Videoconference Use Predictors and Dynamics in Alabama's Blackbelt Region

by

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A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
August 3, 2024

Keywords: videoconference, computer self-efficacy, technology acceptance model, digital divide, Blackbelt region

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Abstract

Utilizing videoconference platforms has become the norm for work and personal use. However, many adults need help accessing and using videoconference system platforms. The demographics with low videoconference system access and use numbers are adults living in low socioeconomic rural (LSR) communities such as Alabama's Blackbelt Region. The Alabama Blackbelt region is one of the poorest areas in the country, characterized by a predominantly African American population. LSR communities' use in technology is low due to several factors in the digital divide concepts such differences in digital skills and affordability of the internet. This study explores the dynamics behind LSR communities in rural Alabama's use with videoconference system platforms. This study seeks to gain insight and understanding into the predictors and dynamics behind the relationships between computer self-efficacy (CSE) and the Technology Acceptance Model 2 (TAM2) constructs in videoconferencing use among individuals living in the Blackbelt Region of Alabama. Two hundred and ninety-five adult participants residing in Macon County, Alabama, were surveyed during this study using a convenience sample. Results showed significant interactions with CSE among age, education attainment, and income levels. In addition, only actual use (AU), attitude towards use (ATT), and perceived ease of use (PEOU) were significant predictors of perceived levels of CSE among participants residing in Macon County, AL. Although these results show significant interactions, more research is needed on videoconference systems and the dynamics that affect their use in the Blackbelt region. The implications of videoconference systems research within the Blackbelt region have the potential to help significantly narrow the digital divide adding to research on technology use in low socio-economic rural populations.

Acknowledgments

First, I acknowledge my Lord and Savior, Jesus Christ, for all things are possible with Him. I thank all my committee members for their guidance throughout the process. I wholeheartedly thank Dr. Cordie for serving as chair, for her consistent presence, and for being committed to my success. Next, I thank my family for your love and for being my anchor from the beginning. These individuals include Lennon Sullen Sr., Janet Sullen, Tiffany Williams, Lennon Sullen, Jr., Janet Langford, Derrick Hooks, Jr., Dr. Tajuan Sellars, Rev. Eugene Johnson, Crystal Johnson, Jayvonte Grant, and Jamell Newton. Next, I sincerely thank my work colleagues (Dr. Molly Gregg, Dr. Celvia Stovall, Dennis Williams, Izette McNealy, Shannon Andreas, Trenisha Mack, Ciji Griffin, Danielle Rudolph, Gladys Blythe, Deborah Voltz, Beverly Lee, Donna Allen, Dr. Tony Cook, and John Pulliam). You have been the push to keep me motivated on those long consecutive workdays. The following organizations I acknowledge for your unwavering encouragement: the Alpha Nu Lambda Chapter of Alpha Phi Alpha Fraternity, Inc., Tuskegee Optimist Club, Washington Chapel A.M.E. Church, Damascus Missionary Baptist Church, and the Tuskegee United Women's League. Finally, I want to thank my 4-H family, including youth, teachers, and volunteers I have enjoyed serving. Serving our youth has inspired me to strive for excellence and be an excellent example of a black male raised in the heart of the Blackbelt Region—historic Tuskegee, Alabama—who can achieve whatever he dreams.

In loving memory of Mrs. Elaine Thomas (Grandmother), Mrs. Mattie B. Sullen (Grandmother), Mrs. Sharon Sullen (Aunt), Mr. Vester Marable (Dear Friend), and Mrs. Gladys Blythe (Work Mom).

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List of Abbreviations

ATT	attitude to use
AU	actual use
BI	behavioral intention to use
CSE	computer self-efficacy
LSR	low socioeconomic rural
PE	perceived enjoyment
PEOU	perceived ease of use
PU	perceived usefulness
SES	socioeconomic status
SN	subjective norm
SPSS	statistical product and service solutions
TAM	technology acceptance model

CHAPTER I: OVERVIEW OF THE STUDY

Introduction

The COVID-19 pandemic has altered videoconference use by thrusting this technology into the spotlight. On the last day of 2019, the WHO Country Office in China was notified of a cluster of cases of novel viral pneumonia of unknown cause in Wuhan City, Hubei province (Carvalho et al., 2021). Two months later, the first description of 41 patients with what we now term COVID-19 in Wuhan listed the most common symptoms at the onset of the disease as fever, cough, myalgia, and fatigue (Huang et al., 2020).

Although the vaccine was created in record time, the COVID-19 pandemic has gripped countries and economies worldwide. In response to the rapid spread of the virus, thousands of deaths, and expected exponential growth, many countries entered "lockdown" (Frank & Grady, 2020). Lockdowns mandated staying home, shutting businesses, working from home, and avoiding physical contact with others. Virtual learning and videoconference use became the model for many organizations and institutions to engage their employees, students, and clients. During the lockdowns of 2020, face-to-face interactions were replaced by videoconference system platforms such as Zoom, Google Meets, and Skype. The demand for videoconference systems grew by 90% due to businesses and schools facilitating normal communication between family and friends (Trueman, 2020).

Although utilizing videoconference platforms became the norm for work and personal use, many found it difficult to access and use videoconference system platforms. Among the demographics with low videoconference system use are several adults living in low socioeconomic rural (LSR) communities such as Alabama's Blackbelt Region. Many populations in low socioeconomic rural areas struggle using technology and videoconferencing

(Ratcliffe et al., 2016). As society transitions to videoconference options and away from traditional face-to-face modes, it is important to understand the influence of videoconference use on this demographic and how these adults both access and use these systems.

Background

The Blackbelt of the Deep South, with rural areas in Alabama, Georgia, and Mississippi, has historically faced challenges with rural isolation, limited industry and financial services, poor healthcare options, and lack of educational opportunities (Stewart & DeRonck, 2020). Other features of the area include rural decline, substandard quality of life, and poor economies. The Blackbelt of Alabama is a strip of prairie soil that curves from the Eastern central part of the state to Western central Alabama. Montgomery, Selma, Linden, Marion, Greensboro, Eutaw, Livingston, Camden, and Union Springs area bordered on the North and South. The characteristic black soil was formed by mixing soft lime-stone base rock with the humus of the surface (Sisk, 1953).

Alabama's Blackbelt region is one of the poorest in the United States. While the overall state of Alabama's unemployment rate is improving, the state's Blackbelt counties are also not showing any growth in employment (Howell et al., 2014). Alabama's Blackbelt contains numerous LSR communities. The ramifications of digital divide elements result in low use of technology in LSR communities. From the end of the 1990s onwards, the digital divide, commonly defined as the gap between those who have and do not have access to computers and the Internet, has been a central issue on the scholarly agenda of new media development (van Dijk, 2006). In response, many researchers have shifted attention to a second-level digital divide (Hargittai, 2002), which includes investigating persistent differences in skill, motivation, and cultural norms of use, as these differences continue to shape the experience and benefits of being

online (Hargittai & Hinnant, 2008). This means that the users' abilities are a factor in how successful they are utilizing online programs and their ability to learn/succeed online. For instance, some individuals choose not to be online. This is labeled a form of motivational access driven by cultural and psychological factors (van Dijk, 2006). Another area of the digital divide has been described as the lack of adoption. Lack of adoption may be due to a lack of perceived relevance for that community and norms about what is appropriate (Porter & Donthu, 2006) or fear of the Internet as dangerous (Joiner et al., 2007). Such reasoning can include privacy concerns, cybersecurity threats, misinformation, digital addiction, online scams, impact on mental health, and fear of the unknown. However, while these fears may be valid, many positive aspects of the internet, such as communication, education, and access to information, also exist. This positive aspect can enhance the quality of life in LSR communities by providing access to information and resources necessary for advancement in today's technologically dependent society.

Access to technology in low-income communities is confounded with broader resources, limitations, and ongoing struggles associated with poverty and social inequality (Ragnedda & Muschert, 2013). With videoconferencing becoming more common and replacing face-to-face contacts, it is crucial for technology acceptance studies to aggressively tackle the digital divide gap in LSR communities (University of Chicago Data Science Institute, 2021). This research is necessary because understanding the full scope of use of various technologies among different demographics can serve as a helpful tool for tailoring technology to meet the needs of underserved populations and perhaps aid in reducing the digital divide.

Statement of the Problem

Although extensive studies have shown low use of technology among low socioeconomic communities, very few studies have examined the use of videoconference technology (Galperin & Viecens, 2017; Huang, 2002; McDonough, 2016; Merriam & Caffarella, 1991). The digital divide among LSR communities is expected to widen as videoconferencing becomes the new normal. Access to the internet in many rural areas of the US has been virtually nonexistent or extremely limited, which has been difficult for decades (Perrin, 2019). This divide became more acutely highlighted during the COVID-19 pandemic when getting online became compulsory for everyday life (Aissaoui, 2022). Due to internet access, this problem becomes more complex and compounded when people in low socioeconomic areas reside in rural communities. Even before the COVID-19 pandemic, the lack of internet access among those of low socioeconomic status in rural communities had arguably shaped their views on the value of internet-associated technology. To better understand and address these disparities, it is essential to examine theoretical frameworks and models that explain technology adoption and usage behaviors.

Theoretical Frameworks and Models

The theoretical framework employed in this study plays a crucial role in guiding the research process, encompassing the stages of conceptualization, interpretation, and the overall advancement of knowledge. The study encompasses various frameworks, including Andragogy, Technology Acceptance Model 2 (TAM2), and computer self-efficacy (CSE). Andragogy, the approach and implementation of educating adult learners, is essential for examining the use of videoconferencing in low socioeconomic rural regions due to its emphasis on self-directed learning, practical relevance, and immediate application (Knowles et al., 2015). Comprehending andragogy enables the customization of videoconferencing education to suit the requirements

and circumstances of adults, thereby improving their level of involvement and the overall efficacy of the instruction (Merriam, 2001). This strategy guarantees that the deployment of technology is in line with the learning preferences of adults and enhances educational results in places that lack sufficient resources. Computer self-efficacy (CSE), which refers to an individual's confidence in their capacity to effectively use computer technology, plays a vital role in examining the utilization of videoconferencing in low socioeconomic rural populations (Hsu & Chin, 2004). The perception and use of technology by persons are influenced by this factor, which affects their inclination to embrace and utilize videoconferencing systems efficiently (Compeau & Higgins, 1995). Having a strong belief in one's abilities, known as high self-efficacy, may significantly improve the results of learning and communication. This is particularly important for empowering adult communities via the use of technology.

Research Questions

The following questions will be examined in this study:

1. Does the educational level attained have a significant effect on computer self-efficacy?
2. Are there any significant relationships between computer self-efficacy (CSE) and age among individuals in Macon County?
3. Does income level have an effect on computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?
4. Does perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention to use (BI), attitude to use (AI), actual use (AU), and subjective norm (SN) of videoconference systems together predict computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?

Study Methodology

The study used quantitative methodology to determine if there is a significant difference in videoconference use predictors among individuals living in Alabama's Blackbelt Region. The study surveyed 275 adult residents living in Macon County, Alabama, using modified questionnaire designs that included the Technology Acceptance Model 2 (TAM2) (Salloum et al., 2019; Venkatesh & Davis, 2000) and the computer self-efficacy model (CSE) (Compeau & Higgins, 1995). Demographic data gathered included age, income level, and education attained. Obtaining these demographic data provided valuable insights into participants' characteristics, behaviors, and needs. This study aimed to understand the relationship between computer self-efficacy (CSE) and Technology Acceptance Model 2 (TAM2) variables in videoconferencing systems among adults living in the Blackbelt Region of Alabama. The target population included adults in Macon County, Alabama, with convenient sampling for low socioeconomic status (LSR) and low socioeconomic (SES) communities. Data were analyzed using Statistical Product and Service Solutions (SPSS) software, including linear regression and multiple linear regression analysis to reflect significant interactions. ANOVA was used to analyze the variability between groups and within groups to determine if observed variations in means are statistically significant beyond what would be expected by random chance.

Purpose of the Study

This research aims to investigate how people living in the Blackbelt Region of Alabama use videoconferencing technology and the components that may be used to anticipate how they would utilize it. In addition, the purpose of the research was to analyze how the interactions between characteristics such as age or income impact conceptions. Having a better understanding of these interactions can contribute to the ongoing study on the adoption of technology and

provide more insights into the use of videoconferencing among those who live in communities with low socioeconomic status. There is a paucity of studies investigating technology's impact on the use of videoconferencing. According to Salemink et al. (2017), these results are especially relevant for research projects that include groups with low socioeconomic status and rural areas.

Significance of the Study

The broader aim of this study was to contribute to the knowledge base by examining the technology acceptance model constructs, information success model constructs, and general self-efficacy among a demographic with little research. Studying outcomes among low socioeconomic rural communities provides more insight into increasing videoconference use. Hopefully, the results of this study will raise awareness among other researchers so that they can continue similar in-depth studies on other populations.

Videoconference stakeholders in the educational and support arenas would benefit from this research by applying findings to technology and program designs. Videoconference stakeholders include businesses and corporations using the technology for remote work and meetings (Marler, 2020), educational institutions for virtual learning (Borup et al., 2014), healthcare providers for telehealth services (Wade et al., 2016), government agencies for public services (Carter & Belanger, 2005), and technology providers developing videoconferencing solutions (Dennis et al., 2008). These stakeholders are integral to the effective deployment and utilization of videoconferencing technologies. A proactive approach to addressing construct predictions in LSR communities could help reverse digital divide trends. Reversing digital divide trends in low socio-economic rural communities is essential for promoting equity, economic development, education, healthcare access, civic participation, and social inclusion. By ensuring that all individuals have access to digital tools and resources, more opportunities for growth,

development, and empowerment in these communities can be developed. In addition, educational stakeholders who desire to expand broadband high-speed internet connections in LSR communities could use findings from this and similar studies to help increase buy-in and successful adaptation of videoconferencing and related technology. As today's society continues to move towards videoconference meetings and away from traditional face-to-face meetings, underserved, low-income, and rural communities must be able to and willing to utilize this technology in order to navigate modern, adult life.

Limitations and Delimitations of the Study

It is essential to recognize the inherent limits of this dissertation, despite the rigorous approach adopted, since these constraints may impact the generalizability and interpretation of the results. Survey flyer distribution proved to be an obstacle in Macon County, Alabama. Although survey distribution sites had been pre-established in the community, and a substantial number of valuable responses were obtained, the snowball effect anticipated was not as effective as anticipated. The technique can be helpful to increase response rate when the demographic of interest is hard to reach, such as those in rural communities (Berndt, 2020). During the survey distribution for this research, initial volunteers were invited and encouraged to share the survey flyer with more eligible people. Frequent bad weather during survey distribution at food distribution sites in Macon County caused low turnout, which also reduced the number of anticipated responses. Another limitation included participants with little to no digital literacy skills. For example, some individuals received flyers but could not access cellphones with QR-compatible capabilities or the internet to take the online survey. Finally, with Macon County being ground zero for the infamous Tuskegee Syphilis Study, there is still apprehension among community members about participating in any study of any kind (Freimuth et al., 2001). The

combination of these limitations has made it challenging to conduct research in this region in the past.

Definitions of Terms

In this section, the most used key terms in this research have been listed and defined.

Videoconferencing

Videoconferencing is an information and communication technology with great potential for uniting people dispersed across locations. It allows participants to communicate with each other through audio and video in real-time and work together on tasks (Gibson & O'Donnell, 2009). Wiesemes and Wang (2010) defined videoconferencing as a synchronous channel of communication that supports the transformation of interactive voice, video, and data between two or more groups of people. Videoconferencing is an advanced technology that can connect individuals who are physically separated in different areas. This technology is especially beneficial in rural and underserved areas, as it may provide essential access to education, healthcare, and economic prospects. Consequently, it helps to diminish the gap in digital access and promotes the development of communities (Hafermalz & Riemer, 2020; Parker et al., 2020).

Digital Divide

The digital divide originally referred to the disparity in access to emerging technologies across certain demographic groups (van Dijk, 2006). The notion of the digital gap was broadened in more recent studies conducted by Ragnedda & Muschert (2013), Warschauer & Matuchniak (2010), and Aissaoui (2022). van Deursen and van Dijk (2019) broadened the definition of the digital divide to distinguish between different devices (such as mobiles, tablets, and laptops) and methods of accessing the Internet (mobile vs. broadband). They found that devices and access contribute to the deepening existing disparities regarding internet abilities, use, and outcomes.

This enhanced comprehension emphasizes that providing access to technology does not resolve deeper problems of digital inequality. Proficiency in utilizing technology, accessibility, and the capacity to use the Internet for significant results are essential components of the digital divide (van Deursen & van Dijk, 2019). Their approach highlights that socioeconomic, educational, and regional circumstances substantially influence people's capacity to benefit from digital technology. Individuals living in low-income or rural regions may have compounding disadvantages due to restricted access to high-speed internet and lower levels of digital literacy (Haight et al., 2014). To tackle the digital divide, it is necessary to implement comprehensive strategies that enhance digital skills training, guarantee access to high-quality Internet, and create conducive environments where technology can be effectively utilized for educational, professional, and social purposes (Robinson et al., 2020).

Socioeconomic Status

Socioeconomic status (SES) defines an individual's economic and social standing and is often linked to improved overall lifestyle and health outcomes (Baker, 2014). Boardman and Robert (2000) defined SES as a combination of an individual's economic standing (including education, income, wealth, and work status) and the impact of their area (such as poverty rate, unemployment rate, and the proportion of families getting public assistance). Adler et al. (2016) conducted a study that delved further into the influence of SES on other aspects of life, such as mental health, educational achievement, and availability of resources. Individuals with a higher SES often have improved access to healthcare, adopt healthier lives, and have more possibilities for physical exercise and healthy meals. As a result, they have better overall health outcomes, a better quality of life, and increased lifespans (Braveman et al., 2011).

In contrast, those with lower SES often experience elevated levels of stress, substandard living circumstances, and restricted availability to high-quality healthcare, which in turn contribute to negative health outcomes and decreased lifespans (Stringhini et al., 2017). In addition, SES discrepancies have an impact on educational chances. Individuals from higher SES backgrounds tend to attend schools with more financial resources and have more access to educational resources. This further contributes to the perpetuation of the cycle of inequality (Sirin, 2005). Comprehending SES is essential for policymakers and healthcare practitioners in order to create specific interventions that may decrease inequities in health and education and foster fairness and equality (Marmot, 2015).

Poverty and Low Income

According to Wahlbeck et al. (2017), to fully comprehend the impact of poverty on people, it is necessary to see poverty as a single factor and examine it in relation to several socioeconomic variables. Put simply, poverty is not just defined by a lack of cash, but rather by the convergence of other socioeconomic factors (such as unemployment, reliance on assistance, and limited education) within a certain social and cultural environment. This comprehensive strategy recognizes that poverty affects several areas of life, such as health, education, and social use, leading to a cycle of disadvantages that is difficult to overcome (Bradshaw, 2016). Low educational attainment often results in a scarcity of work prospects and a decrease in income, which worsens health issues by restricting access to healthcare and nutritional food (Lund et al., 2010). The social context, including communal assets and social connections, also has a crucial impact on either alleviating or intensifying the consequences of poverty. Communities characterized by elevated poverty rates often have insufficient infrastructure, restricted availability of quality education, and elevated crime rates, which exacerbate the cycle of

deprivation for people (Galster, 2012). To effectively tackle poverty, it is necessary to implement comprehensive policies that specifically address these interrelated problems and foster socioeconomic stability by focusing on education, career prospects, and community advancement (Blacksher et al., 2021).

Rural

The phrase "rural" evokes commonly held notions of agricultural land, ranches, tiny settlements, villages, and expansive areas devoid of urban development. Cromartie and Bucholtz (2008) provided a definition of rural that is based on administrative, land use, or economic criteria. This definition encompasses a wide range of socioeconomic features and well-being among the population being studied, resulting in significant heterogeneity. Rural, as per the definition provided by the United States Census Bureau (2021), encompasses expansive rural areas and communities with a population of less than 2,500 individuals. Rural is also defined as the opposite of urban. In other words, after identifying specific urban districts, rural refers to what landscape and space remains in the geography . Alternative definitions of rural may be used by other government departments and scholars, though. For example, the U.S. Department of Agriculture's Economic Research Service noted that rural communities can be measured using various criteria such as population density, spatial distribution, population size, economic activities, access to services, infrastructure, social characteristics, geographic isolation, and policy definitions (Ratcliffe et al., 2016). This comprehensive approach to defining rurality recognizes the varied and intricate nature of rural regions. Rural areas often encounter distinctive obstacles, such as restricted healthcare accessibility, limited educational prospects, and scarce economic resources, all of which may profoundly affect the standard of living (Hart et al., 2021).

Blackbelt Region

A region in the American South with rich, black soil that was a center of slavery and has a large Black population today (Stewart & DeRonck, 2020). The term's meaning expanded in the 19th century when the region was developed for cotton plantations that used enslaved African Americans as workers and had soil with the characteristic black color (Sisk, 1953).

Summary

The COVID-19 pandemic has significantly impacted videoconferencing use, particularly in low socioeconomic rural (LSR) communities like Alabama's Blackbelt Region. Despite the widespread adoption of videoconferencing platforms, many adults struggle to access and use them due to the digital divide. The Blackbelt region, one of the poorest in the United States, has faced challenges such as rural isolation, limited healthcare options, and lack of educational opportunities. The digital divide, which includes skill, motivation, and cultural norms of use, has been a central issue in new media development since the 1990s. Access to technology in LSR communities is confounded with broader resources, limitations, and ongoing poverty and social inequality struggles. As videoconferencing becomes more common, it is crucial for technology acceptance studies to tackle the digital divide gap in LSR communities aggressively.

Understanding the full scope of use of various technologies among different demographics can help tailor technology to meet the needs of underserved populations and potentially aid in reducing the digital divide. This study examined the use of videoconferencing in low socioeconomic rural regions (LSR) in Alabama using Andragogy, Technology Acceptance Model 2 (TAM2), and computer self-efficacy (CSE) frameworks. Andragogy emphasizes self-directed learning and practical relevance for adults, while computer self-efficacy refers to the adult individuals' confidence in their ability to use technology effectively.

