagreed* with the statements about not having a computer (laptop or desktop) or high-speed internet access at home. When asked to *agree* or *disagree* with the statement that they do not have either a computer (laptop or desktop) or high-speed internet access at home due to financial reasons, respondents generally *disagreed*. The mean of -1.04, along with the standard deviation (0.88), showed that many respondents did not consider financial issues to be the reason they do not have a home computer or high-speed internet access. However, the standard deviation (1.17) was slightly higher when asked to *agree* or *disagree* with the statement that they have a computer (laptop or desktop) but do not have access to high-speed internet due to financial reasons. The mean also showed less disagreement,

as did the median and mode. This may indicate that some of the respondents had a computer at home (laptop or desktop) but could not afford high-speed internet access.

Because research demonstrated that students who do not have high-speed internet or a computer (laptop or desktop) at home sometimes attempt to complete their schoolwork on a smartphone (Smith, 2015), additional questions in this portion of the survey included several questions regarding using smartphones. Respondents were asked to *agree* or *disagree* with the statement, "I do not have a dependable computer (laptop or desktop) at home, but I do have access to an internet-capable smartphone." The mean, median, and mode all indicated that a slight majority of respondents *disagreed* with the statement. This is in line with census data from the county indicating that 86% of residents have a computer (laptop or desktop) in the home. When asked to select one of the five choices on the Likert scale in response to the statement, "I do not have a dependable computer (laptop or desktop) access to high-speed internet or access to an internet-capable smartphone," the negative response was slightly more certain. This showed that many respondents had access to one or more of the technologies listed in the statement.

Do students complete their coursework using their smartphones? The next three statements in the survey sought to answer this question. The survey results indicated that respondents have not been doing most of their schoolwork using a smartphone. Respondents also indicated they did not find it easy to complete schoolwork using a smartphone and were often frustrated when they tried.

Research Question 2

Student surveys also measured student perceptions regarding the impact of their digital literacy and their ability to use broadband internet resources to further their educational goals. When respondents were asked if they were confident in their ability to use a computer and the

internet to access their schoolwork, the average respondent *agreed* with the statement. Students *strongly agreed* with the statements measuring their confidence in their ability to use a computer and the internet to access and complete schoolwork. However, respondent confidence dropped when asked to *agree* or *disagree* with the statement, "I have the technological skill to successfully complete a course and/or degree 100% online." Though the median, mode, and mean all demonstrated that respondents agreed with the statement, the agreement was not as strong.

Since digital literacy is tied to how a person uses internet access, the survey included two statements on how respondents use their time on the internet. Respondents *disagreed* with the statement that they spend most of their internet time playing games, chatting with friends, or using social media. Not surprisingly, respondents *agreed* with the statement, "When using a device connected to the internet, I spend most of my time doing schoolwork, research, or employment activities."

Research Question 3

The third research question was derived from two applicable theories—STOPS and UTAUT—as discussed in Chapter 2. The corresponding survey items centered around student attempts to overcome the digital divide. I used these to come to a better understanding of how students have responded to challenges.

Several statements on the survey were designed to measure the perceptions of community college students regarding how their access issues to the internet could be overcome. These statements were located toward the end of the survey, and several were not answered by some of the respondents.

In response to an earlier statement on the survey, respondents were asked to *agree* or

disagree with the statement, "I have dependable access to high-speed internet at home." The

mean of agreement to that statement was 1.04, indicating the average respondent *agreed* they had

dependable access to high-speed internet at home. The mode, or the most frequent number in the

responses, was a 2 or *strongly agree*. However, the standard deviation of 1.14 indicated there

was a good amount of variation in the responses. That variation might be seen in this portion of

the survey when respondents were asked to *agree* or *disagree* with the more negative statement,

"I do not have reliable internet service at home." The mean here was 1.14, while the mode was 1.