This dissertation is divided into five different chapters. Chapter I contains an introduction to the study, statement and purpose of the problem, theoretical frameworks, significance of the study, research questions, and the limitations of the study. Chapter II reviews related literature addressing the research questions. Chapter III describes the methodology and data analyses procedures of the study. Construction of the survey instruments, sample selections, administration of the instruments, and methods of data interpretation are also discussed in Chapter III. Chapter IV contains survey results and analyses. Finally, Chapter V offers discussion of results, implications for theory and practice, as well as recommendations for further research.

CHAPTER II: REVIEW OF LITERATURE

Studies have shown a lack of use of technology among low socioeconomic rural (LSR) communities (Galperin & Fernanda Viecens, 2017; Rice & Haythornthwaite, 2010; Warren, 2007; Whitacre, 2017). However, during the COVID-19 pandemic, these communities had to use videoconferencing for everyday life (banking, education, socializing, and healthcare) (Aissaoui, 2022). Videoconferencing became the new normal when access to the internet in many rural areas was nonexistent or severely limited, which has been problematic for years (Perrin, 2019). Due to internet access, this problem becomes more complex and compounded when people in low socioeconomic areas reside in rural communities.

The COVID-19 pandemic affected in-person relationships because of variables, including government-enforced lockdowns, social distancing measures, and a transition to remote employment and online learning. To mitigate the transmission of the virus, governments throughout the globe implemented lockdowns and issued stay-at-home directives (Frank & Grady, 2020). These policies limited individuals' mobility, shuttered non-essential establishments, and banned meetings, significantly diminishing in-person connections. Social distancing rules advise individuals to keep a minimum physical distance of six feet from others. Reducing in-person interactions impacted social contexts, such as businesses, educational institutions, and public areas. Despite the challenges, people adapted by utilizing technology to stay connected. Videoconferencing became essential for maintaining personal and professional relationships. With the closure of offices and the transition to remote work, videoconferencing became crucial for sustaining corporate activities, fostering teamwork, and conducting client meetings (Waizenegger et al., 2020). Educational institutions used online learning systems and utilized videoconferencing capabilities to facilitate the delivery of lessons, examinations, and

seminars. Organizations adjusted by organizing virtual conferences, webinars, and other events to sustain operations without in-person meetings. Videoconferencing facilitated engaged and captivating learning experiences, assisting instructors in preserving a semblance of classroom use (Dhawan, 2020).

Individuals used videoconferencing to maintain connections with their loved ones, mitigating the feelings of isolation resulting from social distancing measures—virtual platforms-maintained customs and interpersonal connections by hosting social gatherings, such as festivities and religious services. However, disparities in access to technology, socioeconomic status, and geographical location highlighted significant inequalities, particularly affecting lower-income and rural communities, increasing the digital divide (Dhawan, 2020). Therefore, this study aimed to understand the videoconferencing use of LSR communities. This chapter will address the methodology used to conduct the literature review, theoretical framework and models, themes that emerged from the literature, and the gaps in research this study intended to fill.

Methodology of Literature Review

In this study a methodical strategy to conduct the literature review was used, focusing on English language papers published between 2010 and 2024. However, I made allowances to include relevant results crucial to my study. I used electronic indexes (Elton Bryson Stephens Company [EBSCO], Science Direct, and ProQuest) to identify the publications referenced in this dissertation. The indexes allowed access to interdisciplinary databases, such as Science Direct, Google Scholar, and JSTOR, and content-specific databases, including Inform, Educational Resource Information Center (ERIC), Educational Research Complete, and ScienceDirect. Due to the limited number of studies on using videoconference technology in the Alabama Blackbelt

Region, the database indexes served as a tool to refine searches and locate publications aligned with the research requirements. The keywords used for the search were "videoconference technology," "digital divide," "technology acceptance model," "computer self-efficacy," "low socioeconomic status," and "rural communities in the Blackbelt region." The categorization approach included considering videoconference technology, technology acceptance model, and digital divide research to identify which papers were relevant and which were irrelevant. I also tried to exclude research focusing primarily on videoconference systems. During the search process, I assessed the information to guarantee its relevance to the research. After applying the criteria for inclusion and exclusion, 441 online research journals were reviewed, but 184 publications satisfied the standards and were cited.

Theoretical Frameworks and Models

This section discusses theoretical frameworks and models, including Andragogy (an adult learning theory), the Technology Acceptance Model (TAM), and Computer Self-Efficacy (CSE).

Adult Learning Theories

Adult learning theories provide frameworks for understanding how adults acquire knowledge, skills, and attitudes. These theories include experiential, transformational, self-determination, andragogy, and social learning. Fundamental principles include the need for adults to plan and evaluate their learning, their relevance to real-life situations, and the importance of drawing on learners' experiences. Experiential learning theory, as proposed by David Kolb, suggests that learning unfolds through a cyclical process that includes concrete experience, reflective observation, abstract conceptualization, and active experimentation stemming from the direct use of the subject matter (Kolb, 1984). This theory emphasizes the

importance of personal involvement and reflective observation as crucial elements of the learning process (Kolb & Kolb, 2022; Morris, 2020).

Learning occurs through the interaction between several types of theoretical stages (experiential, transformational, self-determination, andragogy, and social learning), with individuals often preferring certain stages over others. Transformational learning involves a profound shift in an individual's perspective, beliefs, or values, often due to a disorienting dilemma or critical reflection (Mezirow, 2003; Slavich & Zimbardo, 2012). Identified stages in the transformational learning process include becoming aware of one's assumptions, critically examining those assumptions, and ultimately making transformative changes (Mezirow, 2003). Self-determination theory centers on intrinsic motivation's significance in learning, highlighting crucial factors of autonomy, competence, and a sense of relatedness (Koole et al., 2019). As per this theory, individuals are inclined to participate in and sustain learning endeavors when they experience a sense of autonomy and competence, finding their learning meaningful and aligned with their goals. Andragogy emphasizes self-directed learning and recognizes that adults have different motivations and learning styles than children (Knowles, 1980). Social learning theory underscores the significance of observation and modeling as influential elements in the learning process (Li et al., 2023). Individuals acquire knowledge by observing others and emulating their actions, with reinforcement and punishment also contributing to behavior formation (Horsburgh & Ippolito, 2018).

Andragogy

Malcolm Knowles (1980), a prominent figure in the field of adult education, expressed his perspectives on adult learners through his theory of andragogy. Andragogy, a term he originated, pertains to the techniques and fundamental concepts employed in the education of

adults. According to Loeng (2020), Knowles argued that adults possess a self-concept that revolves around assuming responsibility for their own lives. They perceive themselves as competent in making choices and assuming accountability for the outcomes of those choices. He stressed that adults gather a plethora of experiences that act as valuable resources for learning. These experiences mold their viewpoints, dispositions, and comprehension of the world, impacting their approach to new learning opportunities (Knowles, 1980).

According to Knowles et al. (1980, 2015), adults are primarily interested in learning subjects that are immediately relevant and applicable to their lives. Individuals are generally inclined to acquire knowledge or skills when they recognize a clear advantage or necessity associated with the learning process. Adult learners generally exhibit a problem-centered approach and prioritize the practical application of their acquired knowledge to address real-life issues or enhance their situation. They have a preference for learning activities that are pragmatic, experiential, and directly applicable to their personal or professional circumstances. Knowles contended that adults possess intrinsic motivation to acquire knowledge, propelled by factors such as self-development, professional progression, or improving their standard of living (Purwati et al., 2022). Adults are more inclined to participate in the process of acquiring knowledge when they view it as beneficial to their personal interests and objectives. Knowles advocated for the promotion of learner autonomy, which pertains to the capacity of learners to assume control over their own learning process and exhibit self-direction in adult education (Purwati et al., 2022). He advocated for adult autonomy in the learning process, which entails the ability to establish goals, define learning objectives, and choose suitable methods and resources. The recognition of adult learners' influence in shaping their own learning process instills a sense of worth and importance within the educational system.

Cyril Houle (1961) expanded upon this area of study by highlighting the significance of continuous learning and classifying adult learners into goal-oriented, activity-oriented, and learning-oriented categories. This classification aided in comprehending the various motivations behind adult education and learning (Brockett & Donaghy, 2005). Allen Tough's (1971) study on self-directed learning projects demonstrated how adults actively participate in learning activities motivated by individual needs and objectives, emphasizing the practical utilization of knowledge. Edward Lindeman (1926), a trailblazer in the field of adult education, emphasized the importance of experiential learning and the seamless integration of education into everyday life. Lindeman stressed the importance of adult education being grounded in learners' personal experiences and aiming to foster societal transformation and active involvement in democratic processes (Brockett & Donaghy, 2005). The focus on practical application in adult learning makes it engaging and interesting, as it directly affects their daily lives and society.

Adult Learner Characteristics. Adult learners exhibit distinct characteristics that differentiate them from younger learners. They are typically self-directed, taking responsibility for their learning process and setting goals based on personal or professional aspirations (Kauffman, 2015). Drawing from rich life experiences, they seek relevance in their learning, preferring practical applications and solutions. Motivated by intrinsic and extrinsic factors, they are goal-oriented and persistent in pursuing knowledge and skill development (Houle, 1961). Adult learners demonstrate diverse learning styles and preferences, influenced by their cultural background and individual traits. Embracing technology, they integrate digital resources into their learning journey, enhancing their access to information and opportunities (Loeng, 2020). Engaged in lifelong learning, they actively participate in professional development and continuing education, recognizing the importance of staying current in their fields.

Understanding and catering to these characteristics are essential for educators and institutions to create effective learning environments tailored to the unique needs and motivations of adult learners.

The use of technology and videoconferencing is greatly impacted by the qualities of adult learners, such as their self-directedness, motivation, and desire for practical application. Adult learners possess a wealth of life and professional experiences that they want to incorporate into their learning settings and daily lives. Videoconferencing technology facilitates immediate conversations and cooperative learning, allowing adult learners to integrate new material with their own knowledge and experiences (Ruey, 2010). Adult learners are often autonomous and strongly driven, often motivated by specific objectives such as personal development or professional progression. This incentive increases their propensity to interact with technology that caters to their educational requirements. Research indicates that adult learners highly appreciate the flexibility and autonomy to regulate their learning speed, which may be facilitated using technology and videoconferencing (Huang, 2002; McDonough, 2016; Merriam & Caffarella, 1991).

Technology Acceptance Model

The Technology Acceptance Model (TAM) was adapted from the Theory of Reasoned Action (Ajzen & Fishbein, 1980) and initially proposed by Davis (1986). According to the TAM, the causal sequence of thinking activates two types of beliefs. These beliefs include those that a person has about whether other people would approve or disapprove of their performing (or not performing) a specific behavior, together with the motivation to comply with what the person thinks others would want them to do (Sarver, 1983). This theory may also explain behavioral intention as measured by attitude and subjective norms concerning the actual behavior.

According to the Theory of Reasoned Action (Davis, 1986), behavioral intention is shaped by the individual's attitude toward the behavior (determined by beliefs about consequences and their evaluations) and subjective norms (influenced by normative beliefs and motivation to comply). These factors predict the individual's readiness or willingness to engage in the behavior.

While referring to the logic of the theory, Davis (1986) stated that TAM explores the factors influencing the intention to use information or communication technology. He noted that technology shows a causal relationship between key variables, including ease of use, attitudes to use, behavioral intention, adoption of existing systems, and usage (Park, 2007, 2009). TAM assumes that two major variables determine an individual's acceptance of information systems: perceived usefulness and ease of use. Research has shown that the two constructs are related (Davis, 1989) in that those who perceive technology as useful are also likely to perceive it as easy to use. This is important because the perception that technology is valuable and easy to use is essential for driving adoption, reducing resistance, fostering satisfaction and continued use, encouraging positive word-of-mouth, and facilitating faster learning and proficiency. These factors collectively contribute to the successful integration and utilization of technology in various contexts. To better understand the mechanisms behind technology adoption, the Technology Acceptance Model 2 (TAM2) offers an enhanced framework that builds upon the original TAM, providing deeper insights into user acceptance and usage patterns.

Technology Acceptance Model 2

The Technology Acceptance Model 2 (TAM2) is an addendum of the earliest TAM proposed by Fred Davis in the late 1980s (Venkatesh & Davis, 2000). TAM2 was introduced by Venkatesh and Davis (2000) to address some limitations of the original model and to incorporate additional factors influencing technology acceptance and use. TAM2 retains the core elements of

the original TAM, which focuses on two primary determinants of user acceptance of technology: perceived usefulness and perceived ease of use (Venkatesh & Davis, 2000). However, TAM2 expanded upon the original model by including additional constructs to better explain the technology acceptance and use process. Some of the key additions in TAM2 include external and endogenous variables and acknowledges that external factors beyond ease of use can influence the perceived usefulness of users' attitudes and intentions toward using technology. These external variables include subjective norm, image, voluntariness, experience, and facilitating conditions. Subjective norm describes the perceived social pressure or influence from others regarding the use of technology. Image reflects the user's perception of the social image associated with using the technology. Voluntariness refers to whether the use of the technology is voluntary or mandatory. Experience encompasses the user's previous experience with similar technologies. Facilitating conditions refer to the perceived support and resources available to the user for using the technology.

By incorporating these endogenous variables, TAM2 provides a more comprehensive understanding of how external factors influence users' attitudes and intentions toward technology adoption. Overall, TAM2 extended the original TAM by incorporating additional factors and variables to explain the technology acceptance better and the use process. It provides a more comprehensive framework for researchers and practitioners to understand and predict user acceptance of technology in various contexts (Wang et al., 2022). This knowledge is connected to the idea of self-efficacy, which has a substantial impact on an individual's confidence and proficiency in efficiently using technology.

Self-Efficacy

In 1977, Bandura proposed a concept referred to as *self-efficacy*. The term refers to a person's belief that they can execute behaviors required in a particular situation. Perceptions of one's own efficacy and expectations that one will succeed at performing given tasks are essential factors in directing the individual's behavior. Bandura (1986) also defined self-efficacy as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. He argued that self-efficacy is a critical element of human agency because it effectively sets parameters on the types of behavior in which individuals are likely and willing to engage.

However, Bandura's (1986) restrictive words, "given situational demands," have given self-efficacy a narrow focus. While this concept does acknowledge the influence of situational factors on self-efficacy, it can also lead to a narrow focus on self-efficacy. By emphasizing the importance of situational demands, Bandura's framework may overlook other factors contributing to self-efficacy, such as personal characteristics, past experiences, and social influences. This narrow focus on situational demands might underestimate the complexity of self-efficacy and overlook the broader context in which individuals develop and maintain their beliefs about their capabilities. Additionally, an exclusive focus on situational demands may limit the applicability of Bandura's theory to diverse contexts and populations. Self-efficacy is influenced by a wide range of factors beyond situational demands, and by narrowing the focus of this aspect, important nuances in understanding how self-efficacy operates in various settings may be missed; thus, limiting the research findings.

Most researchers have limited their research to the magnitude and strength dimensions, conceptualizing and studying self-efficacy as a task-specific or state-like construct (Lee &

Bobko, 1994). Subsequent research and studies (Bouih et al., 2021; Eden, 1988; Judge & Bono, 1998; Schwarzer & Jerusalem, 1995; Sherer et al.,1982) examining self-efficacy have helped to birth the new general self-efficacy concept. General self-efficacy refers to an individual's conviction in their ability to perform well in a broad range of settings requiring different skills and achievements (Eden, 1988) or as how people see their own capacity to perform well in various scenarios (Judge & Bono, 1998). General self-efficacy describes differences among individuals in their likelihood of seeing themselves as able to meet task demands in numerous circumstances.

Eden (1988) suggested that self-efficacy is a motivational state and general self-efficacy is a motivational trait. Self-efficacy as a motivational state refers to the belief in one's ability to successfully execute a specific task or behavior in a particular situation at a given time. In other words, it is an individual's confidence or belief in their ability to accomplish a specific goal or task in a specific situation. This level of self-efficacy can fluctuate depending on various factors such as the task difficulty, past experiences, feedback received, and the perceived level of support available. On the other hand, general self-efficacy is a broader, more stable belief in one's overall competence to handle various situations and challenges across different domains of life. It is a more generalized belief in one's ability to deal with life's challenges and adversities. This level of self-efficacy tends to be more enduring and less susceptible to short-term fluctuations than situational self-efficacy. While situational self-efficacy pertains to confidence in performing specific tasks in specific situations at a given time, general self-efficacy reflects a more stable and generalized belief in one's overall competence across various situations (Eden, 1988). This distinction is important because it helps us understand how self-efficacy operates at different levels and how it can impact motivation and behavior in various contexts.

Computer Self-Efficacy

Compeau and Higgins (1995) introduced another category of self-efficacy, called computer self-efficacy (CSE), which refers to a judgment of one's capability to use a computer. It is not concerned with what one has done in the past but rather with judgments of what could be done in the future. CSE does not refer to simple component subskills, like formatting or entering formulas in a spreadsheet. Rather, it incorporates judgments of the ability to apply those skills to broader tasks. The theoretical framework of computer self-efficacy was essential to this study as it could impact other variables associated with adults' use and acceptance of videoconference technologies.

Computer self-efficacy (CSE) can have several impacts regarding videoconference use. Adults with high CSE will likely feel more confident using videoconference tools (Marakas et al., 2022). They may be more willing to explore features, troubleshoot issues, and adapt to changes in the software. Higher CSE may lead to greater adoption and utilization of videoconference platforms. People who believe in their ability to use technology effectively are more likely to embrace videoconferencing as a means of communication and collaboration. Those with higher CSE may be more inclined to engage in learning and mastering videoconference tools. They may seek tutorials, online resources, or training opportunities to enhance their skills and proficiency (Alqurashi, 2016). Adults with greater computer self-efficacy may be more productive and efficient in using videoconference tools. They may navigate interfaces more swiftly, troubleshoot technical issues independently, and communicate effectively during meetings or presentations.

Conversely, individuals with low computer self-efficacy (CSE) may resist using videoconference tools (Alharbi & Drew, 2019). They may feel overwhelmed or anxious about

learning new technology, leading to reluctance to adopt videoconferencing as a communication medium. CSE can influence the quality of collaboration and communication during videoconference use (Marakas et al., 2022). Those with higher self-efficacy may engage more actively, contribute ideas confidently, and utilize various platform features to enhance interaction. CSE may shape individuals' perceptions of the ease of use of videoconference tools. Higher self-efficacy may lead to a perception of greater ease of use, while lower self-efficacy could result in perceptions of complexity and difficulty (Alharbi & Drew, 2019). CSE plays a significant role in shaping individuals' attitudes, behaviors, and experiences with videoconference use, ultimately impacting their effectiveness and satisfaction with the technology.

Schunk (2012) found that compared with individuals who doubt their capabilities, those with high self-efficacy participate more readily, work harder, persist longer, show greater interest in learning, and achieve at high levels. He goes on to state that adults with low self-efficacy may believe that things are more difficult than they really are – a belief that can foster anxiety and stress. Anxiety caused by using computers can have a detrimental effect on self-efficacy by undermining confidence, promoting avoidance behaviors, impairing learning, and reinforcing negative self-perceptions (Schunk, 2012). Addressing computer-related anxiety through supportive environments, targeted interventions, and opportunities for skill-building can help individuals build stronger confidence and belief in their capacity to excel in tasks involving computers.

Nelson and Ketelhut (2008) found that learners with low levels of initial self-efficacy in science viewed fewer guidance messages than their higher-efficacy peers and did not perform as well as their higher-efficacy peers regardless of guidance use level. Theoretically, this lack of

self-efficacy could also lead to the lack of initiative to seek opportunities to pursue higher levels of education. Less experience may also affect CSE and lead to lower performance (Fagan et al, 2003). Chisholm et al.'s (2002) research examined an indirect effect of age on CSE and subsequent computer performance. These researchers hypothesized that individual characteristics such as age, sex, and ethnicity affected income and computer ownership, which affected CSE. They found that age only slightly impacted computer ownership.

The Technology Adoption Model 2 (TAM2) expanded upon TAM by including social impact and cognitive instrumental processes to highlight the factors that contribute to user adoption of technology (Venkatesh & Davis, 2000). Understanding videoconference usage in low socioeconomic rural regions requires studying TAM2, since it emphasizes important characteristics such as perceived utility, simplicity of use, and social impact. These factors are essential for boosting technology adoption (Venkatesh & Bala, 2008).

CSE and Education. Studies have shown a significant correlation between the degree of education and computer self-efficacy (CSE), which refers to an individual's confidence in their ability to utilize computers proficiently (Jones, 2016). According to Smith and Brown (2018), people with higher levels of education tend to have higher CSE. This is because educated individuals usually have more exposure to technology and have had formal training in computer abilities. This association highlights the significance of educational possibilities in influencing people's self-assurance and proficiency in utilizing digital technologies. Research has shown that people with a college degree have greater levels of computer self-efficacy compared to those with lesser levels of education (Jackson et al., 2020). In the present era of digital technology, having strong technical skills is becoming increasingly crucial for achieving success in both academic and professional domains (Smith & Brown, 2018). Educational institutions have a vital

role in promoting computer self-efficacy by including digital literacy into their curriculum and offering training that prepares students with the essential technology abilities (Jackson et al., 2020).

CSE and Age. Age has been shown to be significant factor in influencing computer self-efficacy (CSE), which refers to their confidence in their ability to utilize computers proficiently (Chen & Chan, 2014). Multiple studies consistently demonstrate that younger persons possess greater levels of CSE compared to older adults (Jackson et al., 2017; Czaja et al., 2006). The difference in technology use across generations is explained by variations in exposure, with younger generations being more involved in digital technology from an early age (Livingstone & Helsper, 2007). In addition, elderly individuals may encounter difficulties due to the natural loss in cognitive functioning and physical agility that comes with age. These obstacles might affect their level of confidence when it comes to using intricate digital technologies (Czaja et al., 2006; Mitzner et al., 2008). Nevertheless, the implementation of customized training programs and design methods that are easy for users to navigate have improved the level of confidence older people have in using computers (Charness et al., 2011; Mitzner et al., 2008).

CSE and Income. Studies suggest that individuals in higher income brackets tend to have better access to technology and resources, which in turn leads to higher levels of computer self-efficacy (Charness et al., 2011; DiMaggio & Hargittai, 2001). Individuals with higher earnings have the financial means to purchase more sophisticated technology and are more likely to have been exposed to digital gadgets from an early age. Conversely, individuals with lower incomes might encounter obstacles such as restricted availability of computers and internet connection, which might affect their level of confidence in utilizing digital technologies (Livingstone & Helsper, 2007). Nevertheless, efforts such as community technology centers and

subsidized internet programs strive to narrow this digital gap by offering access and education to marginalized communities (Charness et al., 2011; DiMaggio & Hargittai, 2001).

CSE and TAM2. The research findings emphasized the substantial influence of the Technology Acceptance Model 2 (TAM2) on individuals' confidence in using computers (Venkatesh & Davis, 2000). It clarifies how the distinct factors of the model affect users' attitudes and actions when it comes to adopting and using technology. Research repeatedly shows that the perception of how easy it is to use a computer (PEOU) and the perception of how helpful it is (PU) are positively related to higher levels of computer self-efficacy as they increase users' confidence and skill in using digital technologies (Venkatesh & Davis, 2000). The attitude towards use (ATT) is a significant factor that influences users' views and intentions towards technology, affecting their self-efficacy (Venkatesh & Davis, 2000). Furthermore, the inclusion of subjective norms (SN) and behavioral intentions (BI) enhances users' confidence in technology use by considering social influences and predicting behaviors (Venkatesh & Davis, 2000). The research highlighted that TAM2 offers a strong framework for anticipating and comprehending users' attitudes and behaviors towards technology, which in turn influences their computer self-efficacy (Venkatesh & Davis, 2000).

Literature Review Themes

Based on the literature review process, themes emerged related to the pervasive impact of the digital divide, limited access to technology, socioeconomic disparities, and the unique challenges faced by rural communities, minorities, and those residing in the Blackbelt region. These themes guided the exploration into how unequal access to digital resources shapes opportunities in the use of videoconferencing and related technologies, highlighting the profound

implications for marginalized groups across low socio-economic strata and rural geographic locations.

Digital Divide

The digital divide is a term originally used to describe the gap in access to recent technology that exists between different groups of people (van Dijk, 2006). van Deursen and van Dijk's (2019) definition included indications that differentiated access to various devices (such as mobiles, tablets, and laptops) and modes of Internet access (mobile vs. broadband) also widen existing inequalities related to internet skills use and outcomes.

Minorities in the United States are greatly affected by the digital divide, which considerably influences their ability to access technology, use the internet, and develop digital literacy skills, according to the Pew Research Center (2019). Pew has performed comprehensive investigations to elucidate these inequalities and found that understandings of technology-related issues varied greatly. Minority groups, namely African Americans and Hispanics, often have limited availability of high-speed internet and digital gadgets in comparison to their white counterparts. They found that broadband internet was available in just 66% of African American families and 61% of Hispanic households, compared to 79% of white households. This inequality hinders the capacity of minority groups to actively participate in online education, telehealth services, and distant labor.

According to the Pew Research Center (2019), over 25% of African Americans and 23% of Hispanics rely only on their smartphones for internet access since they lack standard broadband connections at home. The reliance on this connection might provide challenges because of the constraints imposed by limited data availability and the lower display dimensions of mobile devices, which can impede efficiency and impair the ability to access resources. This

digital gap has substantial consequences for the education of minority groups. Amidst the COVID-19 epidemic, the transition to remote learning exacerbated these inequalities with 34% of African American and 39% of Hispanic students having to use cell phones to do their coursework. Additionally, 25% of both groups could not finish their homework because they could not access a computer. These difficulties exacerbate educational disparities and impede academic advancement for certain groups.

Limited Technology

Economic constraints play a crucial role in contributing to the digital divide. According to Pew Research Center (2019), 44% of families earning less than $30,000 per year lack internet connectivity, which has a greater impact on minority populations. The main barriers keeping these areas from reaching digital equality are the high internet access prices and digital devices. Insufficient availability of essential equipment, such as laptops, cameras, and headsets may have impeded the ability to actively use in videoconferencing especially for lower-income persons (van Deursen & van Dijk, 2019). Students from economically disadvantaged backgrounds often lacked the essential technology required for remote learning, worsening educational disparities. Videoconferencing had frequent interruptions, latency, and poor video quality due to slow or unpredictable internet connections, which negatively impacted communication efficiency and effectiveness (Reisdorf et al., 2020). Locating secluded and tranquil areas for videoconferencing proved to be difficult for many people, resulting in numerous disturbances and interruptions that had a negative impact on productivity and involvement (Shockley et al., 2021). Professionals and students need assistance sustaining active use in meetings and classrooms due to slow internet connectivity, resulting in lost information and reduced productivity.

The COVID-19 epidemic has heightened the need for videoconferencing to communicate across different industries, intensifying the existing gap in digital access. The heightened dependence on videoconferencing has brought attention to the unequal access to essential technologies, including high-speed internet, PCs, and cellphones. People and communities without access to these resources had substantial difficulties engaging in distant labor, education, and social activities (van Deursen & van Dijk, 2019). The digital gap has a greater impact on lower-income families. Individuals in this group had a lower probability of possessing the financial resources required to get high-speed internet or numerous devices essential for simultaneous usage by various family members for work and education (Hargittai & Redmiles, 2020). Rural regions may need additional infrastructure to provide high-speed internet, which poses challenges for inhabitants in videoconferencing.

Low Socioeconomic Status and Digital Divide

According to the Federal Communications Commission (FCC) (2020), only 51.6% of rural U.S. residents had 250/25 megabits per second (Mbps) internet access in 2018 compared to 94% of urban residents, broadband that would support a household with four devices under the FCC's definition of moderate usage. The National Broadband Plan specifically addresses the need for speed by stipulating that 100 million households or more should have download speeds of at least 100 Mbps and upload speeds of at least 50 Mbps (Mack, 2014). As noted above, more recent research on the digital divide by van Deursen and van Dijk (2019) indicated that differential access to various devices (such as mobiles, tablets, and laptops) and modes of Internet access (mobile vs. broadband) also widen existing inequalities related to Internet skills, use, and outcomes.

Broadband refers to high-speed Internet access that is faster than traditional dial-up access and includes technologies like DSL (Digital Subscriber Line), Cable Modem, Fiber, Wireless, Satellite, and Broadband over Powerlines (BPL) (Lobo et al., 2020). The choice of broadband technology depends on factors like location, price, and availability. DSL is a wireline transmission technology that transmits data faster than traditional copper telephone lines, offering speeds ranging from 100 Kbps to millions of bits per second (Mbps). Cable modems provide broadband using coaxial cables, with 1.5 Mbps or more speeds. Satellite broadband is another wireless broadband suitable for remote or sparsely populated areas. BPL delivers broadband over existing low- and medium-voltage electric power distribution networks, offering speeds comparable to DSL and cable modem speeds (Federal Communications Commission [FCC], 2014).

DSL, cable modem, fiber, wireless, satellite, and broadband over powerlines (BPL) are several types of broadband technologies important in bridging the digital divide (Reddick et al., 2020). DSL and cable modems are readily accessible in urban and suburban regions, providing fast internet connectivity. Fiber optic cables provide superior data transmission speeds but are less often used owing to their elevated installation expenses. The accessibility of these technologies is limited in rural and low-income regions, intensifying the digital divide. Urban regions get advantages from their greater population density, which reduces the cost per user. This cost reduction makes it more viable to implement these technologies in urban areas. Wireless and satellite technologies provide viable options for isolated and rural locations where conventional cable connections are not feasible. Wireless broadband, such as 4G LTE and upcoming 5G, offers extensive coverage but often requires more reliability and faster speeds than traditional connections. Satellite internet has extensive coverage but is hindered by significant

latency and bandwidth restrictions, making it less suitable for applications that need immediate use, such as videoconference system Broadband over powerlines (BPL) leverages the preexisting electrical infrastructure to provide internet services. This technique can reach locations that lack sufficient infrastructure without the need for significant new construction. Nevertheless, the use of this technology has been restricted because of technical obstacles and disruptions to other communication services.

The characteristics of the mobile internet can be understood from three perspectives: user, environment, and system (Chae et al., 2002). A mobile internet system is portable and always available. First, from the user's perspective, mobile Internet devices are usually more personal and individual than stationary internet devices (Kristoffersen & Ljungberg, 1999). Therefore, the mobile device always carries its user identity. It is common for people to share their desktop computers, whereas it is infrequent for them to share mobile Internet phones. Second, from the environmental perspective, mobile internet systems usually provide instant Internet connection, enabling users to access the Internet anywhere and anytime (Lamming et al., 2000). By contrast, stationary internet systems are not usually movable and require long pre-processes, such as booting up, which typically take more than a few minutes. Lastly, from the system's perspective, most mobile internet systems, especially cellular phones, have fewer resources than the stationary internet (Chae et al., 2003). While mobile internet devices are very portable and handy, they have smaller screens, less convenient input/output facilities, and lower multimedia processing capabilities than desktop computers.

Mobile devices are often more cost-effective and easily accessible than desktop PCs, increasing internet accessibility (Friemel, 2016). Thus, the mobile internet is a crucial factor in the digital divide, acting to achieve more digital inclusion while contributing to the existing

disparities. Mobile internet may enhance digital connectivity, especially in underdeveloped or rural regions where fixed broadband is inaccessible or costly. Mobile internet is especially important for persons with lower incomes who cannot buy home broadband but may still connect to the internet via their cell phones (Pew Research Center, 2021). Although mobile internet connection offers advantages, it often has worse quality than fixed broadband. This is due to slower speeds, data limitations, and greater prices per gigabyte. Consequently, its efficacy for distance work and online education is limited (Hampton et al., 2020). Mobile devices may lack support for capabilities found on computers, such as intricate software applications necessary for specialized work tasks or educational programs. This may contribute to a state of digital exclusion, as highlighted by van Deurson and van Dijk (2014, 2019). Although mobile internet may provide more accessibility, the cost of data plans might still be a barrier for persons with low incomes, restricting their capacity to utilize it extensively (Reisdorf et al., 2020).

Due to smaller screen sizes and an increased scrolling requirement, mobile phones induce more cognitive load (Murphy et al., 2016), ultimately contributing to lower user use and content creation (Napoli & Obar, 2014). In addition, effective online participation also depended on access to a physical space to use the technology. Without a physical space to use the technology, the user risks being consigned to spectating and not participating (Vimalkumar et al., 2021). The digital divide notion has continuously evolved over the past two decades: whereas researchers once saw it as a gap between digital haves and have-nots, they now also know that it includes a skill- and use-based divide and an outcome divide (Schradie, 2011).

The digital divide among low socioeconomic adults is staggering. Data from the U.S. Department of Commerce (2020) indicated that just 57% of those with family incomes under $25,000 used the Internet at home in 2019, compared to 82% for those in the highest income

group. However, the divide began to manifest years ago with the development of radio, telephone, and television. Starting in the 1920s, the adoption of radio took place over several decades (Campbell, 2019). Black and white TV spread relatively more quickly but required almost 20 years to reach 95% of U.S. households (Sterling & Kittross, 2001). Interactive communication technology like the telephone diffused much more slowly, requiring over 80 years to reach 94% of American households (Rogers, 2001). All services needed to access computers and the internet in a home require financial payments. The lack of access to digital devices may also lead to social exclusion. Social exclusion has previously been associated with unemployment, poor job skills, low income, poor housing, and neighborhoods that lack security, and low-income family structures (Foster, 2000). In effect, socially excluded people cannot participate effectively in economic, social, political, and cultural life due to some characteristic alienation from mainstream society (Savery & Duffy, 1995). Most digitally excluded are more likely to be less educated, with more minor well-paid jobs, education, and income, and are disengaged from digital usage (Foley et al., 2003). The stigma of not having the financial resources to acquire digital, computer, and Internet access manifests in social exclusion among many poor populations.

The digital divide in videoconferencing has been researched (Lythreatis et al., 2022). These studies have focused on how this divide affects different demographics and communities. Haidar et al. (2021) study indicated that low socioeconomic communities are affected financially and how this has long term ramifications in adults such as low income and illiteracy. Communities with low socioeconomic status have substantial financial consequences because of their restricted access to digital resources, which worsens economic inequalities. The study conducted by Robinson et al. (2015) emphasizes how digital disparities limit the ability to get

employment, education, and necessary services, hence perpetuating poverty. In addition, van Deursen and van Dijk (2014) discovered that a lack of digital skills hinders economic mobility since these communities often lose out on higher-paying employment opportunities that need these abilities. Hence, the digital gap exacerbates preexisting financial difficulties, constraining social and economic progress for low socioeconomic groups. This is compounded when technology is introduced into the equation, and this demographic struggles with technology use, causing a digital divide. Unfortunately, these simultaneously overlap and amplify each other, resulting in a vicious cycle. Although some studies have focused on the digital divide among low socioeconomic communities, there is very little research (Drummonds-Whiteside, 2022; Lee et al., 2023) that examines the digital divide throughout the Blackbelt Region of Alabama.

Minorities and the Digital Divide

Minorities are disproportionately affected by the digital divide, which hinders their ability to access technology, educational opportunities, employment possibilities, healthcare, and general socio-economic mobility (Aissaoui, 2022). This division worsens pre-existing disparities and creates fresh obstacles to inclusivity and progress. Minority groups often encounter restricted availability of high-speed internet and digital gadgets, impeding their capacity to engage fully in the digital realm. Access is required to guarantee their capacity to participate in distant jobs, online education, and vital digital services. van Deursen and van Dijk (2019) argued that the digital gap has evolved beyond physical access and now encompasses differences in material access and use skills. This has had a disproportionate impact on minority groups. The digital gap worsens educational disparities among minority students, who often lack the essential tools to engage in online learning properly. According to Warschauer and Matuchniak (2010), using new technology in education may exacerbate disparities in academic achievement and prospects for

minority children by creating uneven access and use. Thus, minorities have obstacles in fully engaging in the contemporary labor market due to their limited digital literacy and lack of internet connection, which are more crucial in a digital skills-driven economy.

Robinson et al. (2015) examined the impact of digital inequalities on minorities' ability to access employment opportunities and professional growth, leading to long-lasting economic disadvantages. Minorities without sufficient internet access have difficulties obtaining online health information and telemedicine services, negatively impacting their health outcomes. Chang et al. (2021) highlighted the substantial impact of the digital divide on healthcare accessibility, especially during the COVID-19 pandemic when digital health services played a critical role. Minorities' participation in social and civic activities, such as online voting, digital activism, and access to public services, is hindered by the limited availability of internet access. Ragnedda and Muschert (2013) argued that the lack of access to digital technology might limit people's involvement in civic activities and increase their feelings of social isolation, which can disproportionately affect minority populations. Minority groups often encounter disparities in digital literacy and competencies, which restrict their capacity to use technology efficiently for educational, occupational, and everyday purposes.

Minority Populations in the Rural Blackbelt Region

Alabama's Blackbelt is part of a larger impoverished region distinguished by its population and soil (Stewart & DeRonck, 2020). As noted earlier, this region is called Blackbelt because of the predominantly African American people and the dark soil. This region is also desecrated by a history of slavery, sharecropping, denial of rights, disruption of social, economic, and political structures, and community and collective action (Myrdal, 1944). Cromartie (1999) noted that the region's problems stem from its long and difficult adjustment from the slave-based

agrarian Southern economy to today's diverse and highly competitive global economy. In the first half of the twentieth century, years of soil erosion, the boll weevil invasion, the collapse of cotton tenancy, the failure to diversify economically, the urban exodus, and the repressive era of Jim Crow all combined to mire the southern Blackbelt in a seemingly irreversible decline (Materson & Trotter, 2018). What had been one of America's richest and most politically powerful regions became one of its poorest after the Civil War. Despite improvements in civil rights and economic well-being, the region continues to struggle with problems of inadequate employment opportunities, transportation, education, and other characteristics common to most low-income populations (Kirk, 2011). Many who have gained education and income have left the Blackbelt region for better opportunities elsewhere. The remaining population has a high ratio of youths to working people, which strains the region's limited ability to provide adequate childcare, education, and employment opportunities (Muller, 2021).

In the United States, poverty and poor quality-of-life conditions are neither evenly nor randomly distributed across the United States, with a large concentrations located in the South. The three Rs of poverty—race, region, and rurality (Wimberley & Morris 2002)—play an integral role in defining the Blackbelt and the history and legacy of the region. Moreover, because poverty is associated with welfare in one form or another, welfare and welfare policies have their greatest impacts, for good or ill, on the South. The South's socioeconomic impoverishment is further concentrated into a crescent of more than 600 counties with higher-than-average populations of African Americans. These counties stretch from Texas to Virginia and are located mostly in the 11 ‘Old South’ plantation states (Wimberley, 2010).

Alabama Blackbelt's poverty rate of 34.9% is twice the state's average of 18.8% and is well above the national average of 13.3% (Buckenya & Fraser, 2003). The population in the

Alabama Blackbelt has relatively shorter lifespans, lower educational attainment, and lower average per capita income compared with other Alabama counties (Fraser et al., 2005). These variables are crucial to understanding the Blackbelt region's infrastructure shortage and the need for organized community capital. Areas with shorter lifespans often need help in infrastructure development. In addition, a population with a shorter lifespan may have higher health-related issues and mortality rates, requiring adequate healthcare infrastructure such as hospitals, clinics, and medical facilities (Adler et al., 2016). Lower educational attainment is also closely linked to infrastructure shortages as it affects various aspects of socio-economic development (Hannum & Buchmann, 2005). Regions with lower educational attainment may need a more skilled workforce for infrastructure planning, construction, and maintenance. Lower average per capita income indicates limited financial resources for infrastructure investment and maintenance.

The Blackbelt area, known for its substantial proportion of minority communities, especially African Americans, has notable obstacles that affect the use of videoconferencing. As noted in the sections above, the problems in this context include inadequate educational attainment, deficient technological proficiency, absence of drive, diminished self-confidence, limited financial resources, exorbitant technology expenses, and costly internet membership fees. Adults with lower educational attainment frequently have insufficient digital literacy, which hinders their ability to properly use videoconferencing technologies (van Dijk & van Deursen, 2014). Inadequate proficiency in technology might impede the establishment and use of videoconferencing, resulting in decreased adoption rates (Helsper & Reisdorf, 2017). People who fail to see the significance or advantages of videoconferencing in their personal or professional lives may exhibit less motivation to use these technologies (Venkatesh & Brown, 2001). Individuals may be discouraged from utilizing videoconferencing technologies owing to low

self-efficacy (Alqurashi, 2016). Insufficient income hampers the capacity to buy critical gear like laptops, cell phones, and webcams, which are crucial for videoconferencing (Robinson et al., 2015). The exorbitant expense of technology may act as a barrier for several persons in the Blackbelt area, impeding their ability to get the necessary instruments for videoconferencing (Mossberger & McNeal, 2007). Costly internet subscriptions may hinder users from getting the fast internet required for efficient videoconferencing, resulting in connection problems and decreased use (Pew Research Center, 2021). It is essential to overcome these obstacles to provide fair and equal access to digital resources and opportunities.

Gaps in the Literature

The existing literature on the digital divide and the use of videoconferencing in low socioeconomic rural (LSR) communities and the Blackbelt region of Alabama provides a comprehensive overview of the barriers and challenges these populations face. Key findings include:

- Studies have shown a lack of technology use among LSR communities (Galperin & Fernanda Viecens, 2017; Rice & Haythornthwaite, 2010; Warren, 2007; Whitacre, 2017). These studies highlight the longstanding issues of limited internet access and the subsequent challenges in adopting digital technologies.
- The COVID-19 pandemic forced many LSR communities to adopt videoconferencing for daily banking, education, socializing, and healthcare (Aissaoui, 2022). The pandemic highlighted the critical need for reliable internet access, a persistent problem (Perrin, 2019).
- Minority groups, particularly African Americans and Hispanics, face significant barriers to accessing high-speed internet and digital devices (Pew Research Center, 2019, 2021).

These barriers exacerbate educational and economic disparities (Robinson et al., 2015; Warschauer & Matuchniak, 2010;).

- The availability of broadband is a critical factor in addressing the digital divide. Rural areas often lack the infrastructure needed for high-speed internet, which impacts their ability to utilize videoconferencing effectively (FCC, 2020; van Deursen & van Dijk, 2019).

Despite the comprehensive coverage of various aspects of the digital divide and technology use, several gaps remain in the research literature, particularly regarding the Blackbelt region of Alabama:

- There is a lack of targeted research on the digital divide in the Blackbelt region of Alabama. Most studies generalize findings from other rural or low-income areas without considering the Blackbelt's unique socio-cultural and economic factors.
- While general barriers to technology use among low socioeconomic communities are well-documented, limited research exists on how these barriers impact videoconferencing adoption and usage in the Blackbelt region.
- Detailed examinations of the technical infrastructure in the Blackbelt, such as internet availability, pricing, and quality, are sparse. Understanding these challenges is essential for developing effective interventions.
- Research on the cultural beliefs and psychological factors that influence technology adoption in the Blackbelt region is limited. Digital literacy, motivation, and self-efficacy must be thoroughly investigated.

By addressing these gaps, future research can provide a more nuanced understanding of the digital divide in the Blackbelt region and develop targeted strategies to improve digital inclusion and technology use among its residents.

Summary

Chapter 2 provides a comprehensive literature review on the digital divide and the use of videoconferencing technology among low socioeconomic rural (LSR) communities, specifically focusing on the Blackbelt region of Alabama. The chapter discusses the significant barriers these communities face, including limited internet access, lack of digital devices, and insufficient digital literacy, exacerbated by the COVID-19 pandemic. Theoretical frameworks such as the Technology Acceptance Model (TAM) and Computer Self-Efficacy (CSE) are utilized to understand the factors influencing technology adoption. These models highlight the importance of perceived usefulness, ease of use, and user confidence in adopting new technologies. The chapter also examines the unique challenges faced by minority populations, particularly African Americans and Hispanics, in accessing and utilizing digital technologies. These groups experience significant disparities in internet access and digital literacy, which impact their educational and economic opportunities.

Furthermore, the chapter identified several gaps in the existing literature, emphasizing the importance of understanding cultural and psychological factors influencing technology adoption and the potential impact of effective policy measures to enhance digital access and inclusion. Chapter 2 sets the stage for addressing these gaps and provides a foundation for understanding the complex dynamics influencing the digital divide and videoconferencing use in the Blackbelt region of Alabama. The next chapter will focus on the methodology used in this study.

CHAPTER III: METHODOLOGY

The purpose of this study was to gain insight and understanding into the dynamics behind the relationship between computer self-efficacy (CSE) and Technology Acceptance Model 2 (TAM2) variables (perceived enjoyment, perceived ease of use, perceived usefulness, behavioral intention to use, attitude to use, actual use, and subjective norms) in videoconferences systems among adults living in the Blackbelt Region of Alabama. Chapter 3 details the methods used for this study, including the research questions, the sample, instrumentation, collection process, and data analysis.