The standard deviation of 0.36 showed much less variation away from the mean. This could

indicate that the respondents who answered this portion of the survey were more likely not to

have reliable internet at home. Respondents who did have reliable internet at home either

skipped this statement or this portion of the survey.

The remaining statements in this portion of the survey examined how students who

lacked reliable internet service at home sought ways to gain access to the internet. When asked to

agree or *disagree* with the statement, "I have taken steps to find internet access outside of the

home," the mean of agreement was 0.67, and the mode was 1. This indicates that several

respondents selected *neither agree nor disagree* or simply did not respond. The standard

deviation demonstrated a wide amount of variation away from the mean in the responses.

However, among those who did respond to the statement, there was slight agreement that they do

take steps to find internet access outside of the home.

Those respondents who answered this portion of the survey indicated that they did not

regularly use a family member's or friend's internet to complete schoolwork. There was also

disagreement when respondents were asked about using hotspots, smartphones, or traveling to

the college to complete schoolwork. However, these results are unlikely to be dependable because very few respondents answered these statements on the survey, and the standard deviations were high. Faculty interviews indicated that students did, in fact, use family or a friend's internet, hotspots, and college WiFi or computers to complete their coursework.

The survey results were inconclusive and did not provide meaningful insights into how students sought to overcome the digital divide. However, a review of how some students sought to overcome digital challenges showed that many used aspects of the STOPS. These students identified a problem that prevented them from being successful in their studies. In this case, that problem was the first- and second-level digital divide. Once students identified the digital divide as a barrier to their success, some seemed to give up and walk away, while others sought solutions. This represents STOPS at its most basic level. Students engage in information seeking and information attending (Kim & Grunig, 2011). They engage in information seeking by reaching out to instructors, peers, college resource personnel, and doing research online. Many students demonstrated a willingness to act on the information they learned. For example, they heard a classmate talk about the WiFi at the local McDonald's or found a friend or family member with dependable internet access. As one instructor said during the interviews, students tend to be open and assertive when trying to overcome their digital challenges.

Students may have also engaged in more information attending. Even though this was not mentioned in the student surveys or faculty interviews, students can pick up solutions to their digital problems by watching other students or by listening to an instructor assist a peer. While students actively seek information or passively attend to available information, they may also communicate their challenges and solutions with others to increase "common knowledge" and enhance collective problem solving (Kim & Grunig, 2011).

Research Question 4

In addition to student surveys, several faculty members were interviewed to gain a better understanding of faculty perceptions on how the digital divide was impacting rural students at the community college. Faculty responses demonstrated more concerns about the impact of the digital divide than the student surveys.

During the interviews, faculty indicated that the first-level digital divide continues to be an issue among students at the college. The main predictors of whether a student would have access to high-speed internet were location within the county and the student's socioeconomic status. When it comes to how students work to overcome the digital divide, faculty indicated that students who lacked access to high-speed internet at home would often attempt to do their work on a smartphone, at a friend or family member's home, at the college, or at the local McDonald's. While each of these workarounds seemed to help, according to faculty, students continue to struggle mostly because none of these solutions provide the same type of access as having high-speed internet in the home.

In addition to continued issues with the first-level digital divide, interviewed faculty said students have continued to struggle with the second-level digital divide. This struggle with competently and efficiently using computer technologies, operating systems, and software causes some students to fall behind in their work and eventually drop out. The reasons faculty indicated that students sometimes struggle with digital literacy included student apathy toward technology, incorrect assumptions about the difficulty of online learning, and encountering unfamiliar technologies in online classes.

The faculty interviews suggested that more students continue to struggle with both the first- and second-level digital divides than the student surveys indicated. Possible reasons for the

different perspectives between faculty interviews and student surveys are that faculty interact
with more students, and the students responding to the survey might have been more digitally
connected than students who did not respond. It is also possible that students were not
completely honest in their responses to the survey.