Research Questions

The following questions will be examined in this study:

1. Does the educational level attained have a significant effect on computer self-efficacy?
2. Are there any significant relationships between computer self-efficacy (CSE) and age among individuals in Macon County?
3. Does income level have an effect on computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?
4. Does perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention to use (BI), attitude to use (AI), actual use (AU), and subjective norm (SN) of videoconference systems together predict computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?

Sampling and Population

The target population in this study included adult individuals who reside in Macon County, Alabama which is in the Blackbelt Region of the United States. In addition, convenience

sampling was performed to look at low socioeconomic rural status (LSR) and low socioeconomic status (SES) communities. Macon County is in East Central Alabama in the heart of the Blackbelt, which expands across parts of the southeast United States. The Blackbelt counties in Alabama are Barbour, Bullock, Butler, Choctaw, Crenshaw, Dallas, Greene, Hale, Lowndes, Macon, Marengo, Montgomery, Perry, Pickens, Pike, Russell, Sumter, and Wilcox counties. Macon County was chosen for this study because it has similar demographics to the other Blackbelt counties, including low-income families, rural community characteristics, and a high concentration of African American populations (United States Census Bureau, 2021).

The United States Census Bureau (2021) reported that Macon County's population estimates were 18,895 citizens, with African Americans making up 80% of the population, followed by Whites (17.3%) and Hispanics (1.9%). There are 7,592 households in Macon County with 21.5% being 65 years and older. It was reported that 82.3% of Macon County households have a computer and 66.9% of households have broadband internet subscriptions. In addition, the median household income was $35,450 at 2.14 persons per household in Macon County. The medium household income poverty threshold for Alabama is $33,148 and below. This compares to a United States median household income of $70,784 and $56,929 for the state of Alabama. The United States Census Bureau (2021) also reported that Macon County had 27.9% persons living in poverty, with only 20.5% of persons 25 years or older having a bachelor's degree or higher. Low income does not immediately translate to low socioeconomic status, though. SES not only includes income, but other factors such as educational attainment, financial security, subjective social status, and social class perceptions (Broer et al., 2019).

Convenience sampling took place throughout Macon County. The community survey distribution partner was chosen due to each feeding site having access to different demographics

and the ability to reach a broad portion of the population throughout Macon County. Since the Covid-19 pandemic, feeding sites have distributed food throughout Macon County provided by the USDA. To be eligible for participation in this study, individuals needed to be at least 19 years of age and live in Macon County. Out of state college students residing in Macon County, Alabama were excluded as they were not long-term citizens in the area. Demographics included senior citizens, parents, young adults, and everyone surrounding the feeding sites.

There was a total of 5 feeding sites throughout the area with each site containing food distributors. The feeding sites distribute food every two weeks and collectively serve over 4,000 people every two weeks**.** The location of these sites included Tuskegee, Notasulga, Shorter, Franklin, and South Macon. The distribution sites in these 5 towns sometimes shift to different churches within those towns. I anticipated that each of the 5 feeding sites in Macon County would provide an estimated 60 or more responses per site for more than 300 responses. These estimations were based on the current number of people in the community being served during this effort.

During the monthly Macon County feeding site zoom meetings, leading up to a food distribution, an effort was made with site coordinators to distribute flyers to participants waiting in the car line to pick up food. The site coordinators were provided with comprehensive and precise instructions on distributing the flyers. The assistance provided encompassed pertinent facts regarding target demographics, distribution techniques, locations, time, and other pertinent information essential for the successful implementation of distribution strategies. The coordinators ensured that the people tasked with distributing flyers were adequately prepared and provided with the necessary knowledge and direction to carry out the survey distribution efficiently.

Instrumentation

The survey in this study was developed and administered via the Auburn University through an online survey. Qualtrics ®, being a web-based survey software, provided a safe and secure uniform survey distribution data collection platform. A QR (quick response) code was made available for this study that allowed scanning access to participants. The QR codes were printed on flyers and distributed to participants at Macon County feeding sites. The survey combined demographic questions with questions from two well-documented survey models, the Computer Self-Efficacy Scale (Compeau & Higgins, 1995), and a modified Technology Acceptance Model 2 (Venkatesh & Davis, 2000'; VenSalloum et al, 2019). TAM2 provided a comprehensive framework for understanding the factors influencing individuals' acceptance and usage of videoconferencing systems.

Demographic Questionnaire

The first seven questions of the survey were designed to gather demographic information from participants of the study. The questions included items related to participants' gender identity, race, age, income level, education attained, technology possessed and available internet speed. This data hoped to gain insight into the range of experiences and viewpoints within the surveyed populace, augmenting the credibility and applicability of survey results. Income level selection was based on the ranges classified by Snider and Kerr (2022). Education level attained options used were those that are asked on the Unites States Census Bureau (2021) surveys, which included less than 9^{th} grade, 9^{th} to 12^{th} grade with no diploma, high school graduate / GED, some college with no degree, associate degree, and bachelor's degree or more. Technology options used to access videoconferencing were considered for the technology assessed question and included the items of desktops, laptops, smart phones, and portable tablets (Suduc et al., 2023).

Computer Self-Efficacy Survey

To measure participants' technology self-efficacy, the Computer Self-Efficacy (CSE) assessment developed by Compeau and Higgins (1995) was used in the survey. The CSE instrument is an 8-item assessment, Likert-type (7-point scale) and is one of the most used scales that looks at generalized learning on software. The typical Likert scale is a 5- or 7-point ordinal scale used by respondents to rate the degree to which they agree or disagree with a statement (Sullivan & Artino, 2013). A 7-point scale offers participants a more excellent range of response alternatives, enabling them to articulate their thoughts more precisely. In the context of videoconferencing research, capturing nuanced variations in user experiences or perceptions is crucial, including supplementary response alternatives that enhance the precision of participants' attitudes or behaviors. Parametric statistical procedures, such as analysis of variance (ANOVA) or regression analysis, can be employed with higher confidence when there are seven response alternatives, and the data follows a normal distribution. In an ordinal scale, responses can be rated or ranked, but the distance between responses is not measurable. Thus, the differences between "always," "often," and "sometimes" on a frequency response Likert scale are not necessarily equal.

Based on the definition of computer self-efficacy as an individual's perception of his or her ability to use a computer to accomplish a job task, a 10-item measure of computer self-efficacy and incorporated elements of task difficulty that capture differences in self-efficacy magnitude. The measure examined the influence of task difficulty on individuals' self-efficacy perceptions to capture variations in the intensity of opinions on self-efficacy across diverse tasks or circumstances. Table 1 shows the computer self-efficacy outcomes survey categories and constructs in this study. All the measures exceeded alpha at .80 for internal consistency

reliability (Compeau & Higgins, 1995). These internal consistency reliability measures included the following: encouragement (.87), others' use (.80), support (.91), self-efficacy (.95), outcome expectation – performance (.87), outcome expectation – other (.87), affect (.87), anxiety (.87), use (.82). These are all considered to be good values as they exceed value of .80. Tavakol and Dennick (2011) stated that the number of test items, item inter-relatedness and dimensionality affect the value of alpha and that acceptable values range from .70 to .95.

Table 1

Computer Self-Efficacy Outcomes and Survey Questions

Category	Construct Survey Questions
Computer Self-efficacy	I could complete the required tasks using the computer if there was no one around to tell me what to do as I go. I could complete the required tasks using the computer if I had never used a 'learning tool' like it before. I could complete the required tasks using the computer if I had only the 'learning tool' manuals for reference. I could complete the required tasks using the computer if I had seen someone else using it before trying it myself. I could complete the required tasks using the computer if I could call someone for help if I got stuck. I could complete the required tasks using the computer if someone else had helped me get started. I could complete the required tasks using the computer if I had a lot of time to complete the task for which the 'computer' was provided. I could complete the required tasks using the computer if I had just the built-in help facility for assistance. I could complete the required tasks using the computer if someone showed me how to do it first. I could complete the required tasks using the computer if I had used a similar 'computer like this one before to do the task.

Note: *Adapted to videoconferencing (see Compeau & Higgins, 1995).

Technology Acceptance Model 2 Survey

The theoretical framework known as the Technology Adoption Model 2 (TAM2) is utilized to find insights into and forecast individuals' adoption and utilization of

videoconferencing systems (Venkatesh & Davis, 2000). Researchers can assess the impact of individuals' perceptions of utility, ease of use, attitudes, and external influences on their intention to use videoconferencing systems by gathering data on these constructs using surveys or interviews. Furthermore, scholars can evaluate usage patterns to ascertain how individuals interact with videoconferencing technology inside authentic environments.

The constructs of TAM2 for this study were Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), Attitude Towards Use (ATT), Actual Use (AU), Behavioral Intention to Use (BI) and Subjective Norm (SN) (see Table 2). Perceived usefulness (PU) is defined here as the degree to which a person believes that using a particular system would enhance their performance. PU follows from the definition of useful, which means capable of being used advantageously (Davis, 1989). A system high in perceived usefulness is one for which a user believes in a positive use-performance relationship. Gibson and O'Donnell (2009) stated that perceived usefulness refers to how useful and helpful the user thinks the technology is for themselves or their group and how well they judge it can carry out necessary tasks. Perceived ease of use (PEOU) refers to the degree to which a person believes that using a particular system would be free of effort. PEOU follows from the definition of "ease," which means freedom from difficulty or great effort (Davis, 1989). All else being equal, we claim, an application perceived to be easier to use than another is more likely to be accepted by users. Perceived ease of use also relates to how comfortable individuals are using the technology and whether they think that a lot of effort requires in using it or not (Gibson & O'Donnell, 2009). While in the literature, variables such as CSE are used to predict the TAM2 constructs, we wanted to understand the how the constructs might change in different contexts and populations. TAM can be employed to predict

self-efficacy under certain circumstances and provide further insight into technology acceptance and adoption (Holden & Rada, 2011).

Table 2

Technology Acceptance Model 2 Outcomes and Survey Questions

Category	Construct Survey Questions
Perceived Enjoyment	I find the utilization videoconference system to be fun. My imagination is stimulated by using the videoconference system. The videoconference system environment is enjoyable. The use of the videoconference system is a fun activity. The use of the videoconference system arouses my curiosity. There is clarity and understanding in my interaction with the videoconference system.
Perceived Ease of Use	The videoconference system is easy to use for me. Interacting with the videoconference system does not require a lot of my mental effort. My interaction with the videoconference system is clear and understandable.
Perceived Usefulness	The videoconference system enhances my learning performance. My productivity is elevated through the utilization of videoconference system in my study. Using the videoconference system enhances my learning effectiveness. I find the videoconference system to be useful in my learning.
Attitude Towards Use	I feel positive about using videoconference systems. I like using videoconference systems. The videoconference system provides a desirable learning environment.
Behavioral Intention to Use	I intend to make use of the content and functions of videoconference system for helping my academic activities. I will give my recommendation to others to use the videoconference system. I will use the videoconference system on a regular basis in the future. I use the videoconference system sometimes.
Actual Use	I use the videoconference daily. I use the videoconference on rare occasions.

Note: *Adapted to videoconferencing (see Salloum et al., 2019)

Subject norm is an important variable influencing IT usage behavior (Compeau & Higgins, 1995). Subjective norm (SN) is considered a part of the social influence variable and

signifies the perceived social pressure to carry out or avoid a behavior (Azjen, 2011). Constructs for subjective norm are shown in Table 3. The instrument used for the subjective norm variable in this study included 5 items with a 7-point Likert-type scale.

Table 3

Social Influencer Outcomes and Survey Questions

Category	Construct Survey Questions
Subjective Norm	I should participate in the videoconference activities, according to others. I should make use of the videoconference system, as per the people whose opinions I consider worthy. My friends think that I should use the videoconference system.

Note: *Adapted to videoconferencing (see Salloum et al., 2019)

Data Analysis

Data were analyzed using Statistical Product and Service Solutions (SPSS) software version 29. Research questions two and four for this study were analyzed using linear regression and multiple linear regression analysis to reflect significant interactions. Regression was used to express the relationship between a variable of interest and a set of related predictor variables (Montgomery et al., 2020). Multiple linear regression is a statistical technique that examines the relationship between several independent variables, also known as predictor variables, and a single continuous dependent variable, also known as the outcome variable (Turvey, 2013). The simple linear regression model includes two or more independent variables, broadening its scope beyond a single independent variable.

Research questions one and three for this were analyzed using one way analysis of variance (ANOVA). ANOVA is a statistical method employed to assess the means of many groups to ascertain the presence of statistically significant disparities (Weissgerber et al., 2018). It analyzes the variability between groups and within groups to determine if the observed

variations in means are statistically significant beyond what would be expected by random chance. Table 4 displays the research questions for this study in addition to both independent and dependent variables. This study focused on the relationship computer self-efficacy (CSS) has among not only TAM2 constructs, but also the demographic age, income levels, and education attained as well. Collecting demographic data allowed for a better understanding of the background characteristics of the audience and to determine whether the study's participants are a representative sample of the target population.

Table 4

Independent and Dependent Variables for Research Questions

Research Question	Independent Variable	Dependent Variables
Q1. Does the educational level attained have a significant effect of computer self-efficacy among individuals in Macon County?	Computer Self-efficacy	Education Level Attained
Q2. Are there any significant relationships between computer self-efficacy (CSE) and age among individuals in Macon County?	Age	Computer Self-efficacy
Q3. Does income level have an effect on computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?	Computer Self-efficacy	Income Levels
Q4. Does perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention to use (BI), attitude to use (AI), actual use (AU), and subjective norm (SN) of videoconference systems together predict computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?	Perceived enjoyment, perceived ease of use, perceived usefulness, behavioral intention, attitude intention, actual use, and subjective norm	Computer Self-efficacy

Summary

Chapter 3 discussed the methods that were used to complete this study. The purpose of the study was discussed, and research questions were presented. The sampling of the target of the population and participants was explained. Finally, instrumentation and data collection methods for the study were described. Chapter 4 will discuss the findings and results of the study.

CHAPTER IV: RESULTS

The aim of this study was to analyze factors that can predict videoconference platforms use in low socioeconomic rural (LSRs) populations. Survey distribution began on June 19, 2023, and concluded 10 weeks later September 27, 2023. Survey distribution was extended to ensure there were enough responses for the study. Over 500 individuals were contacted regarding participating in the study, with a total of 291 responses collected from survey distribution throughout Macon County. However, 16 of the responses were discarded due to having less than 60% response completion (Sammut et al., 2021). As a result, 275 responses were recorded, leaving a usable rate of an estimated 95%. SPSS version 29 was used to generate descriptive statistics, conduct one-way ANOVA analyses, simple linear regression analysis, and multiple linear regression analysis. The Cronbach's Alpha for all variables were calculated for this study and presented in Table 5. From this table, all variables in this study had acceptable Cronbach's Alpha levels which ranged from .76 to .94, and therefore variables in the data showed covariance.

Table 5

Reliability for Survey Constructs (TAM2 and CSE)

Construct	α	N of Items
AU (actual use)	.76	3
ATT (attitude toward use)	.85	3
PE (perceived enjoyment)	.88	3
PEOU (perceived ease of use)	.88	3
PU (perceived use)	.93	3
BI (behavioral intention)	.85	3
SN (subjective norm)	.88	3
CSE (computer self-efficacy)	.94	10

Research Questions

The research questions for this study included:

Research Question 1: Does the educational level attained have a significant effect on computer self-efficacy among individuals in Macon County?

Research Question 2: Are there any significant relationships between computer self-efficacy (CSE) and age among individuals in Macon County?

Research Question 3: Does income level have an effect on computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?

Research Question 4: Does perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention to use (BI), attitude to use (AI), actual use (AU), and subjective norm (SN) of videoconference systems together predict computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?

Research Question One

Does educational level attained have a significant effect on computer self-efficacy?

Research Question 1 was tested to see if all assumptions for one-way ANOVA were met as shown in Figure 1 below. A formal statistical evaluation of whether a particular dataset has a normal distribution may be obtained using the Shapiro-Wilk test (Sainani, 2012). The participants' perceived level of Computer Self-Efficacy (CSE) score was not normally distributed (see Table 6), as assessed by Shapiro-Wilk's test (p = .05).

Figure 1

Research Question 1 Flow Chart Summary

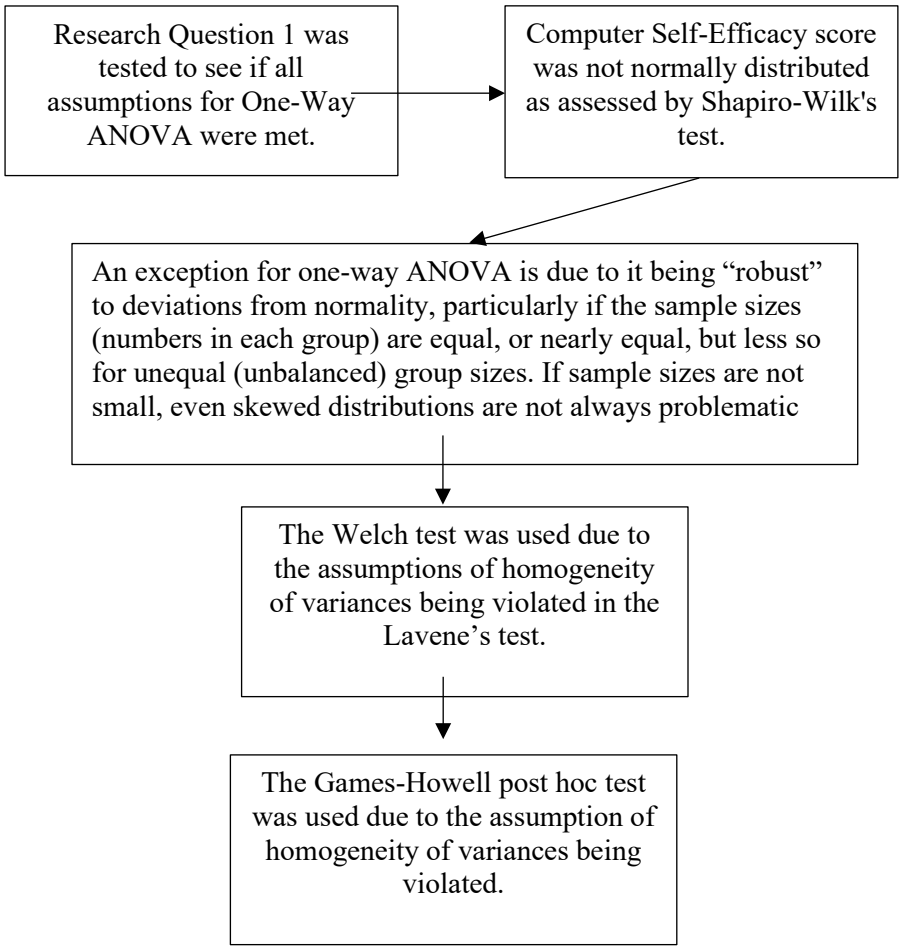


Table 6

Tests of Normality for Computer Self-Efficacy (CSE) by Education Level Attained

	What is the highest level of education you have attained?	Shapiro-Wilk[a]		
		Statistic	*df*	*p-value*
CSE	< High School Diploma	.82	6	.080
	High School Diploma or GED	.93	55	.005
	Bachelor's or Associate Degree	.89	85	<.001
	Master's / Professional Degree >	.79	126	<.001

[a.] Lilliefors Significance Correction

Even though normality was violated, one-way ANOVA is "robust" to deviations from normality, particularly if the sample sizes are equal, or nearly equal (Lix et al., 1996). Given the sample size obtained in this study (275 responses), even skewed distributions are not always problematic (Sawilowsky & Blair, 1992). As assessed by Levene's test for equality of variances, the assumption of homogeneity of variances was violated (p = .01) (see Table 7). This indicates differences in the CSE scores within the educational level groups.

Table 7

Tests of Homogeneity of Variances for Computer Self-Efficacy and Education Level Attained

		Levene Statistic	*df1*	*df2*	*p-value*
CSE	Based on Mean	3.85	3	268	.01

The Welch test was then used due to the assumptions of homogeneity of variances being violated in the Levene's test. Participants' perceived levels of computer self-efficacy (CSE) were statistically significantly different for the distinct levels of education attained using Welch's $F(3, 22.943) = 5.525$, $p = .005$ (see Table 8) and an eta square of .076, indicating a medium effect size, according to Cohen (1988).

Table 8

Robust Test of Equality Means

	Statistic[a]	*df1*	*df2*	*p-value*
Welch	5.53	3	22.94	.005

[a]. Asymptotically F distributed.

Lastly, the Games-Howell post hoc test (Table 9) was used due to the assumption of homogeneity of variances being violated. The analysis revealed that the mean was higher from "High school diploma or GED" responses ($M = .93$, $SD = .25$) to Master's / professional degree or beyond" responses (1.68 - mean difference), 95% CI [-0.079, 0.9312], and was statistically significant ($p = .002$). In conclusion, educational level attained was found to have a significant effect on perceived level of computer self-efficacy ($p < .05$).

Table 9

Games-Howell Post Hoc Comparisons

Education Level Attained	Education Level Comparison	Mean Difference	Std. Error	*p-value*	95% Confidence Interval	
					Lower Bound	Upper Bound
Bachelor's or Associate's Degree	High school diploma or GED	0.5	0.26	0.24	-0.19	1.19
	Less than a high school diploma	1.25	1.06	0.61	-2.59	5.09
	Master's / Professional Degree or beyond	-0.43	0.19	0.13	-0.93	0.079
High school diploma or GED	Less than a high school diploma	0.75	1.06	0.89	-3.07	4.57
	Master's / Professional Degree or beyond	-.93*	0.25	0.002	-1.57	-0.28
Less than a high school diploma	Master's / Professional Degree or beyond	-1.68	1.05	0.46	-5.52	2.17

Note. *The mean difference is significant at $p < 05$.

The analysis revealed that the mean higher from "High school diploma or GED" responses (M = 0.93, SD = 0.25) to Master's / professional degree or beyond" responses (M = 1.68, SD = 1.05, 95% CI [-0.079, 0.9312]) was statistically significant (p = .002). In conclusion, educational level attained was found to have a significant effect on perceived level of computer self-efficacy *($p <$* .05).

Research Question Two

Are there any significant relationships between computer self-efficacy (CSE) and age among individuals in Macon County?

Research Question 2 was tested to see if all assumptions for linear regression were met as shown in Figure 2. A scatterplot of computer self-efficacy against age was plotted (Figure 3).

Figure 2

Research Question 2 Flow Chart Summary

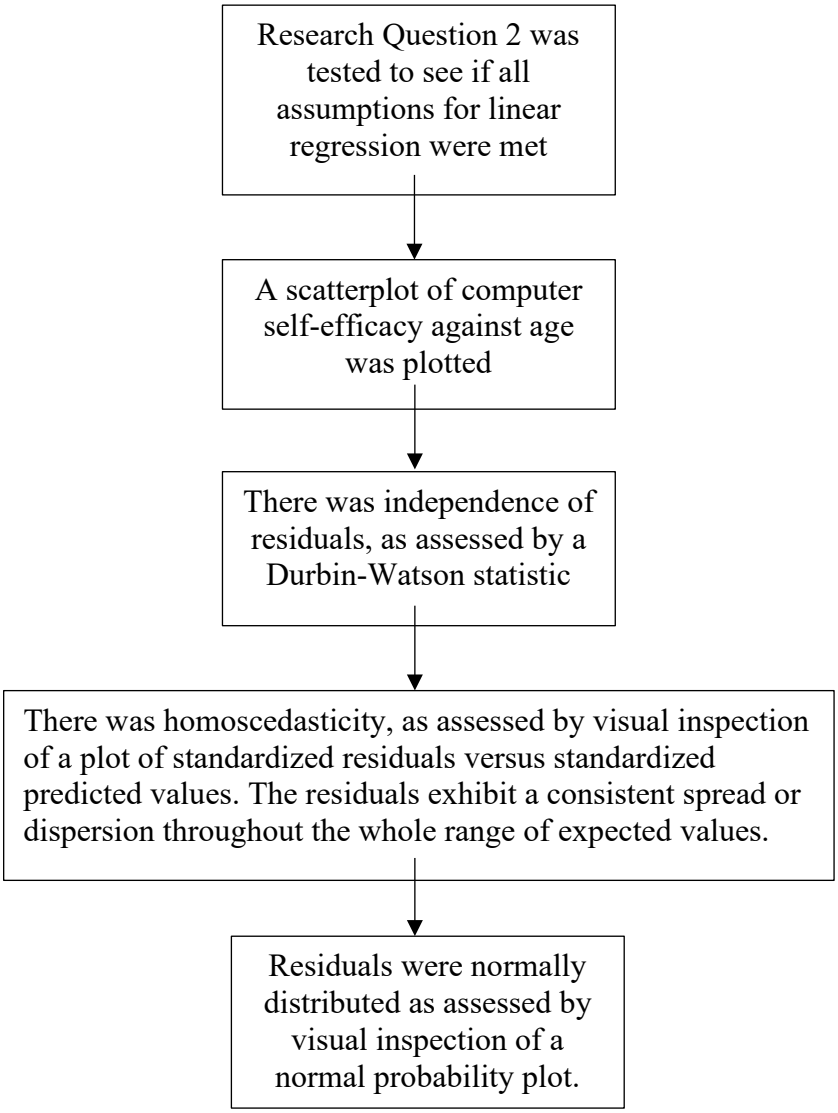
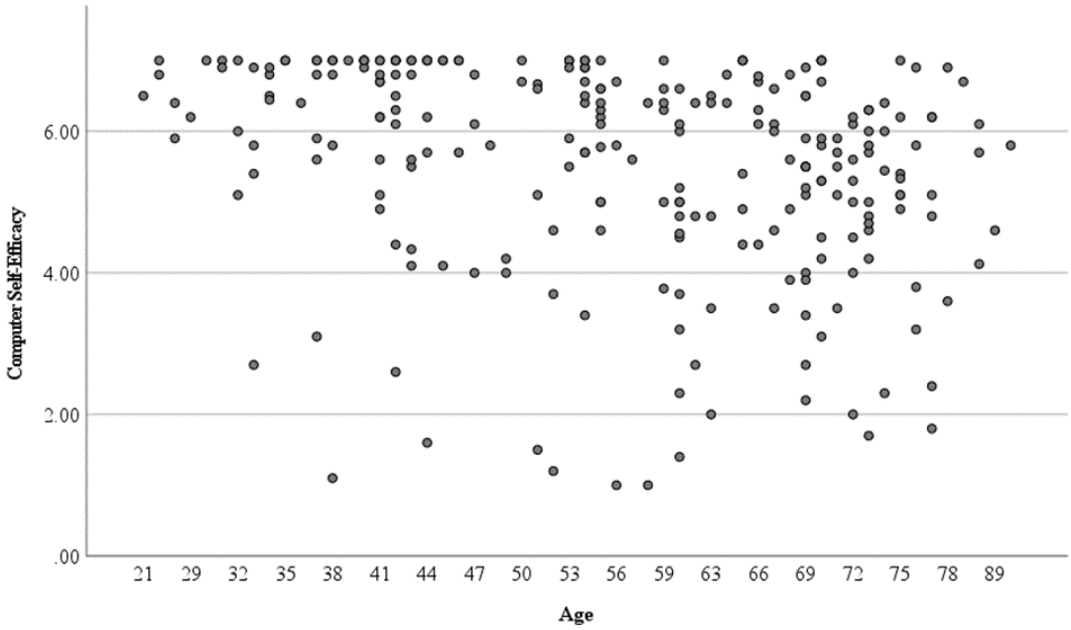


Figure 3

Scatterplot of Computer Self-Efficacy against Age



Visual inspection of this scatterplot indicated a significant scatter among the variables of CSE and Age. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.91 (see Table 10).

Table 10

Durbin-Watson Model Summary[b]

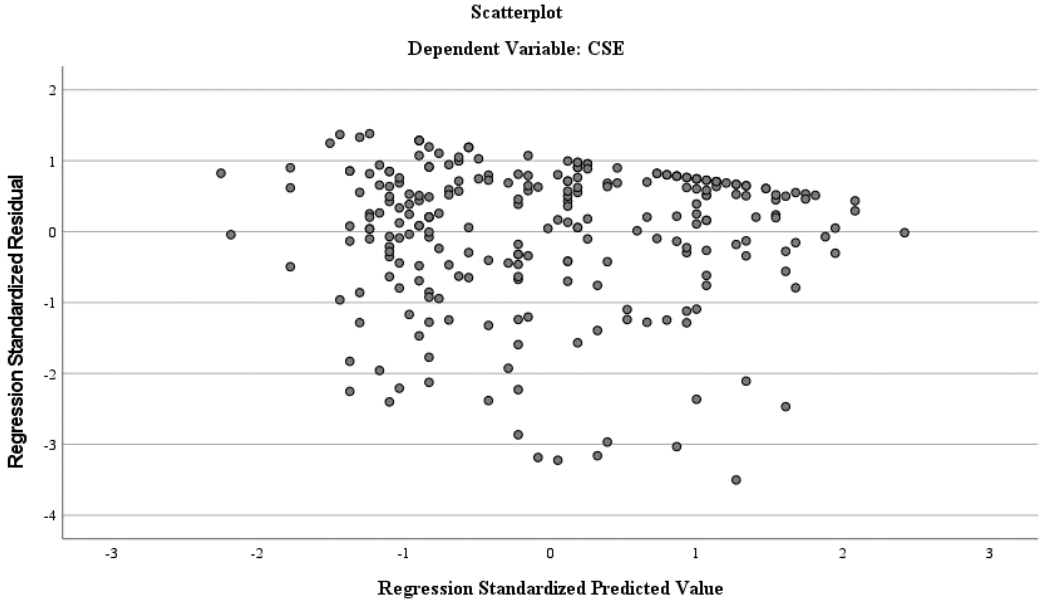
Model	*R*	R^2	Adjusted R^2	Std. Error of the Estimate	Durbin-Watson
1	.26[a]	.065	.062	1.45	1.91

[a.] Predictors: (Constant), Age
[b.] Dependent Variable: Computer Self Efficacy

There was homoscedasticity, as assessed by visual inspection of a plot of standardized residuals versus standardized predicted values (see Figure 4). The residuals exhibit a consistent spread or dispersion throughout the whole range of expected values.

Figure 4

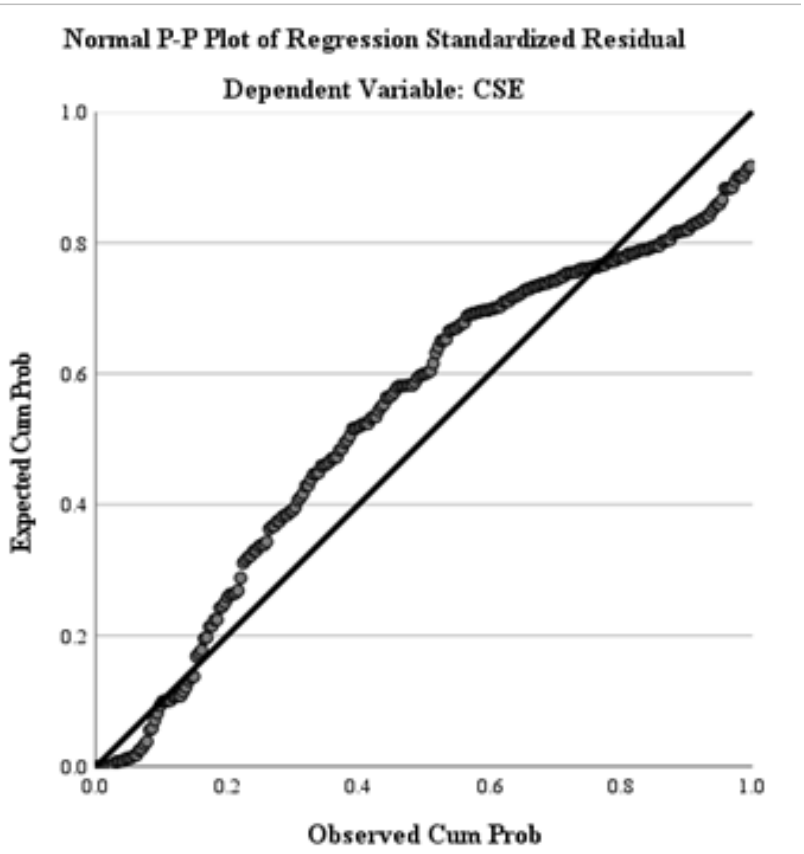
Regression Standardize Scatterplot Self-Efficacy against Age



Residuals were not normally distributed as assessed by visual inspection of a normal probability plot (Figure 5). The residuals, which represent the disparities between the observed and anticipated values, were determined to follow a distribution that is nearly normal. The evaluation was conducted by a visual examination of a normal probability plot depicting the residuals.

Figure 5

Normal P-Plot of Regression Standardize Residual – Computer Self-Efficacy



Age accounted for 6.5% of the variation in computer self-efficacy with adjusted R^2_{adj} = 6.2%, a medium size effect (Cohen, 1988) (see Table 11).

Table 11

Adjusted R^2 Model Summary

Model	*R*	R^2	Adjusted R^2	Std. Error of the Estimate
1	.255[a]	.065	.062	1.45

[a.] Predictors: (Constant), Age
[b.] Dependent Variable: Computer Self Efficacy

As shown in Table 12, age significantly predicted computer self-efficacy, $F(1, 271) = 18.92$, $p < .001$. According to the findings, as Age increases there is a decrease in perceived levels of CSE and that age was statistically significant.

Table 12

Computer Self -Efficacy and Age ANOVA[a]

Model		Sum of Squares	*df*	Mean Square	*F*	*p - value*
1	Regression	39.76	1	39.76	18.92	<.001[b]
	Residual	571.73	271	2.10		
	Total	611.49	272			

[a.] Dependent Variable: CSE
[b.] Predictors: (Constant), Age

Table 13 shows that the unstandardized coefficient (B) for the constant is 7.037 with a standard error of .364, indicating the predicted value of Computer Self Efficacy (CSE) when Age is zero. The unstandardized coefficient for Age is -.027 with a standard error of .006, showing that for each additional year of age, perceived levels of CSE decrease by .027 units. The standardized coefficient (Beta) for Age is -.255, indicating the strength and direction of the relationship between Age and CSE. The *t*-values and significance levels for both the constant (19.335, $p < .001$) and Age (-4.349, $p < .001$) show that both coefficients are statistically significant.

Table 13

Computer Self-Efficacy and Age Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.037	0.364		19.335	<.001
	Age	-0.027	0.006	-0.255	-4.349	<.001

[a.] Dependent Variable: Computer Self Efficacy

In conclusion, there are significant relationships between perceived levels of computer self-efficacy (CSE) and age among individuals living in Macon County.

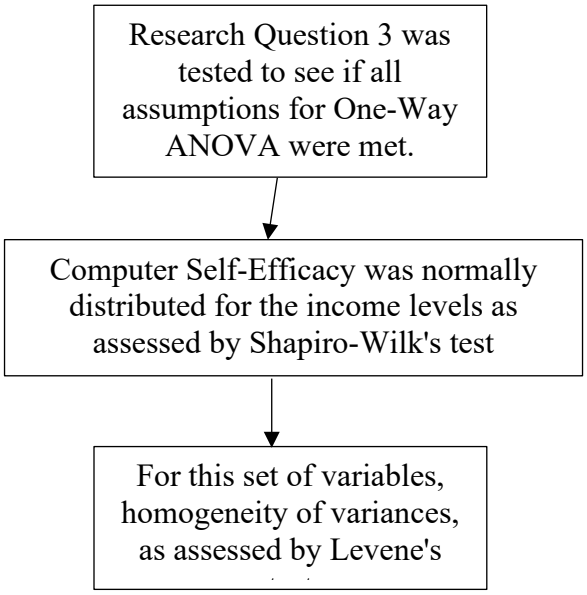
Research Question Three

Does income level have an effect on computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?

Research Question 3 was tested to see if all assumptions for one-way ANOVA were met as shown in Figure 6.

Figure 6

Research Question 3 Flow Chart Summary



Perceived levels of computer self-efficacy were normally distributed for income levels "$125,000 - $149,000, as assessed by Shapiro-Wilk's test (p = .05) and all other income levels were not normally distributed (Table 14).

Table 14

Tests of Normality for Computer Self-Efficacy with Income Level

		Shapiro-Wilk[a]		
	Income Level	Statistic	*df*	*p-value*
CSE	Under $25,000	.93	45	.007
	$25,000 - $49,999	.87	53	< .001
	$50,000 - $74,999	.85	82	< .001
	$75,000 - $99,999	.76	42	< .001
	$100,000 - $124,999	.84	19	.005
	$125,000 - $149.999	.83	6	.110
	$150,000 and Higher	.86	22	.005

[a]Lilliefors Significance Correction

Homogeneity of variances, as assessed by Levene's test (Table 15), for equality of variances (p = *0.18*) were equal. The variance across all groups was similar and supports the assumption of normality.

Table 15

Tests of Homogeneity of Variances for Computer Self-Efficacy with Income Level

		Levene Statistic	*df1*	*df2*	*p-value*
CSE	Based on Mean	1.50	6	266	.18

Participants perceived levels of computer self-efficacy (CSE) were statistically significantly for the different levels of income, $F(6, 266) = 3.043$, $p = .007$ (Table 16) and the eta square was .077 indicating a medium effect size (Cohen, 1988).

Table 16

Computer Self-Efficacy and Income Levels ANOVA

	Sum of Squares	*df*	Mean Square	*F*	*p-value*
Between Groups	38.89	6	6.48	3.04	.007
Within Groups	558.08	266	2.13		
Total	596.97	272			

Table 17 shows there was a decrease in perceived levels of Computer Self-Efficacy (CSE) from income levels "$75,000 - $99,999" ($M = 6.1$, $SD = 1.3$) to the income levels "Under $25,000" ($M = 4.9$, $SD = 1.7$), and a mean difference of -1.17, 95% CI [-2.1, -0.24], which was statistically significant ($p = .004$).

Table 17

Tukey Multiple Comparisons with Computer Self-Efficacy and Income Level

Income Level	Income Level Categories	Mean Difference	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Under $25,000	$25,000 - $49,999	-0.4	0.3	0.82	-1.28	0.47
	$50,000 - $74,999	-0.79	0.27	0.06	-1.6	0.01
	$75,000 - $99,999	-1.17	0.31	0.004	-2.1	-0.24
	$100,000 - $124,999	-0.37	0.4	0.97	-1.56	0.81
	$125,000 - $149.999	-1.01	0.63	0.69	-2.89	0.88
	$150,000 and Higher	-0.9	0.38	0.21	-2.03	0.23
$25,000 - $49,999	$50,000 - $74,999	-0.39	0.26	0.74	-1.15	0.38
	$75,000 - $99,999	-0.77	0.3	0.15	-1.66	0.13
	$100,000 - $124,999	0.03	0.39	1	-1.13	1.19
	$125,000 - $149.999	-0.6	0.63	0.96	-2.47	1.26
	$150,000 and Higher	-0.5	0.37	0.83	-1.6	0.6
$50,000 - $74,999	$75,000 - $99,999	-0.38	0.28	0.82	-1.2	0.44
	$100,000 - $124,999	0.42	0.37	0.92	-0.68	1.53
	$125,000 - $149.999	-0.22	0.62	1	-2.05	1.62
	$150,000 and Higher	-0.11	0.35	1	-1.15	0.93
$75,000 - $99,999	$100,000 - $124,999	0.8	0.4	0.43	-0.4	2
	$125,000 - $149.999	0.16	0.64	1	-1.73	2.06
	$150,000 and Higher	0.27	0.38	0.99	-0.87	1.41

$100,000 - $124,999	$125,000 - $149.999	-0.64	0.68	0.97	-2.67	1.39
	$150,000 and Higher	-0.53	0.46	0.91	-1.89	0.83
$125,000 - $149.999	$150,000 and Higher	0.11	0.67	1	-1.89	2.1

However, no other income levels differences were statistically significant. In conclusion, income level has a significant effect on perceived levels of computer self-efficacy (CSE) among individuals residing in Macon County, Alabama.

Research Question Four

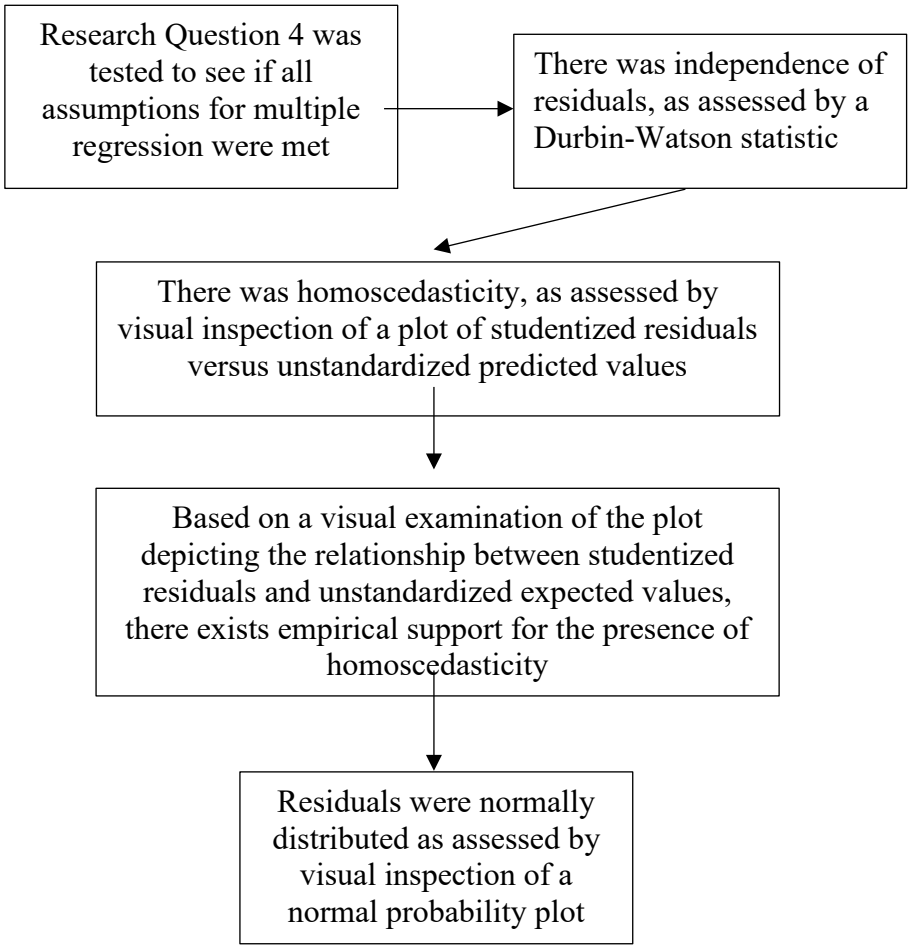
Does perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention to use (BI), attitude to use (AI), actual use (AU), and subjective norm (SN) of videoconference systems together predict computer self-efficacy (CSE) among individuals residing in Macon County, Alabama?

As noted earlier, while in the literature, although variables such as CSE are used to predict the TAM2 constructs, we wanted to understand the how the constructs might change in different contexts and populations (the Blackbelt region, low socioeconomic status and rural communities).Thus, TAM can be employed to predict self-efficacy under certain circumstances and provide further insight into technology acceptance and adoption (Holden & Rada, 2011).

Research Question 4 was tested to see if all assumptions for multiple regression were as shown in Figure 7.

Figure 7

Research Question 4 Flow Chart Summary



There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.962 (see Table 18).