Faculty responses indicated that the STOPS and the UTAUT do help explain ways in
which students seek to overcome the impact of the digital divide on their studies. While
attempting to overcome the first-level digital divide, students sought out locations to access the
internet, problem solving behaviors predicted by STOPS. These locations included the local
McDonald's, WiFi at the college, the college's various computer labs, or the internet at the
homes of friends and family. While each of these solutions has potential drawbacks, the solutions
do indicate that students were identifying their digital limitations and seeking out ways they can
overcome those limitations.

The UTAUT is not often used in the context of studying the digital divide because of the
difficulty of obtaining the necessary user information (Pick & Sarkar, 2016). This research was
unable to examine UTAUT directly because none of the respondents who agreed to be
interviewed were available for a follow-up interview. The one aspect of UTAUT that can be
helpful is effort expectancy or the perceived difficulty of using technology (El-Masri & Tarhini,
2017). The level at which respondents agreed or disagreed with statements related to the effort
they take to overcome the digital divide tells us a little about how much the divide is impacting
their studies.

In this study, the application of UTAUT could not be clearly identified by looking at the
student surveys. However, the faculty interviews did reveal several aspects of the theory because
it hypothesizes that the acceptance and use of technology can be impacted by several factors—

performance expectancy, effort expectancy, social influence, and facilitating conditions (Lai, 2018).

Performance expectancy is the degree to which a person believes a technology will be useful to them. It is connected to a person's willingness to adopt and use a technology and plays an important role in the adoption and use of technology in older adults (El-Masri & Tarhini, 2017; Lai, 2018). Faculty interviews revealed that some nontraditional students who had been away from school for a period sometimes struggled with new educational technologies. While this could lead to frustration for some students, other students sought help from their instructors or peers in their classes.

Effort expectancy is how the perceived difficulty of using a technology impacts a person's willingness to engage with the technology. This can be an important barrier for students who lack digital literacy (El-Masri & Tarhini, 2017). Faculty stated that some students demonstrated apathy or frustration when dealing with technology. Such frustrations could indicate that these students thought the effort of overcoming their digital challenges was not worth the work. Other factors appeared to encourage other students to overcome their limitations.

In relation to social influence, a person's family and peers can play a role in their acceptance and use of technology (Lai, 2018). As an example of social influence, faculty indicated that some students sought out peer leaders to get solutions to their digital challenges. This could also be an example of students using information seeking. According to STOPS, information seeking occurs when a person identifies a problem and begins actively seeking out information to help them solve the problem (Kim & Grunig, 2011).

UTAUT theorizes that various facilitating conditions might impact a person's acceptance and use of technology. These conditions might include socioeconomic status, age, and race (El-Masri & Tarhini, 2017; Lai, 2018; Pick & Sarkar, 2016). While race was not mentioned in the faculty surveys, a student's socioeconomic situation and age were mentioned as facilitating conditions. One faculty member interviewed said there exists an economic divide that creates a digital divide between the haves and the have-nots. The have-nots are the students who cannot afford a home computer, iPad, iPhone, or high-speed internet access. These digital limitations can follow a student throughout their educational career.

Two faculty members mentioned the facilitating condition of age. Nontraditional students who had been away from school for several years often struggled with accessing online textbooks, registering for the required online testing products, or using online clinical documents. One instructor said that as their student population has gotten younger, they were seeing fewer digital literacy issues.

In addition to age and race, living in a rural community can be a facilitating condition (El-Masri & Tarhini, 2017). Several faculty members indicated that where a student lives in the county could determine whether the student had high-speed internet access. Two faculty indicated they struggled with internet access because they lived in rural areas of the county. Even the use of smartphones can be limited because cell tower service does not cover the entire county.

Discussion of Student Survey and Faculty Interview Findings in Relation to Past Literature

The findings of this research demonstrated that while there has been some progress in bridging the digital divide in the county and among community college students, the divide remains. Both the first- and second-level digital divides continue to impact adult students at the

college. This section places the findings of this research into the larger context of previous research on the impact of the digital divide on rural communities.