Table 18

Computer Self Efficacy and Technology Acceptance Predictors Durbin Watson Model Summary[b]

Model	*R*	R^2	Adjusted R^2	Std. Error of the Estimate	Durbin-Watson
1	.67[a]	.45	.44	1.13	1.96

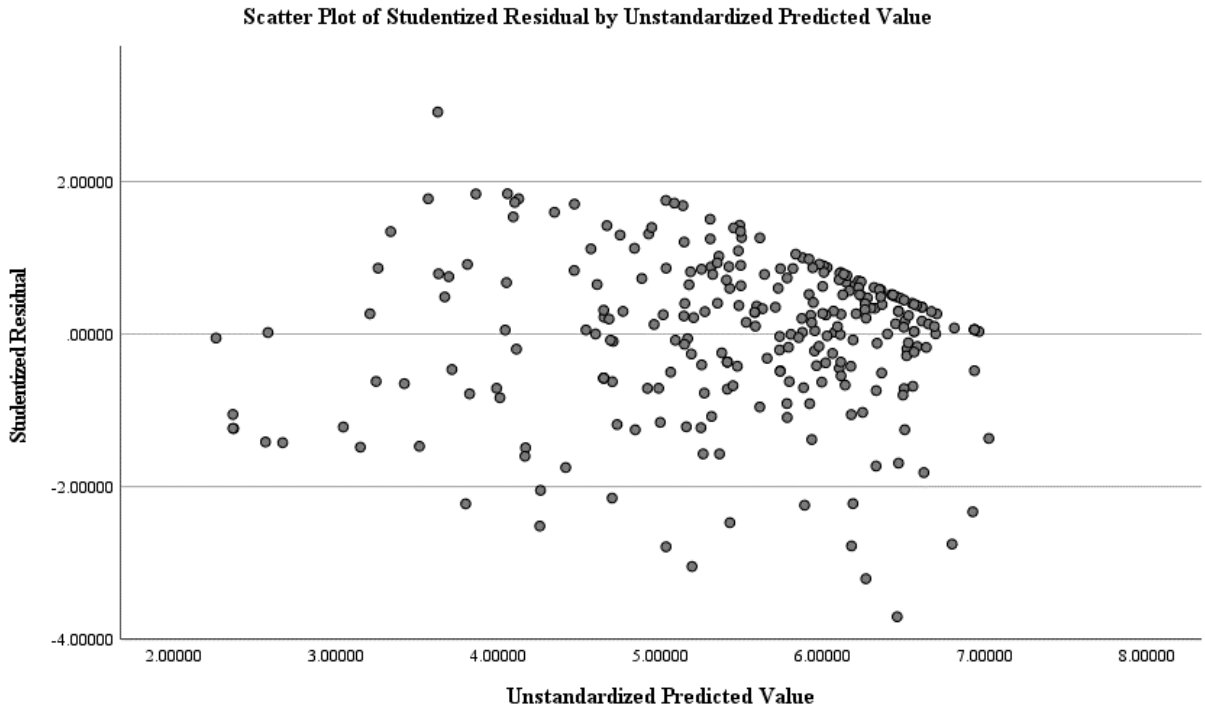
[a] Predictors: (Constant), ATT, SN, AU, PE, PEOU, PU, BI
[b] Dependent Variable: CSE

Note. ATT = attitude towards use; SN = subjective norm; AU = actual use; PE = perceived enjoyment; PEOU = perceived ease of use; PU = perceived usefulness; BI = behavioral intention; CSE = computer self-efficacy.

Homoscedasticity was assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values (see Figure 8). Based on a visual examination of the plot depicting the relationship between studentized residuals and unstandardized expected values, there exists empirical support for the presence of homoscedasticity. This suggests that the residuals exhibited a constant amount of variability across various levels of the predicted values inside the regression model.

Figure 8

Scatter Plot of Studentized Residuals by Unstandardized Predicted Value



Similar to scatterplot observed in Figure 8, residuals were not normally distributed as assessed by visual inspection of a normal probability plot (see Figure 9).

Figure 9

Normal P-Plot of Regression Standardized Residual

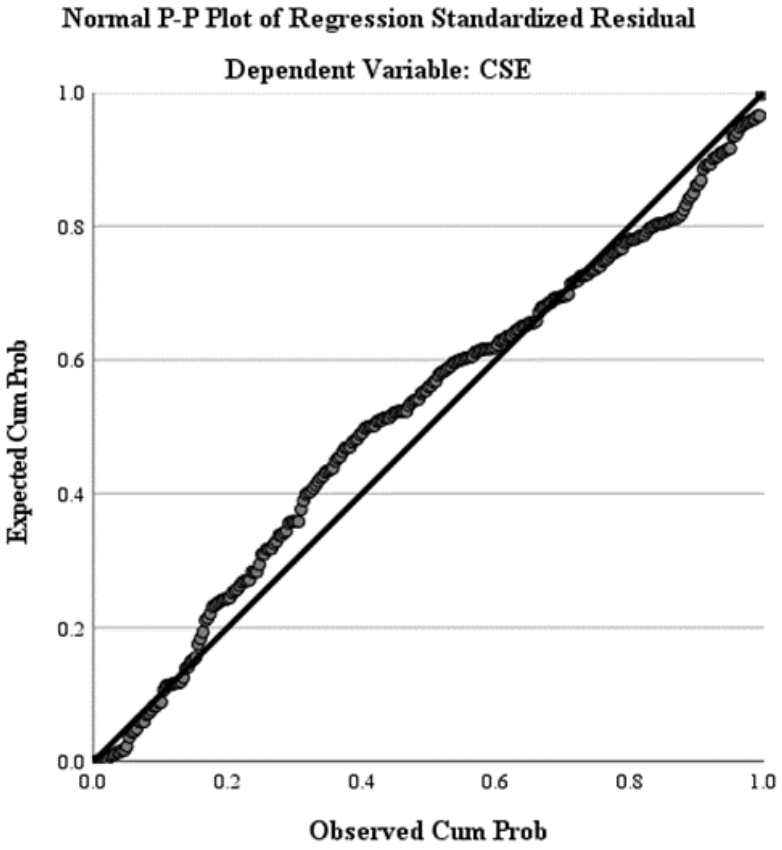


Table 19 shows the R^2 or the overall model was 45.4% with an adjusted R^2 of 44%, a large size effect according to Cohen (1988). This value indicates that 45.4% of the variance in (CSE) can be accounted for by the linear combination of the SN (subjective norm), AU (actual use), PEOU (perceived ease of use), PE (perceived enjoyment), BI (behavioral intention to use), and ATT (attitude toward use). As shown in Table 20, this suggested that the combined influence SN, AU, PEOU, PE, BI, and ATT accounted for a significant portion of the variance in computer self-efficacy (CSE). Specifically, 45.4% of the variance in CSE was predictable from these six factors combined, indicating that these variables together have a strong predictive power regarding individuals' beliefs in their ability to use computer technology effectively.

Table 19

Model Summary using TAM2 Constructs as Predictors

Model	*R*	R^2	Adjusted R^2	Std. Error of the Estimate
1	.67[a]	.45	.44	1.13

[a] Predictors: (Constant), ATT, SN, AU, PE, PEOU, PU, BI

Note. ATT = attitude towards use; SN = subjective norm; AU = actual use; PE = perceived enjoyment; PEOU = perceived ease of use; PU = perceived usefulness; BI = behavioral intention.

The linear combination of variables attitude towards use (ATT), subjective norm (SN), actual use (AU), perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), and behavioral intention (BI) statistically significantly predicted Computer Self-Efficacy (CSE), $F(7, 265) = 31.47$, $p < .001$ (Table 20).

Table 20

Computer Self Efficacy and Technology Acceptance Predictors ANOVA[a]

Model		Sum of Squares	*df*	MS	*F*	*p-value*
1	Regression	280.45	7	40.07	31.47	<.001[b]
	Residual	337.39	265	1.27		
	Total	617.84	272			

[a.] Dependent Variable: CSE

[b.] Predictors: (Constant), ATT, SN, AU, PE, PEOU, PU, BI

Note. ATT = attitude towards use; SN = subjective norm; AU = actual use; PE = perceived enjoyment; PEOU = perceived ease of use; PU = perceived usefulness; BI = behavioral intention; CSE = computer self-efficacy.

However, only AU (actual use), ATT (attitude toward use), and PEOU (perceived ease of use) were significant predictors, including *t*-test results (Table 21). According to the regression models, it was found that as AU ($t = 2.86$, $p = .005$), ATT ($t = 2.49$, $p = .013$), and PEOU ($t = 4.47$, $p < .001$) increased, there was a significant increase in CSE (computer self-efficacy). There was no evidence of multicollinearity, meaning that there was no linear relationship between the predictor variables. In conclusion, AU (actual use), ATT (attitude toward use), and PEOU (perceived ease of use) of videoconference systems were significant predictors of computer self-efficacy (CSE) among individuals residing in Macon County, Alabama.

Table 21

Coefficient Table with Computer Self-Efficacy as Dependent Variable

Constructs	*t*	*p-value*	95% Confidence Interval		Collinearity Statistics	
			Lower Bound	Upper Bound	Tol.	VIF
AU	2.86	.005	.058	.31	.64	1.56
ATT	2.49	.013	.048	.41	.23	4.31
BI	1.89	.06	-.007	.33	.28	3.6
PE	-.68	.5	-.21	.1	.33	3.03
PEOU	4.47	<.001	.19	.48	.37	2.72
PU	-1.34	.18	-.26	.049	.34	2.92
SN	.24	.81	-.1	.13	.54	1.87

Note. Dependent Variable: Computer Self Efficacy (CSE). AU = actual use; ATT = attitude towards use; BI = behavioral intention; PE = perceived enjoyment; PEOU = perceived ease of use; PU = perceived usefulness; SN = subjective norm

Summary

The research questions for this study were analyzed using data collected from 275 survey respondents in Macon County, Alabama. Results showed that CSE (computer self-efficacy) was

significantly within age, education attainment, and income levels. In addition, only AU (actual use), ATT (attitude toward use), and PEOU (perceived ease of use) were significant predictors of CSE (computer self-efficacy) among participants residing in Macon County, AL. These findings provide more clarity into the dynamics surrounding videoconference use in low socio-economic rural communities (LSR). Chapter 5 will discuss the meaning of these results in relation to existing theory and available literature.

CHAPTER V: DISCUSSION

Chapter 5 presents the main conclusions derived from Chapter 4. The subsequent analysis involves a juxtaposition of the literature with the practical ramifications of the results. This section acknowledges the limitations of the study and provides recommendations for future research.

Research Question 1

Does the educational level attained have a significant effect on computer self-efficacy among adults in Macon County?

In this study, the educational level attained was observed to have a significant effect on perceived levels of computer self-efficacy (CSE) among adults living in Macon County, Alabama. The test results were statistically significant with a Welch's F value of 5.525 and a p-value of .005. This means there was strong evidence that the differences observed were not due to random chance. In addition, the effect size had an eta squared value of .076, which indicated a medium effect size, and thus, suggests a moderate effect of education level on perceived level of computer self-efficacy (CSE). In addition, the analysis revealed that there was a significant difference between respondents holding a High School Diploma or GED and those who possessed a Master's or Professional degree.

The findings are comparable to the others referenced in the research literature. For example, Smith and Brown (2018) discovered a positive correlation between higher levels of education and increased computer self-efficacy. Individuals who have obtained higher education typically have greater exposure to technology and receive formal instruction in computer skills, which in turn improves their self-efficacy. Jackson et al. (2020) highlighted the importance of academic institutions in fostering CSE. Educational achievement was a powerful predictor of

computer self-efficacy since educational institutions play a crucial role in equipping individuals with the necessary skills and confidence. Jackson et al. (2020) also indicated that people who have obtained a higher levels of education are more likely to possess a greater sense of confidence and ability in using computers. This increased CSE may give adults an advantage in achieving success in both academic and professional settings, particularly in situations that include videoconferencing abilities.

Schunk (2012) found that compared with students who doubt their capabilities, those with high self-efficacy participate more readily, work harder, persist longer, show greater interest in learning, and achieve at high levels. He goes on to state that people with low self-efficacy may believe that things are more complex than they are – a belief that can foster anxiety and stress and leave few choices for how to solve problems. Nelson and Ketelhut (2008) found that learners with low levels of initial self-efficacy in science viewed fewer guidance messages than their higher-efficacy peers and did not perform as well as their higher-efficacy peers regardless of guidance use level. Theoretically, this lack of self-efficacy could also lead to the lack of initiative to seek opportunities to pursue higher levels of education. Incorporating social cognitive theory (Bandura, 1986) into the theoretical framework for this study clarifies the intricate relationship between educational attainment and computer self-efficacy and underscores the significance of educational encounters in influencing people's attitudes and actions about computer use.

Research Question 2

Are there any significant relationships between computer self-efficacy (CSE) and age among adults in Macon County?

A relationship between age and computer self-efficacy through videoconference use was also significant among adults living in Alabama's Blackbelt Region. Age explained 6.5% of the

differences in how confident adults feel about using computers. This means that while age does have some impact on computer self-efficacy (CSE), there are other factors that also play significant roles. The Welch test was used because another test (Levene's test) showed that the assumption that the variances are equal was not met. The Welch test found that perceived levels of CSE varied significantly depending on age. The test result was statistically significant with Welch's F value of 5.525 and a p-value of .005. This means there is strong evidence that the differences observed were not due to random chance. In addition, the linear regression found age to be a significant predictor of CSE. As age increased, there was a significant decrease in perceived levels of CSE. The standardized coefficient (Beta) for Age was -.255, indicating the strength and direction of the relationship between Age and perceived levels of CSE.

This study's findings align with Chen and Chan (2014) that emphasized that age played a crucial role in affecting computer self-efficacy. The studies conducted by Jackson et al. (2017) and Czaja et al. (2006) consistently showed that younger persons have higher levels of computer self-efficacy than older ones. Livingstone and Helsper (2007) argued that the disparities in technology use between generations can be attributed to variances in exposure, with younger generations being more engaged with digital technology earlier. This may explain why younger participants in the Alabama study may possess greater computer self-efficacy when it comes to videoconferencing. Czaja et al. (2006) and Mitzner et al. (2008) examined the challenges that older persons may face because of the natural decline in cognitive abilities and physical dexterity as we age. These problems can impact the older adults' confidence in using advanced digital technology, which is consistent with the findings of the Alabama study.

Lozoya et al. (2022) observed that less exposure to computers for older workers and, in turn, less experience, explains lower computer performance for aging workers. Less experience

may also affect CSE and lead to lower performance (Fagan et al., 2003). Chisholm et al.'s (2002) research examined an indirect effect of age on CSE and subsequent computer performance. These researchers hypothesized that individual characteristics such as age, sex, and ethnicity affected income and computer ownership, which affected CSE. They found that age only slightly impacted computer ownership. However, other research (Reed et al., 2005) revealed a significant decline in CSE with age, which supports the findings in this study. Combining social cognitive learning theories into the theoretical framework provides an in-depth awareness of the complex relationship between age and computer self-efficacy. The significance of considering cognitive, social, and experiential elements is underscored while examining the capabilities and behaviors of older adults in relation to their use of technology.

Research Question 3

Does income level have an effect on computer self-efficacy (CSE) among adults residing in Macon County, Alabama?

Findings from this study show that income levels were not normally distributed in the Alabama Blackbelt region. CSE can be impacted by income levels with the results showing that confidence in using computers varies significantly depending on income levels. CSE was statistically significantly different for different levels of income, $F(6, 266) = 3.043$, $p = .007$ and the eta square was .077 indicating a medium effect size.

DiMaggio & Hargittai (2001) indicated that higher-income people generally have greater access to technology and resources, resulting in increased levels of computer self-efficacy. This is consistent with the results of this study, which indicate that income level impacts an individual's confidence and ability to use videoconferencing technology. Individuals with higher incomes are able to acquire more advanced technology and are more likely to have had early

access to digital devices (Charness et al., 2011; DiMaggio & Hargittai, 2001). Livingstone and Helsper (2007) observed that lower-income individuals may encounter barriers such as limited computer access and internet connectivity, which might undermine their confidence in using digital technology. The context of using videoconferencing in this study emphasizes the practical consequences of income-related differences in computer self-efficacy.

Cummins and Kunkel (2014) conducted multi-national studies by comparing U.S. and European older adults in educational training and found that income was associated with the availability of resources in training. In a longitudinal study (2000–2010) on socio-demographic factors and computer use, Zhang (2013) discovered that among the social-demographic factors, income was correlated with and regressed on many computer-related outcomes, such as achievement and self-efficacy in internet use. These studies help to support the findings of the current study in relation to barriers to access and connectivity. The significance of self-efficacy beliefs in influencing behavior and accomplishment is underscored by Social Cognitive Theory (Bandura, 1986). Individuals with better socioeconomic status may possess more technological exposure, which will afford them more prospects for cultivating and enhancing their computer proficiency and self-assurance in efficiently using videoconferencing systems.

Research Question 4

Does perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention to use (BI), attitude to use (AI), actual use (AU), and subjective norm (SN) of videoconference systems together predict computer self-efficacy (CSE) among adults residing in Macon County, Alabama?

As noted earlier, in the literature, variables such as CSE are commonly used to predict the TAM2 constructs, we inverted this relationship as we were interested in their potential effect(s)

on perceived CSE in our specific population. Research Question 4 observed that perceived enjoyment (PE), perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention to use (BI), attitude to use (AI), actual use (AU), and subjective norm (SN) of videoconferencing together were significant predictors of computer self-efficacy (CSE) among individuals residing in Macon County, Alabama. This was determined using ANOVA, which gave an F value of 31.47 and a p-value of less than .001. Moreover, perceived levels of CSE were found to have individual significant relationships with AU ($p = .005$), ATT ($p = .013$), and PEOU ($p < .001$). This means that as these three factors increased, confidence in using videoconference systems also significantly increased.

According to Venkatesh and Davis's (2000), there is a substantial relationship between perceived ease of use (PEOU) and computer self-efficacy (CSE). This consistency strengthens the notion that when users see technology as user-friendly, their confidence level rises. This study discovered a notable correlation between ATT (attitude) and CSE (computer self-efficacy), which supports the findings in this study. According to Venkatesh and Davis's (2000), ATT (attitude toward use) substantially impacts users' perceptions and intentions towards technology, ultimately affecting their self-efficacy. This evidence corroborates the idea that favorable attitudes toward technology bolster individuals' self-assurance. The strong correlation between AU (actual usage) and CSE (computer self-efficacy) in this study supports the broader concept that hands-on experience with technology can improve self-confidence by fostering familiarity and competence. Although TAM 2 (Venkatesh & Davis, 2000) emphasized that PU (perceived usefulness) is favorably associated with computer self-efficacy, this study did not see a significant overall impact of PU on CSE. This mismatch may arise from contextual variations or other moderating factors that were not accounted for in the study. The TAM 2 model proposed

that the usage of BI (behavioral intention) and SN (social norms) can increase adults' confidence in technology utilization by considering social factors and forecasting behaviors. Nevertheless, this study did not discover a substantial cumulative impact of these factors on CSE, suggesting that social influences and intentions may not immediately result in improved self-efficacy. The absence of the importance of perceived enjoyment (PE) in this study implies that the internal drive or pleasure derived from employing technology may not indicate one's belief in one's own ability to succeed in this situation.

Although other studies did not focus on videoconference systems, many observed similar results when studying the relationship between TAM and CSE. Hasan (2007) results indicated that computer self-efficacy and system complexity had significant direct effects on perceived usefulness and ease of use and indirect effects on attitude and behavioral intention. Extending previous research by integrating computer self-efficacy and perceived system complexity as external variables to the technology acceptance model (TAM), this study highlighted these two factors' direct and indirect effects on system acceptance and use. Similarly, Ariff et al.'s (2012) study validated the critical role of CSE in predicting individual responses to information technology systems. They attempted to examine the impact of Computer Self-Efficacy (CSE) and the extended Technology Acceptance Model (TAM) on the behavioral intention (BI) to use Internet banking systems. Their findings unveiled indirect relationships between perceived levels of CSE and BI (behavior intention) through PU (perceived use), PE (perceived enjoyment), and PC (perceived credibility) of TAM. Also, Levy and Green's (2009) study indicated that perceived ease of use, perceived usefulness, and CSE were valid precursors for technology acceptance (as indicated by intention to use).

Social Cognitive Theory (Bandura, 1986), Andragogy (Knowles, 1980), and TAM2 (Venkatesh & Davis, 2000) together create a conceptual framework for comprehending the interplay of human characteristics, such as perceived computer self-efficacy, and contextual factors, such as age and education, along with behaviors that influence the adoption and use of technology. By examining the intricate relationship among these variables, scholars and professionals may better understand the underlying processes that shape people's attitudes and actions toward technology. This knowledge can then be used to develop more effective interventions in fostering the acceptance and utilization of technology with adults in a variety of learning experiences.

Malcom Knowles Theory and Results Summary

Higher education often offers structured technological skill development, boosting computer self-efficacy (Smith & Brown, 2018). Education gives people the skills and confidence to use technology effectively, supporting Knowles' (1980) claim that educational experiences shape adult learning. Educational environments often encourage self-directed learning, a fundamental principle of Knowles' theory, which boosts computer confidence and skill (Jackson et al., 2020). Thus, Knowles' pedagogical principles support the education-computer self-efficacy relationship. Age-related cognitive decline and limited technology exposure can indeed diminish computer self-efficacy (Czaja et al., 2006). However, according to Knowles' theory (1980), older adults can benefit from learning experiences that are more contextual and practically relevant to their lives, thereby enhancing their self-efficacy. Younger adults, who have had early and diverse digital exposure, tend to have higher computer self-efficacy due to their frequent technology interactions (Livingstone & Helsper, 2007). Therefore, Knowles' principles suggest that tailored, experience-based learning can effectively mitigate age-related

declines in computer self-efficacy, offering a hopeful perspective. Higher income increases access to resources, technology, and education, boosting computer self-efficacy (DiMaggio & Hargittai, 2001). This supports Knowles' view that practical needs and learning resources drive learning. Higher-income people have more opportunities to learn technology and self-direct, which boosts their computer self-efficacy. Thus, Knowles' theory (1980) suggests that higher income levels increase resources and opportunities, which boost adults' technology confidence and competence.

Summary of Literature Contributions

This research has the potential to make a substantial contribution to the existing body of knowledge by providing insights into the relationship between videoconference technology, socio-economic characteristics, and effectiveness in a traditionally neglected sector. This research aimed to investigate the factors that determine the usage of videoconferencing, specifically focusing on economic level, education, and age as key predictors of the digital divide. The study gave significant insights into the obstacles faced by individuals in rural and low-income regions, offering data that policymakers and technology providers may use to create focused initiatives for enhancing digital inclusion. This research investigated the social and cultural aspects of technology adoption in the Blackbelt Region by analyzing the patterns of videoconference use. An analysis of the impact of community norms, confidence in technology, and perceived usefulness on usage patterns will provide valuable insights for the creation of culturally sensitive strategies to promote digital technology in rural areas that have low socioeconomic status. This is crucial in formulating treatments that effectively connect with local communities and cater to their specific needs and preferences. Moreover, this research has the potential to enhance the wider discussion on rural digital inclusion by examining the results

obtained from the Blackbelt Region and comparing them to data from other rural locations in the United States and worldwide. Comparative investigations may uncover similarities and distinctions in the patterns of digital adoption, enhancing the worldwide comprehension of technology use in rural areas.