First-Level Digital Divide

In 1995, the U.S. Department of Commerce released a report titled "Falling Through the Net: A Survey of the "Have-Nots" in Rural and Urban America" (McConnaughey et al., 1995). This was the first of several reports examining the impact of the digital divide. The report demonstrated a sharp divide between rural and nonrural residents in terms of computer and modem penetration (McConnaughey et al., 1995). Rural areas were identified as disproportionately among the have-nots when it came to the digital divide. The report is important because it was the first such report published during a time in which the importance of owning a personal computer was growing. People needed access to personal computers and the information highway to stay caught up with the technological innovations occurring in society.

The 1998 follow-up report found a dramatic increase in personal computer ownership and internet access and usage (Katsinas & Moeck, 2002). However, the report also found that between 1994 and 1997, there was an increase in the digital divide and even greater disparity in penetration levels among some groups (McConnaughey & Lader, 1998). Rural areas of the country continued to lag in computer ownership and internet access. In addition to geography, education levels, income, race, and age, all played a role in who were the haves and who were the have-nots.

The 1999 follow-up report reached many of the same conclusions as the 1998 report. The digital divide remained an issue for rural residents (McConnaughey et al., 1999). The 2000 report showed a dramatic increase in the number of Americans with internet access in the home. It was also the first of the reports to include data on high-speed internet access. According to the

report, digital access has improved in every area of concern, including geography. Despite the good news in the report, it also noted that "a digital divide remains or has expanded slightly in some cases, even while internet access and computer ownership are rising rapidly for almost all groups" (Katsinas & Moeck, 2002; Rohde & Shapiro, 2000, p. 16). Rural areas lagged behind both cities and urban areas in the penetration of high-speed internet access (Katsinas & Moeck, 2002; Rohde & Shapiro, 2000).

The data collected for this research demonstrated that there has been some progress in bridging the digital divide in the county and among the county's community college students. This progress can be seen in the student surveys and county census data. Survey statements regarding computer (laptop or desktop) access in the home and high-speed internet access in the home both indicated overall agreement among respondents. The county census data reflects this improved situation, with 80% of county households having broadband internet access and 86% of county households having a computer.

However, the first-level digital divide has not been fully overcome. Interviews with faculty members demonstrated students continue to struggle with a lack of computer and high-speed internet access at home. These findings fit well with previous literature on the first-level digital divide and rural communities. Progress is being made, but there is more that needs to be done to close the access gap.

Second-Level Digital Divide

Since 2002, the digital landscape has changed how researchers conceptualize the digital divide. Researchers no longer think of the digital divide simply in terms of access. While access continues to be an issue in rural communities, a major impact of the digital divide is now digital literacy. This shift represents a conceptual change in how researchers view the challenges of the

digital divide (Roberts et al., 2017; Silva et al., 2018; Wei & Hindman, 2011; Zhao & Elesh, 2007).

This second-level digital divide is driven by many of the same factors that drive the first-level digital divide. Income, education, race, geography, and household makeup, continue to be important indicators of equal access and digital literacy (Hohlfeld et al., 2017; Philip et al., 2017; Silva et al., 2018; Wei & Hindman, 2011; Zhao & Elesh, 2007). Simply because a person has a computer and high-speed internet access in their home does not mean they know how to benefit from its use.

The data collected through the student surveys presented a picture slightly different from previous research. Respondents to the survey demonstrated a high level of confidence in their ability to use a computer and the internet to access and complete their schoolwork. These findings may not be meaningful because the students responding to the survey may have been more digitally literate than students who did not respond to the survey.

Faculty interviews provided an important balance to the student survey results on the second-level digital divide. According to the faculty I interviewed, students have struggled with the second-level digital divide because they are apathetic, they are not being prepared for how the role of technology in education has changed since they were last in college, or they think an online class would not be challenging.