Limitations of the Study

It is essential to recognize the inherent limits of this dissertation, despite the rigorous approach adopted, since these constraints may impact the generalizability and interpretation of the results. Survey flyer distribution proved to be an obstacle in Macon County, Alabama. Although survey distribution sites had been pre-established in the community, and a substantial number of valuable responses were obtained, the snowball effect anticipated was not as effective as anticipated and which can usually be helpful when the demographic of interest is hard to reach (Berndt, 2020). During the survey distribution, these initial volunteers were invited to suggest more eligible people, and so on, but did not appear to occur in this research. In addition, frequent bad weather during survey distribution at food distribution sites in Macon County caused low turnout, which reduced the number of anticipated responses. Another limitation included participants with little to no digital literacy skills. For example, some individuals received flyers but could not access cell phones with QR-compatible capabilities or internet/computers to take the online survey. Finally, with Macon County being ground zero for the infamous Tuskegee Syphilis Study, there is still apprehension among community members about participating in any study of any kind (Freimuth et al., 2001). The combination of these limitations has made it challenging to conduct research in this region.

Recommendations for Future Research and Implications

There is a great need for research on videoconference systems and the dynamics that affect their use in the Blackbelt region. More research expanding all of Alabama's Blackbelt counties could present a more accurate study analysis on the demographic, social, and economic realities. Macon County represents only one area of the Blackbelt. Although all the Blackbelt counties across the US are considered low socioeconomic, they each present differences that could provide a more detailed and accurate analysis of the factors. The increase in research should include interactions among more variables such as demographics (race, age, income, etc.), computer self-efficacy, technology acceptance model constructs, technology type, and internet speed. Although this study recorded many of these variables, it was not the central focus of the study, and was not included in the analyses. Other descriptive data collected during this study but not used for analysis can provide some insight into the need for similar research. Descriptive data included videoconference devices used most often, videoconference systems used most often, gender, and race. Table 22 shows that "Smartphones" and "Laptops" were the most used videoconference technology devices, and "Tablets" were the least common among participants in this study.

Table 22

Videoconference Device Descriptive Data

	N	%
Tablet	102	38.49%
Smartphone	97	36.60%
Laptop	42	15.85%
Desktop	24	9.06%

For example, the videoconference system that was overwhelmingly used the most often among participants was “Zoom” (Table 23). Research might look at the features and cost of the platforms to understand usage and preferences.

Table 23

Videoconference System Descriptive Data

	N	%
Zoom	198	73.88
Google Meet	25	9.33
Microsoft Teams	18	6.72
Other	16	5.97
Cisco Webex	6	2.24
Skype	5	1.87

Most of the participants were “Female” and “African American” (Table 24 and Table 25). These results are possibly linked to Macon County being a true representation of Blackbelt demographics. However, it is difficult to make any assumptions as to why “Females” overwhelmingly participated compared to “Males.”

Table 24

Gender Descriptive Data

	N	%
Female	201	73.1%
Male	70	25.5%
Prefer not to say	4	1.5%

Table 25

Race Descriptive Data

	N	%
Black or African American	260	94.5%
White	10	3.6%
Other	5	1.8%

Other future research should also include survey data from youth or the family as it is common in Macon County and other Alabama Blackbelt counties to disseminate information through youth at school. Surveying youth could help better understand family dynamics and provide more precise observations of videoconference dynamics within the family or household. Conducting surveys among young individuals may enhance the depth of study on family dynamics and videoconference dynamics inside the family or home. This is achieved by providing distinct views, viewpoints, and experiences that complement those encountered by adults. Researchers may enhance their knowledge of family dynamics and customize treatments and support services to better cater to all family members' needs by considering all family members' viewpoints.

Another recommendation for future research is to study videoconference use among those with little to no literacy skills. This demographic is high within Alabama's Blackbelt and is often overlooked in studies. Allowing researchers to work with individuals to read and complete the study online may provide more responses. In addition, providing paper survey options for participants would help to eliminate digital dependency among those who do not have access to the computer or technology required for digital instruments.

The implications of videoconference systems research within the Blackbelt region have the potential to help significantly narrow the digital divide. Investigating videoconference systems in the Blackbelt region can yield significant findings and remedies for mitigating the digital divide. This can be achieved through the enhancement of technology accessibility, the improvement of digital literacy and skills, the consideration of cultural and community factors, the expansion of access to vital services, and the promotion of community empowerment and economic development. These endeavors have the potential to mitigate the digital gap and foster

more equity in possibilities for those living in underprivileged regions. This would help individuals and families in this region to take full advantage of available internet access. Campaigns tailored to make the community comfortable with videoconference technology could help increase its use. This would help provide more opportunities for telehealth, individuals' access to jobs, classes, schools, and training that require videoconference systems use.

Conclusion

This study documented characteristics associated with videoconference system use in Alabama's Blackbelt region. The rise in the use of videoconference systems since the Covid-19 pandemic began in 2019 has highlighted glaring digital divide inequities in low socioeconomic communities such as the Blackbelt region in Alabama. This study analyzed the relationship between computer self-efficacy and technology acceptance model constructs, age, and income. Results showed a significant relationship between CSE and age as well as income. It also observed that a significant relationship exists between CSE and several Technology Acceptance Model 2 (TAM2 constructs, including AU (actual use), ATT (attitude toward use), and PEOU (perceived ease of use). Extended research on the TAM2 continues to illuminate the nuanced dynamics underlying technology adoption and usage, providing valuable insights into the evolving landscape of user acceptance behaviors, technological innovations, and their implications across diverse domains, thus contributing significantly to the advancement of both theoretical frameworks and practical applications in the field of information systems and technology management. The implications of videoconference systems research within the Blackbelt region have the potential to help significantly narrow the digital divide and provide equity in lifelong learning.

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APPENDIX

Appendix 1. Demographics for Gender, Age, Race, Education Attained, Income, & Technology

To which gender identity do you most identify?
- Male
- Female
- Prefer Not to Answer

What is your age?

What is your race?
- White
- Black or African American
- American Indian or Alaskan Native
- Asian
- Native Hawaiian or Other

What is the highest level of education you have attained?
- Less than high school summer
- High school diploma or GED
- Bachelor's or Associate's College Degree
- Master's, Professional Degree, or beyond

What is your annual income before taxes?
- Below $24,000
- $24,000-$53,000
- $54,000-$100,000
- Above $100,000

What device do you use to access videoconference systems?
- Desktop
- Laptop
- Smart phone
- Tablet

Which videoconference platform do you use most often?
- Zoom
- Skype
- Google Meet
- Microsoft Teams
- Cisco Webex
- Other

Appendix 2. Computer Self-Efficacy Questions (adopted from Compeau & Higgins, 1995)

Computer Self-efficacy

CSE1: I could complete the required tasks using the videoconference system if there was no one around to tell me what to do as I go.

CSE2: I could complete the required tasks using the videoconference system if I had never used a 'learning tool' like it before.

CSE3: I could complete the required tasks using the videoconference system if I had only the 'learning tool' manuals for reference.

CSE4: I could complete the required tasks using the videoconference system if I had seen someone else using it before trying it myself.

CSE5: I could complete the required tasks using the videoconference system if I could call someone for help if I got stuck.

CSE6: I could complete the required tasks using the videoconference system if someone else had helped me get started.

CSE7: I could complete the required tasks using the videoconference system if I had a lot of time to complete the task for which the 'learning tool' was provided.

CSE8: I could complete the required tasks using the videoconference system if I had just the built-in help facility for assistance.

CSE9: I could complete the required tasks using the videoconference system if someone showed me how to do it first.

CSE10: I could complete the required tasks using the videoconference system if I had used a similar 'videoconference system' like this one before to do the task.

Appendix 3. Technology Acceptance Model 2 Construct Measurements
(Adapted from Venkatesh & Davis, 2000)

Actual use
AU1: I use the videoconference system sometimes.
AU2: I use the videoconference system on a daily basis.
AU3: I use the videoconference on rare occasions.

Attitude toward use
ATT1: I feel positive about using videoconference systems.
ATT2: I like using videoconference systems.
ATT3: The videoconference system provides a desirable learning environment.

Behavioral intention to use
BI1: I intend to make use of the content and functions of videoconference system for providing assistance to my academic activities.
BI2: I will give out my recommendation to others to use the videoconference system.
BI3: I will use the videoconference system on a regular basis in the future.

Perceived enjoyment
PE1: Using the videoconference system is fun.
PE2: My imagination is sparked by using the videoconference system.
PE3: The use of the videoconference system triggers my curiosity.

Perceived ease of use
PEOU1: There is clarity and understanding in my interaction with the videoconference system.
PEOU2: The videoconference system is easy to use for me.
PEOU3: Using the videoconference system does not require a lot of my mental effort.

Perceived usefulness
PU1: The videoconference system increases my learning performance.
PU2: Using the videoconference system increases my learning effectiveness.
PU3: I find the videoconference system to be useful in my learning.

Subjective norm
SN1: I should participate in the videoconference activities, according to others.
SN2: I should make use of the videoconference system, as per the people whose opinions I consider worthy.
SN3: My friends think that I should use the videoconference system.

Revised 10/18/2022

AUBURN UNIVERSITY HUMAN RESEARCH PROTECTION PROGRAM (HRPP)

EXEMPT REVIEW APPLICATION

For assistance, contact: **The Office of Research Compliance (ORC)**
Phone: **334-844-5966** E-Mail: **IRBAdmin@auburn.edu** Web Address: **http://www.auburn.edu/research/vpr/ohs**
Submit completed form and supporting materials as one PDF through the IRB Submission Page
Hand written forms are not accepted. Where links are found hold down the control button (Ctrl) then click the link..

1. Project Identification **Today's Date: May 29, 2023**

Anticipated start date of the project: June 1, 2023 Anticipated duration of project: 1 Year

a. Project Title: Videoconference Use Predictors and Dynamics in Alabama's Black Belt Region

b. Principal Investigator (PI): Daniel McKinley Sullen Degree(s): Doctorate
Rank/Title: Graduate Student Department/School: Educational Foundations, Leadership, and Technology
Role/responsibilities in this project: Design research; collect, process, and analyze data; write papers / present research findings; responsible for survey participants recruitment efforts; answer questions posted by participants during the survey distribution process.
Preferred Phone Number: 3342671801 AU Email: dms0010@auburn.edu

Faculty Advisor Principal Investigator (if applicable): Leslie Cordie
Rank/Title: Associate Professor Department/School: Educational Foundations, Leadership, and Technology
Role/responsibilities in this project: faculty advisor
Preferred Phone Number: 3348443089 AU Email: lesliecordie@auburn.edu

Department Head: William Murrah Department/School: Educational Foundations, Leadership, and Technology
Preferred Phone Number: 3348443806 AU Email: wmm0017@auburn.edu
Role/responsibilities in this project: N/A

c. Project Key Personnel – Identify all key personnel who will be involved with the conduct of the research and describe their role in the project. Role may include design, recruitment, consent process, data collection, data analysis, and reporting. (To determine key personnel, see decision tree**).** *Exempt determinations are made by individual institutions; reliance on other institutions for exempt determination is not feasible. Non-AU personnel conducting exempt research activities must obtain approval from the IRB at their home institution.*

Key personnel are required to maintain human subjects training through CITI. Only for EXEMPT level research is documentation of completed CITI training NO LONGER REQUIRED to be included in the submission packet. NOTE however, **the IRB will perform random audits of CITI training records to confirm** reported training courses and expiration dates. Course title and expiration dates are shown on training certificates.

Name: Daniel McKinley Sullen Degree(s): M.S.
Rank/Title: Graduate Student Department/School: Educational Foundations, Leadership, and Technology
Role/responsibilities in this project: Design research; collect, process, and analyze data; write papers / present research findings; responsible for survey participants recruitment efforts; answer questions posted by participants during the survey distribution process.
- AU affiliated? ☒ Yes ☐ No If no, name of home institution: Click or tap here to enter text.
- Plan for IRB approval for non-AU affiliated personnel? Click or tap here to enter text.
- Do you have any known competing financial interests, personal relationships, or other interests that could have influence or appear to have influence on the work conducted in this project? ☐ Yes ☒ No

Revised 10/18/2022

- If yes, briefly describe the potential or real conflict of interest: Click or tap here to enter text.
- Completed required CITI training? ☒ Yes ☐ No If NO, complete the appropriate CITI basic course and update the revised Exempt Application form.
- If YES, choose course(s) the researcher has completed:

AU Basic RCR Training for ALL Faculty, Staff, Postdocs, and Students	5/2/2026
Social, Behavioral and Education Sciences RCR	5/2/2028
Conflicts of Interest in Research Involving Human Subjects	5/2/2026
Internet Research BSE	5/23/2026

Name: Leslie Cordie Degree(s): PhD

Rank/Title: Associate Professor Department/School: Educational Foundations, Leadership, and Technology

Role/responsibilities in this project: : **faculty advisor, responsibility of research oversight**.

- AU affiliated? ☒ Yes ☐ No If no, name of home institution: Click or tap here to enter text.
- Plan for IRB approval for non-AU affiliated personnel? Click or tap here to enter text.
- Do you have any known competing financial interests, personal relationships, or other interests that could have influence or appear to have influence on the work conducted in this project? ☐ Yes ☒ No
- If yes, briefly describe the potential or real conflict of interest: Click or tap here to enter text.
- Completed required CITI training? ☒ Yes ☐ No If NO, complete the appropriate CITI basic course and update the revised EXEMPT application form.
- If YES, choose course(s) the researcher has completed:

Internet Research	1/7/2024
Social, Behavioral and Education Science	1/7/2024
AU Basic RCR Training for All Faculty, Staff, Postdocs, and Students	8/29/2024

Name: Chih-hsuan Wang Degree(s): PhD

Rank/Title: Professor Department/School: Educational Foundations, Leadership, and Technology

Role/responsibilities in this project: Guide in the use of methodologies to analyze data and interprets data from other studies and population-based study databases. Also guides in the designs, plans and execution of the research project.

- AU affiliated? ☒ Yes ☐ No If no, name of home institution: Click or tap here to enter text.
- Plan for IRB approval for non-AU affiliated personnel? Click or tap here to enter text.
- Do you have any known competing financial interests, personal relationships, or other interests that could have influence or appear to have influence on the work conducted in this project? ☐ Yes ☒ No
- If yes, briefly describe the potential or real conflict of interest: Click or tap here to enter text.
- Completed required CITI training? ☒ Yes ☐ No If NO, complete the appropriate CITI basic course and update the revised EXEMPT application form.
- If YES, choose course(s) the researcher has completed:

IRB #1 Health Science Emphasis - AU Personnel	6/8/2025
IRB # 2 Social and Behavioral Emphasis - AU Personnel	11/27/2024
Responsible Conduct of Research for Social and Behavioral	9/9/2024
Responsible Conduct of Research for Humanities RCR	9/9/2024
CITI Conflicts of Interest Conflicts of Interest	6/1/2024
Defining Research with Human Subjects – SBE	6/8/2025
Responsible Conduct of Research	2/1/2026
Good Clinical Practice (U.S. FDA Focus)	9/20/2025

d. Funding Source – Is this project funded by the investigator(s)? Yes ☐ No ☒

Is this project funded by AU? Yes ☐ No ☒ If YES, identify source Click or tap here to enter text.

Is this project funded by an external sponsor? Yes ☐ No ☒ If YES, provide name of sponsor, type of sponsor

(governmental, non-profit, corporate, other), and an identification number for the award.
Name: Click or tap here to enter text. Type: Click or tap here to enter text. Grant #: Click or tap here to enter text.

e. List other AU IRB-approved research projects and/or IRB approvals from other institutions that are associated with this project. Describe the association between this project and the listed project(s):
Click or tap here to enter text.

2. Project Summary

a. Does the study *TARGET* any special populations? Answer YES or NO to all.

Minors (under 18 years of age; if minor participants, at least 2 adults must be present during all research procedures that include the minors)	Yes ☐ No ☒
Auburn University Students	Yes ☐ No ☒
Pregnant women, fetuses, or any products of conception	Yes ☐ No ☒
Prisoners or wards (unless incidental, not allowed for Exempt research)	Yes ☐ No ☒
Temporarily or permanently impaired	Yes ☐ No ☒

b. Does the research pose more than minimal risk to participants? Yes ☐ No ☒

If YES, to question 2.b, then the research activity is NOT eligible for EXEMPT review. Minimal risk means that the probability and magnitude of harm or discomfort anticipated in the research is not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or test. 42 CFR 46.102(i)

c. Does the study involve any of the following? *If YES to any of the questions in item 2.c, then the research activity is NOT eligible for EXEMPT review.*

Procedures subject to FDA regulations (drugs, devices, etc.)	Yes ☐ No ☒
Use of school records of identifiable students or information from instructors about specific students.	Yes ☐ No ☒
Protected health or medical information when there is a direct or indirect link which could identify the participant.	Yes ☐ No ☒
Collection of sensitive aspects of the participant's own behavior, such as illegal conduct, drug use, sexual behavior or alcohol use.	Yes ☐ No ☒

d. Does the study include deception? Requires limited review by the IRB* Yes ☐ No ☒

3. MARK the category or categories below that describe the proposed research. Note the IRB Reviewer will make the final determination of the eligible category or categories.

☐ **1.** Research conducted in established or commonly accepted educational settings, involving normal educational practices. The research is not likely to adversely impact students' opportunity to learn or assessment of educators providing instruction. 104(d)(1)

☒ **2.** Research only includes interactions involving educational tests, surveys, interviews, public observation if at least ONE of the following criteria. (The research includes data collection only; may include visual or auditory recording; may NOT include intervention and only includes interactions). **Mark the applicable sub-category below (I, ii, or iii). 104(d)(2)**

☒ **(i)** Recorded information cannot readily identify the participant (directly or indirectly/ linked);

OR

- surveys and interviews: no children;
- educational tests or observation of public behavior: can only include children when investigators do not participate in activities being observed.

☐ **(ii)** Any disclosures of responses outside would not reasonably place participant at risk; **OR**

☐ **(iii)** Information is recorded with identifiers or code linked to identifiers and IRB conducts limited review; no children. **Requires limited review by the IRB.***

☐ **3.** Research involving Benign Behavioral Interventions (BBI)** through verbal, written responses including data entry or audiovisual recording from adult subjects who prospectively agree and ONE of the following criteria is met. (This research does not include children and does not include medical interventions. Research cannot have deception unless the participant prospectively agrees that they will be unaware of or misled regarding the nature and purpose of the research) **Mark the applicable sub-category below (A, B, or C).** 104(d)(3)(i)

☐ **(A)** Recorded information cannot readily identify the subject (directly or indirectly/ linked); **OR**

☐ **(B)** Any disclosure of responses outside of the research would not reasonably place subject at risk; **OR**

☐ **(C)** Information is recorded with identifies and cannot have deception unless participants prospectively agree. **Requires limited review by the IRB.***

☐ **4.** Secondary research for which consent is not required: use of identifiable information or identifiable bio-specimen that have been or will be collected for some other 'primary' or 'initial' activity, if one of the following criteria is met. Allows retrospective and prospective secondary use. **Mark the applicable sub-category below (i, ii, iii, or iv).** 104 (d)(4)

☐ **(i)** Bio-specimens or information are publicly available;

☐ **(ii)** Information recorded so subject cannot readily be identified, directly or indirectly/linked investigator does not contact subjects and will not re-identify the subjects; **OR**

☐ **(iii)** Collection and analysis involving investigators use of identifiable health information when us is regulated by HIPAA "health care operations" or "research" or "public health activities and purposes" (does not include bio-specimens (only PHI and requires federal guidance on how to apply); **OR**

☐ **(iv)** Research information collected by or on behalf of federal government using government generated or collected information obtained for non-research activities.

☐ **5.** Research and demonstration projects which are supported by a federal agency/department AND designed to study and which are designed to study, evaluate, or otherwise examine: (i)public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or service under those programs. (must be posted on a federal web site). 104.5(d)(5) (must be posted on a federal web site)

☐ **6.** Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives and consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe,

by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture. The research does not involve prisoners as participants. 104(d)(6)

***Limited IRB review – the IRB Chair or designated IRB reviewer reviews the protocol to ensure adequate provisions are in place to protect privacy and confidentiality.*

***Category 3 – Benign Behavioral Interventions (BBI) must be brief in duration, painless/harmless, not physically invasive, not likely to have a significant adverse lasting impact on participants, and it is unlikely participants will find the interventions offensive or embarrassing.*

**** Exemption categories 7 and 8 require broad consent. The AU IRB has determined the regulatory requirements for legally effective broad consent are not feasible within the current institutional infrastructure. EXEMPT categories 7 and 8 will not be implemented at this time.*

4. Describe the proposed research including who does what, when, where, how, and for how long, etc.

a. Purpose

The aim of this study is to analyze factors that can predict videoconference platform use in low socioeconomic rural (LSRs) populations. In addition, the study seeks to investigate how relationships among an individual's age or income influence the constructs.

b. Participant population, including the number of participants and the rationale for determining number of participants to recruit and enroll. Note if the study enrolls minor participants, describe the process to ensure more than 1 adult is present during all research procedures which include the minor.

The target population in this study will include individuals who reside in Macon County, Alabama which is in the Black Belt Region of the US. Convenience sampling will be used with a community partner who works with the area and provides regular food distribution across the county. This partner has regular days and sites (7) that provide food distribution throughout the county and thus has potential access to reach a broad portion of the sample population. Each site receives approximately 50 or more participants at the site during the month. To receive the food distribution, the community partner checks for residency. This study will be expecting at least 300 survey responses to ensure a sufficient response rate. Only adults will be asked to participate (those over 19 in the state of Alabama).

c. Recruitment process. Address whether recruitment includes communications/interactions between study staff and potential participants either in person or online. *Submit a copy of all recruitment materials.*

The researcher has obtained approval to distribute the survey at the food distribution sites with the Director (see attached letter). There is a monthly Zoom meeting held by the community partner director that discusses distribution efforts with the site coordinators. At this meeting, the researcher will discuss the intended survey and share the recruitment flyer (see attached) with the site coordinators before recruitment at the food sites to ensure transparency. The actual recruitment process by the researcher involves meeting potential participants at each of the five (5) feeding sites while they are in line waiting to get their food distribution. The researcher will distribute flyers to those waiting in their cars and ask them to consider participation if they are 19 or older. They will be encouraged to ask adult family members and neighbors (those with Macon County residency) to participate, thus using a snowball effect to increase survey responses.

d. Consent process including how information is presented to participants, etc.