Limitations

This research has several limitations. First, this research is a case study of the impact of the digital divide on students enrolled at one rural community college in Southeastern North Carolina. While census information from surrounding counties was considered, the research did not include students or faculty at any other community college. Therefore, the results of this

research have limited transferability to other colleges and contexts. In addition, this research only included adult curriculum students living in Bladen County. Early college, dual-enrolled high school students, and adult continuing education students were not included in the research. A third weakness is the lack of student interviews. While several students did indicate that they would like to be interviewed, none responded to follow-up requests for an interview. This means that the perspective of students was limited to the survey results. Finally, the digital nature of the survey may have excluded some students who did not have access to high-speed internet at home or who lacked digital literacy.

Recommendations for Future Research

The results of this research provide a snapshot of the impact of the digital divide on rural community college students attending the rural county's community college. Additional research to determine the impact of the digital divide on rural community college students attending other colleges in the state would provide more data on the challenges presented by both the first- and second-level digital divides on this population. In addition, further research should be done on the ways in which rural community college students work to overcome the digital divide.

Additional research on the impact of the digital divide on rural community college students in North Carolina should include early college and dual enrollment students. A February 2023 report to the General Assembly of North Carolina indicated that nearly 70,000 high school students in the state were involved in dual enrollment programs during the 2021–2022 school year (Edmunds et al., 2023). This number includes high school students in career and college promise transfer programs, career technical education programs, and early college programs. Considering the digital challenges facing adult curriculum students at the community college,

there is good reason to believe the large and growing population of high school students enrolled in community colleges and early colleges in rural areas are facing similar challenges.

Conclusions

This research demonstrates that the digital divide continues to be a challenge for rural community college students. However, there have been important improvements in access to high-speed internet in rural communities. Student surveys, faculty interviews, and census data all demonstrate that while challenges remain in relation to the first-level digital divide, significant improvements have been made over time.

This research also demonstrates that digital literacy remains a significant challenge for rural community college students. Despite improvements in broadband internet access, rural community college students continue to face challenges with the second-level digital divide. Students struggle with basic digital skills such as creating a PowerPoint and the growing complexity of online classes that require publisher access codes to course materials and textbooks. Nontraditional students returning to school after working for several years are sometimes unprepared for the new technologies being required in their programs.

Rural community college students who lack digital access at home find various ways to overcome that barrier. Whether it is using WiFi at a local fast food restaurant, the college's WiFi or computer labs, smartphones, or friends and family, students find ways to complete their schoolwork despite lacking high-speed internet access at home. This research also demonstrates that STOPS and UTAUT do help explain how students seek to overcome the digital divide and the various factors that can impact student's acceptance and use of technology.

Faculty interviews provided a different perspective on the impact of the digital divide than the student surveys. The interviews demonstrated that faculty witness students struggling

with both the first- and second-level digital divides. While there are students who continue to struggle with digital access, the second-level digital divide is a major struggle for rural community college students.

Faculty interviews were also able to provide helpful explanations as to why some students have struggled to overcome those challenges. Whether it was student apathy, geography, or being unprepared for emerging educational technologies, the faculty interviews showed that students often face barriers when trying to access and complete their schoolwork. The faculty interviews also confirmed that STOPS and UTAUT clarify the factors that impact a student's acceptance and use of technology and how they work to overcome the digital divide.

Since digital literacy includes a person's ability to use technology to achieve their goals (Demirtas, 2023) and "improve learning, productivity and performance" (Reddy et al., 2023, p. 7), students who continue to struggle with the second-level digital divide face significant challenges in achieving their educational goals. In fact, those challenges are not likely to end for these students after graduation. The growing digital complexity of society and work along with the need to use different technologies will require digital literacy. Individuals who lack digital literacy skills will find that lack negatively impacting their lives (Saputra & Siddiq, 2020).

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Appendix A: IRB Approval Letter

ABILENE CHRISTIAN UNIVERSITY

Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
328 Hardin Administration Building, ACU Box 29145, Abilene, Texas 79699-9145
325-674-2885

June 28, 2022

Merlin Ray Sheppard
Department of Graduate and Professional Studies
Abilene Christian University

Dear Ray,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled
"The Impact of the Digital Divide on Rural Community College Students",

(IRB# 22-064) is exempt from review under Federal Policy for the Protection of Human Subjects. If at any time the details of this project change, please advise our office of the change(s) by email, so that the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work!

Sincerely,

Russell P Kruzelock

ACU Vice President of Research

Additional Approvals/Instructions:

WAIVER OF DOCUMENTATION OF CONSENT, based on the following justification:

* The research presents no more than minimal risk of harm to subjects, and involves no procedures for which written consent is normally required outside of the research context.

The following are all responsibilities of the Primary Investigator (PI). Violation of these responsibilities may result in suspension or termination of research by the Institutional Review Board. If the Primary Investigator is a student and fails to fulfil any of these responsibilities, the Faculty Advisor then becomes responsible for completing or upholding any and all of the following:

• If there are any changes in the research (including but not limited to change in location, members of the research team, research procedures, number of participants, target population of participants, compensation, or risk), these changes must be approved by the IRB prior to implementation.
• Report any protocol deviations or unanticipated problems to the IRB promptly according to IRB policy.
• Should the research continue past the expiration date, submit a Continuing Review Form, along with a copy of the current consent form and a new Signature Assurance Form approximately 30 days before the expiration date.
• When the research is completed, inform the Office of Research and Sponsored Programs. If your study is Expedited or Full Board, submit an Inactivation Request Form and a new Signature Assurance Form. If your study is Exempt, Non-Research, or Non-Human Research, email orsp@acu.edu to indicate that the research has finished.
• According to ACU policy, research data must be stored on ACU campus (or electronically) for 3 years from inactivation of the study, in a manner that is secure but accessible should the IRB request access.
• It is the Investigator's responsibility to maintain a general environment of safety for all research participants and all members of the research team. All risks to physical, mental, and emotional well-being as well as any risks to confidentiality should be minimized.

For additional information on the policies and procedures above, please visit the IRB website
https://odn01.acu.edu/community/offices/academic/orsp/human-research/overview.html
or email orsp@acu.edu with your questions.

Our Promise: ACU is a vibrant, innovative, Christ-centered community that engages students in authentic spiritual and intellectual growth, equipping them to make a real difference in the world.

Appendix B: Student Survey

The survey students will receive via email will be sent using Survey Monkey. Each of the questions in the survey will be tied directly back to the research questions identified earlier in this research. The survey ties each of the questions to the specific research question. Respondents will not see the research questions in the actual questionnaire.

Research Question 1: What are the perceptions of community college students regarding their access to the Internet and its resources when studying from home?

1. I have dependable access to high-speed Internet at home.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

2. I have a dependable computer (laptop or desktop) at home.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

3. I have a dependable computer (laptop or desktop) at home but do not have access to high-speed Internet due to financial reasons.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

4. I have a dependable computer (laptop or desktop) at home but do not have access to high-speed Internet because it is not available where I live.

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

5. I have a dependable computer (laptop or desktop) at home but do not have access to high-speed Internet because of personal convictions.

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

6. I do not have a dependable computer (laptop or desktop) at home, nor do I have access to high-speed Internet due to financial reasons.

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

7. I do not have a dependable computer (laptop or desktop) or access to high-speed Internet at home, but I do have access to an Internet-capable smartphone.

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

8. I do not have a dependable computer (laptop or desktop), access to high-speed Internet, or access to an Internet-capable smartphone.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

9. I do most of my schoolwork using a smartphone.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

10. It is easy for me to complete my schoolwork using a smartphone.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

11. I am often frustrated when trying to complete schoolwork using my smartphone.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

12. I am frustrated by a lack of Internet access and/or up-to-date technology when trying to complete my schoolwork at home.

   a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

Research Question 2: What are the perceptions of community college students regarding the impact of their digital literacy and their ability to use broadband Internet resources to further their educational goals?