Macon County residents who agree to participate will be given a flyer that has a QR code which will allow them access to compete the survey on their cell phone or mobile device. In addition, a link will be provided on the flyer to complete the survey online from any web browser on a desktop or laptop.

e. Research procedures and methodology

The survey in this study (see attached) is available via Auburn University Qualtrics. Qualtrics is a web-based

survey software provided by Auburn University and provides a safe and secure uniform survey distribution data collection platform. The recruitment flyer (see attached) will have a QR code to provide access to the survey. Many smartphone and mobile devices have camera apps that will connect the QR code directly to the survey. In addition, a link for the survey will also be printed on the flyer so that participants can type the information into a web browser. Potential participants will be instructed to only participate one time on the flyer. Data will be analyzed using Statistical Product and Service Solutions (SPSS) software. The research questions for this study will be analyzed using both ANOVA and linear regression analysis to explore the data for findings.

f. Anticipated time per study exercise/activity and total time if participants complete all study activities.
The anticipated time for the completion of the survey is approximately 5 to 10 minutes one the participant reads the informed consent online and decides to participate in the survey.

g. Location of the research activities.
The location for research activities includes the Macon County Feeding Sites: 5 community feeding sites throughout Macon County.

h. Costs to and compensation for participants? If participants will be compensated describe the amount, type, and process to distribute.
There will be no costs or compensation for participants.

i. Non-AU locations, site, institutions. *Submit a copy of agreements/IRB approvals.*
See attached letter from community partner director.

j. Describe how results of this study will be used (presentation? publication? thesis? dissertation?)
These results of this study will be used for the completion of a dissertation. This work will also be presented at subject related conferences and may be published in peer reviewed journals.

k. Additional relevant information.

5. Waivers
Check applicable waivers and describe how the project meets the criteria for the waiver.

☐ Waiver of Consent (Including existing de-identified data)

☒ Waiver of Documentation of Consent (Use of Information Letter, rather than consent form requiring signatures)

☐ Waiver of Parental Permission (in Alabama, 18 years-olds may be considered adults for research purposes)
https://sites.auburn.edu/admin/orc/irb/IRB 1 Exempt and Expedited/11-113 MR 1104 Hinton Renewal 2021-1.pdf

a. Provide the rationale for the waiver request.
Participants' age in this study is greater or equal to 19-years-old. This study will also record no personal information of participants in which they could be contacted in the future. This study also involves no personal or physical risk to participants.

6. Describe the process to select participants/data/specimens. If applicable, include gender, race, and ethnicity of the participant population.

The community survey distribution partner was chosen due to each feeding site having regular access to residents of different demographics and the ability to reach a broad portion of the population throughout Macon County. These demographics age 19 and older, and include Senior citizens, parents, young adults, and everyone surrounding the feeding sites**.**

7. Risks and Benefits

7a. Risks - Describe why none of the research procedures would cause a participant either physical or psychological discomfort or be perceived as discomfort above and beyond what the person would experience in daily life (minimal risk).

Due to the face-to-face nature of providing the food, the feeding sites have established protocols to prevent exposure to COVID-19 and other diseases. Thus, the researcher will follow the protocols that have been established using them to minimize the risk of infection, including but not limited to, social distancing, and personal protective equipment (PPE) usage. If needed, the researcher and site coordinator will provide potential participants with PPE before handing them the recruitment flyer. We acknowledge the potential risks associated with this study and will ensure that all necessary precautions are taken to protect the health and safety of the participants and researchers involved**.** Besides the risk of exposure to COVID-10 and other viruses**, s**urvey questions are expected to cause no mental or physical harm to participants. The participants will not be contacted following the study and their identity will remain unknown. Participants could potentially take the survey in a more secure or private location if they desire.

7b. Benefits – Describe whether participants will benefit directly from participating in the study. If yes, describe the benefit. And, describe generalizable benefits resulting from the study.

There will be no direct benefit of participants involvement in this study. However, there may be potential benefits in terms of learning about factors that affect digital engagement in low socio-economic communities and access to videoconference platforms. This information could assist in designing more effective ways of connecting to these communities for a variety of opportunities, including learning.

8. Describe the provisions to maintain confidentiality of data, including collection, transmission, and storage. Identify platforms used to collect and store study data. *For EXEMPT research, the AU IRB recommends AU BOX or using an AU issued and encrypted device. If a data collection form will be used, submit a copy.*

The survey (see attached) will ask no questions that will risk exposing the participants identity in any way. All data collected through Auburn University Qualtrics will be stored on Auburn University's computers and AU Online Storage Box, both of which require a two-step authentication for access. After research is completed, all data will be permanently deleted after 3 years.

a. If applicable, submit a copy of the data management plan or data use agreement.

Revised 10/18/2022

9. Describe the provisions included in the research to protect the privacy interests of participants (e.g., others will not overhear conversations with potential participants, individuals will not be publicly identified or embarrassed).

Participants can complete this survey in private and by themselves in a safe location and using their own technology. The identity of the participants in the study will be not be recorded.

10. Does this research include purchase(s) that involve technology hardware, software or online services?

☐ **YES** ☒ **NO**

If YES:

A. Provide the name of the product Click or tap here to enter text.
and the manufacturer of the product Click or tap here to enter text.

B. Briefly describe use of the product in the proposed human subject's research.
Click or tap here to enter text.

C. To ensure compliance with AU's Electronic and Information Technology Accessibility Policy, contact AU IT Vendor Vetting team at vetting@auburn.edu to learn the vendor registration process (prior to completing the purchase).

D. Include a copy of the documentation of the approval from AU Vetting with the revised submission.

11. Additional Information and/or attachments.

In the space below, provide any additional information you believe may help the IRB review of the proposed research. If attachments are included, list the attachments below. Attachments may include recruitment materials, consent documents, site permissions, IRB approvals from other institutions, data use agreements, data collection form, CITI training documentation, etc.

Daniel McKinleySullen is a Ph.D. student in the Department of Educational Foundations, Leadership, and Technology. This research will be conducted under the direction of Dr. Leslie Cordie, with data analysis assistance provided by Dr. Wang of EFLT as the methodologist. List of attachments: community partner director letter, recruitment flyer, information letter, and survey.

Required Signatures *(If a student PI is identified in item 1.a, the EXEMPT application must be re-signed and updated at every revision by the student PI and faculty advisor. The signature of the department head is required only on the initial submission of the EXEMPT application, regardless of PI. Staff and faculty PI submissions require the PI signature on all version, the department head signature on the original submission)*

Signature of Principal Investigator: Daniel McKinleySullen **Date:** 05/29/2023

Signature of Faculty Advisor (If applicable): Leslie Cordie **Date:** 5/31/2023

Signature of Dept. Head: William Murrah **Date:** 06/01/2023

Version Date: 05/29/2023

AUBURN UNIVERSITY

COLLEGE OF EDUCATION

EDUCATIONAL FOUNDATIONS, LEADERSHIP AND TECHNOLOGY

Videoconference Use Study

Be part of an important study and research about videoconference systems

Are you at least 19 years of age?

Do you live in Macon County, Alabama and have used a videoconference platform such as Zoom, Google Meets, Skype, etc.?

If you answered ***YES*** to these questions, you may be eligible to participate in a videoconference use research study!

This research study is being conducted by the Department of Educational Foundations, Leadership, and Technology at Auburn University.

Adults ages 19 and older residing in Macon County, Alabama are eligible to participate only ONCE (1 time). There is no benefit or compensation to participate in the study.

Scan the QR Code to access the survey or go to the link:

Please contact Mr. Daniel Sullen at **dms0010@auburn.edu** or **334-267-1801** for more information.

Version Date: 05/22/2023

The Auburn University Institutional Review Board has approved this Document for use from 06/09/2023 to ----------
Protocol # 23-290 EX 2306

4036 Haley Center, Auburn, AL 36849-5221; Telephone: 334-844-4460: Fax: 334-844-3072

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(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMATION LETTER

for a Research Study entitled

" Videoconference Use Predictors and Dynamics in Alabama's Black Belt Region"

You are invited to participate in a research study to analyze factors that can predict videoconference platforms engagement in low socioeconomic rural populations. The study is being conducted by Mr. Daniel Sullen (PhD Candidate), under the direction of Dr. Leslie Cordie in the Auburn University Department of Education. You are invited to participate because you are a resident of Macon County, Alabama and are age 19 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete a survey using the QR code provided on the flyer. Your total time commitment will be approximately 5 minutes.

Are there any risks or discomforts? There are no risks associated with participating in this study.

Are there any benefits to yourself or others? If you participate in this study, you can expect to assist research to provide insight into variables affecting adults' use of videoconference platforms in Macon County. We/I cannot promise you that you will receive any or all of the benefits described.

Will you receive compensation for participating? There will be no compensation provided for participating.

Are there any costs? If you decide to participate, there are no direct cost associated with this study. Auburn University has not provided for any payment if you are harmed as a result of participating in this study.

Version Date: 05/02/2023

The Auburn University Institutional Review Board has approved this Document for use from 06/09/2023 to ----------
Protocol # 23-290 EX 2306

4036 Haley Center, Auburn, AL 36849-5221; Telephone: 334-844-4460: Fax: 334-844-3072

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If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Education or Department of Educational Foundations, Leadership and Technology.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by storing data securely on Auburn University's computer which requires two step authentication for access. Information collected through your participation may be (e.g., used to fulfill an educational requirement, published in a professional journal, and/or presented at a professional meeting, etc.)

If you have questions about this study, please ask them now or contact Mr. Daniel Sullen at dms0010@auburn.edu or Dr. Leslie Cordie at lak0007@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334)-844-5966 or e-mail at IRBadmin@auburn.edu or IRBChair@auburn.edu.

Version Date: 05/02/2023

The Auburn University Institutional Review Board has approved this Document for use from 06/09/2023 to ----------
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HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

Daniel Sullen

Investigator's signature Date 05/29/2023

Daniel Sullen

The Auburn University Institutional Review Board has approved this Document for use from 06/09/2023 to ----------
Protocol # 23-290 EX 2306

Version Date: 05/02/2023

Click here to consent and take survey.

4036 Haley Center, Auburn, AL 36849-5221; Telephone: 334-844-4460: Fax: 334-844-3072

www.auburn.edu

Videoconference Use Predictors and Dynamics in Alabama's Black Belt Region

Q1 To which gender identity do you most identify?

- ○ Male (1)
- ○ Female (2)
- ○ Prefer not to say (3)

Q2 What is your age?

_____

Q3 What is your race?

- ○ White (1)
- ○ Black or African American (2)
- ○ American Indian or Alaskan Native (3)
- ○ Asian (4)
- ○ Native Hawaiian or Pacific Islander (5)
- ○ Other (6)

Q4 What is the highest level of education you have attained?

- Less than a high school diploma (1)
- High school diploma or GED (2)
- Bachelor's or Associate's Degree (3)
- Master's / Professional Degree or beyond (4)

Q5 What is your annual yearly income before taxes?

- Under $25,000 (5)
- $25,000 - $49,999 (6)
- $50,000 - $74,999 (7)
- $75,000 - $99,999 (8)
- $100,000 - $124,999 (9)
- $125,000 - $149.999 (10)
- $150,000 and Higher (11)

Q6 What device do you use to access videoconference systems?

- Desktop (1)
- Laptop (2)
- Smart Phone (3)
- Tablet (4)

Q38 Which videoconference platform do you use most often?

- ○ Zoom (1)
- ○ Skype (2)
- ○ Google Meet (3)
- ○ Microsoft Teams (4)
- ○ Cisco Webex (5)
- ○ Other (6)

Q7 I could complete the required tasks using videoconferencing if there was no one around to tell me what to do as I go.

- ○ Strongly Disagree (1)
- ○ Moderately Disagree (2)
- ○ Somewhat Disagree (3)
- ○ Neither Disagree or Agree (4)
- ○ Somewhat Agree (5)
- ○ Moderately Agree (6)
- ○ Strongly Agree (7)

Q9 I could complete the required tasks using the videoconferencing if I had never used a 'learning tool' like it before

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q11 I could complete the required tasks using the videoconferencing if I had only the 'learning tool' manuals for reference.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q12 I could complete the required tasks using the videoconferencing if I had seen someone else using it before trying it myself.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q13 I could complete the required tasks using the videoconferencing if I could call someone for help if I got stuck

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q14 I could complete the required tasks using the videoconferencing if someone else had helped me get started

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q15 I could complete the required tasks using the videoconferencing if I had a lot of time to complete the task for which the ‘learning tool’ was provided.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q16 I could complete the required tasks using the videoconferencing f I had just the built-in help facility for assistance.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q17 I could complete the required tasks using the videoconferencing if someone showed me how to do it first.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q18 I could complete the required tasks using the videoconferencing if I had used similar ‘video conferencing’ like this one before to do the task.

- ○ Strongly Disagree (1)
- ○ Moderately Disagree (2)
- ○ Somewhat Disagree (3)
- ○ Neither Disagree or Agree (4)
- ○ Somewhat Agree (5)
- ○ Moderately Agree (6)
- ○ Strongly Agree (7)

Q30 I use the videoconference system sometimes.

- ○ Strongly Disagree (1)
- ○ Moderately Disagree (2)
- ○ Somewhat Disagree (3)
- ○ Neither Disagree or Agree (4)
- ○ Somewhat Agree (5)
- ○ Moderately Agree (6)
- ○ Strongly Agree (7)

Q29 I use the videoconference on a daily basis.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q28 I use the videoconference on rare occasions

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q27 I feel positive about using videoconference systems.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q26 I like using videoconference systems

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q25 The videoconference system provides a desirable learning environment

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q24 I intend to make use of the content and functions of videoconference system for providing assistance to my academic activities.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q23 I will give out my recommendation to others to use the videoconference system

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q22 I will use the videoconference system on a regular basis in the future.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q21 Using the videoconference system is fun.

- ○ Strongly Disagree (1)
- ○ Moderately Disagree (2)
- ○ Somewhat Disagree (3)
- ○ Neither Disagree or Agree (4)
- ○ Somewhat Agree (5)
- ○ Moderately Agree (6)
- ○ Strongly Agree (7)

Q20 My imagination is sparked by using the videoconference system.

- ○ Strongly Disagree (1)
- ○ Moderately Disagree (2)
- ○ Somewhat Disagree (3)
- ○ Neither Disagree or Agree (4)
- ○ Somewhat Agree (5)
- ○ Moderately Agree (6)
- ○ Strongly Agree (7)

Q19 The use of the videoconference system triggers my curiosity.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q39 There is clarity and understanding in my interaction with the videoconference system.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q38 The videoconference system is easy to use for me.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q37 Using the videoconference system does not require a lot of my mental effort.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q36 The videoconference system increases my learning performance.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q35 Using the videoconference system increases my learning effectiveness.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q34 I find the videoconference system to be useful in my learning

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q33 I should participate in the videoconference activities, according to others.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q32 I should make use of the videoconference system, as per the people whose opinions I consider worthy.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

Q31 My friends think that I should use the videoconference system.

- Strongly Disagree (1)
- Moderately Disagree (2)
- Somewhat Disagree (3)
- Neither Disagree or Agree (4)
- Somewhat Agree (5)
- Moderately Agree (6)
- Strongly Agree (7)

End of Block: Default Question Block

CITI PROGRAM

Completion Date 02-May-2023
Expiration Date 02-May-2026
Record ID 50319440

This is to certify that:

Daniel Sullen

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Responsible Conduct of Research
(Curriculum Group)
AU Basic RCR Training for ALL Faculty, Staff, Postdocs, and Students
(Course Learner Group)
1 - RCR
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?wac0c3191-62b1-41c7-96c0-11387edd6066-50319440

CITI PROGRAM

Completion Date 02-May-2023
Expiration Date 02-May-2028
Record ID 55568541

This is to certify that:

Daniel Sullen

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Responsible Conduct of Research for Social and Behavioral
(Curriculum Group)
Social, Behavioral and Education Sciences RCR
(Course Learner Group)
2 - RCR Refresher
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?w27f0de2c-8309-4554-8d29-c60d507129fa-55568541

CITI PROGRAM

Completion Date 02-May-2023
Expiration Date 02-May-2026
Record ID 27956483

This is to certify that:

Daniel Sullen

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

IRB Additional Modules
(Curriculum Group)
Conflicts of Interest in Research Involving Human Subjects
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?w8ee0565f-9a66-44c4-8873-e16785f52c0a-27956483

CITI PROGRAM

Completion Date 23-May-2023
Expiration Date 23-May-2026
Record ID 56064619

This is to certify that:

Daniel Sullen

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

IRB Additional Modules
(Curriculum Group)
Internet Research - SBE
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?wbddff141-87a4-4025-b082-748b61381027-56064619

CITI PROGRAM

Completion Date 07-Jan-2021
Expiration Date 07-Jan-2024
Record ID 38525694

This is to certify that:

Leslie Cordie

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

IRB Additional Modules
(Curriculum Group)
Internet Research - SBE
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?w2a1ad32d-f33b-4eaf-b147-262ef87d6c48-38525694

CITI PROGRAM

Completion Date 07-Jan-2021
Expiration Date 07-Jan-2024
Record ID 38525693

This is to certify that:

Leslie Cordie

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

IRB Additional Modules
(Curriculum Group)
Social, Behavioral and Education Sciences
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?wb2a540ca-977c-4c78-8aab-5103415cef37-38525693

CITI PROGRAM

Completion Date 30-Aug-2022
Expiration Date 29-Aug-2025
Record ID 50995581

This is to certify that:

Leslie Cordie

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Responsible Conduct of Research
(Curriculum Group)
AU Basic RCR Training for ALL Faculty, Staff, Postdocs, and Students
(Course Learner Group)
1 - RCR
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?w13c02594-4e1e-491e-b3e4-848b3a4906fa-50995581

CITI PROGRAM

Completion Date 09-Jun-2022
Expiration Date 08-Jun-2025
Record ID 47899958

This is to certify that:

Chih-hsuan Wang

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

IRB #1 Health Science Emphasis - AU Personnel - Basic/Refresher
(Curriculum Group)
IRB #1 Health Science Emphasis - AU Personnel
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w8a351a57-509c-4993-a1d8-f863a161015b-47899958

CITI PROGRAM

Completion Date 28-Nov-2021
Expiration Date 27-Nov-2024
Record ID 44267147

This is to certify that:

Chih-hsuan Wang

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

IRB # 2 Social and Behavioral Emphasis - AU Personnel - Basic/Refresher
(Curriculum Group)
IRB # 2 Social and Behavioral Emphasis - AU Personnel
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w20ef423a-9896-463e-a1a3-548a8e00bbd8-44267147

CITI PROGRAM

Completion Date 11-Sep-2019
Expiration Date 09-Sep-2024
Record ID 28921387

This is to certify that:

Chih-hsuan Wang

Has completed the following CITI Program course:

Responsible Conduct of Research for Social and Behavioral
(Curriculum Group)

Social, Behavioral and Education Sciences RCR
(Course Learner Group)

2 - RCR Refresher
(Stage)

Not valid for renewal of certification through CME. Do not use for TransCelerate mutual recognition (see Completion Report).

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w61da7aab-d0c2-4768-b116-2cff50a16e90-28921387

CITI PROGRAM

Completion Date 11-Sep-2019
Expiration Date 09-Sep-2024
Record ID 28921388

This is to certify that:

Chih-hsuan Wang

Has completed the following CITI Program course:

Not valid for renewal of certification through CME. Do not use for TransCelerate mutual recognition (see Completion Report).

Responsible Conduct of Research for Humanities (Curriculum Group)
Humanities RCR (Course Learner Group)
2 - RCR Refresher (Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?we3773def-5604-4aa1-8742-ac85f2c0434d-28921388

CITI PROGRAM

Completion Date 02-Jun-2020
Expiration Date 01-Jun-2024
Record ID 35893637

This is to certify that:

Chih-hsuan Wang

Has completed the following CITI Program course:

Not valid for renewal of certification through CME. Do not use for TransCelerate mutual recognition (see Completion Report).

CITI Conflicts of Interest (Curriculum Group)
Conflicts of Interest (Course Learner Group)
2 - Refresher (Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w8150ecd8-93f1-4868-8871-5a70c45cac71-35893637

CITI PROGRAM

Completion Date 09-Jun-2022
Expiration Date 08-Jun-2025
Record ID 47899959

This is to certify that:

Chih-hsuan Wang

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

IRB Additional Modules
(Curriculum Group)
Defining Research with Human Subjects - SBE
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wa6da2789-6dea-4436-8e8d-d93171eb67b5-47899959

CITI PROGRAM

Completion Date 01-Feb-2023
Expiration Date 01-Feb-2026
Record ID 50319541

This is to certify that:

Chih-hsuan Wang

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Responsible Conduct of Research
(Curriculum Group)
AU Basic RCR Training for ALL Faculty, Staff, Postdocs, and Students
(Course Learner Group)
1 - RCR
(Stage)

Under requirements set by:

Auburn University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w50903fd9-aff1-4c4f-a12b-418fdf66e9c3-50319541

CITI PROGRAM

Completion Date 21-Sep-2022
Expiration Date 20-Sep-2025
Record ID 51604567

This is to certify that:

Chih-hsuan Wang

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Good Clinical Practice (U.S. FDA Focus)
(Curriculum Group)
GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus)
(Course Learner Group)
1 - GCP
(Stage)

Under requirements set by:

Auburn University

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Collaborative Institutional Training Initiative

This GCP training contains all of the attested CITI Program modules from the **GCP for Clinical Trials with Investigational Drugs and Medical Devices (U.S. FDA Focus) Version 2**. This ICH E6 GCP Investigator Site Training meets the Minimum Criteria for ICH GCP Investigator Site Personnel Training identified by TransCelerate BioPharma as necessary to enable mutual recognition of GCP training among trial sponsors.

Verify at www.citiprogram.org/verify/?we2181c77-1710-43f1-b6f8-43276ac78fe7-51604567