1. I consider myself to be computer literate.

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

2. When using a device connected to the Internet, I spend most of my time playing games, chatting with friends, or using social media.

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

3. When using a device connected to the Internet, I spend most of my time doing schoolwork, research, or employment activities (searching for a job, completing an assigned task, etc.).

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

4. I am confident in my ability to use a computer and the Internet to access schoolwork.

a. Strongly Disagree

b. Disagree

c. Neutral

d. Agree

e. Strongly Agree

5. I am confident in my ability to use a computer and the Internet to complete schoolwork.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

6. I have the technological skill to successfully complete a course and/or degree program 100% online.

   a. Strongly Disagree

   b. Disagree

   c. Neutral

   d. Agree

   e. Strongly Agree

Research Question 3: What are the perceptions of community college students regarding how their access issues to the Internet could be overcome?

If you do not have access to dependable Internet services at home:

1. I don't have access to dependable Internet access at home due to:

   a. Economic reasons.

   b. It is not available where I live.

   c. Never have tried to get access.

   d. Other.

2. I have taken steps to find Internet access outside of the home or college.

   a. Strongly Disagree

   b. Disagree

    c.   Neutral

    d.   Agree

    e.   Strongly Agree

3. I have family or friends who have dependable Internet access and regularly allow me to use their Internet to complete my schoolwork.

    a.   Strongly Disagree

    b.   Disagree

    c.   Neutral

    d.   Agree

    e.   Strongly Agree

4. Local businesses have Internet access I use to complete my schoolwork.

    a.   Strongly Disagree

    b.   Disagree

    c.   Neutral

    d.   Agree

    e.   Strongly Agree

5. There are hotspots located around the community where I can access the Internet to complete schoolwork.

    a.   Strongly Disagree

    b.   Disagree

    c.   Neutral

    d.   Agree

    e.   Strongly Agree

6. I depend totally on my smartphone to access the Internet and complete my schoolwork.

    a.   Strongly Disagree

    b.   Disagree

    c.   Neutral

    d.   Agree

    e.   Strongly Agree

7. I travel to the college campus to access the Internet and complete my schoolwork.

    a. Strongly Disagree

    b. Disagree

    c. Neutral

    d. Agree

    e. Strongly Agree

Appendix C: Interview Questions Selected Faculty

Following the student surveys, faculty members will be interviewed to obtain their perspectives on how the digital divide is impacting their students. All College faculty who teach online, hybrid, or blended courses will be invited to participate in these interviews. Only a select number of faculty will be chosen for an interview.

Each interview question will be tied directly back to Research Question 4: **What are community college faculty perceptions of the impact of the first- and second-level digital divides on their rural students?** Follow-up questions will be asked as needed and documented.

1. How would you (personally) define the digital divide?

2. How impacted are you (personally) by the digital divide?

3. How often do you have students in your online, hybrid, or blended classes that do not have Internet access at home?

4. In your experience, how big of a problem is the lack of Internet access among college students in Bladen County?

5. Do you believe the digital divide is a more significant problem in rural areas than in urban (less rural) areas? If so, what factors do you believe contribute to the digital divide among rural college students?

6. How do your students who lack home Internet access gain access to the Internet?

7. Do students have enough access to hotspots located around the community where they can access the Internet to complete schoolwork?

8. Do online students understand they can travel to the college campus to access the Internet and complete their schoolwork? If so, how often do students who do not have Internet access at home travel to the campus for the sole purpose of completing their schoolwork?

   a. Is the distance to the campus a barrier for some students?

   b. Is transportation a barrier for some students?

9. How often do you deal with students who lack basic digital literacy?

   a. In your opinion, why do you think these students take online, hybrid, or blended classes?

10. In your experience, what factors contribute to this lack of digital literacy?

11. In your experience, how do students attempt to overcome their lack of digital literacy? If they don't, what factors do you believe prevent them from trying to solve the problem?