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Students' Perceptions of the Use of Technology in Rural Elementary Schools

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Rapid technological advancements have transformed educational experiences, optimizing learning outcomes while providing interesting experiences to learners and educators. More insight was needed on how students perceive learning via technology, as this information can shape how teachers implement technology, especially in rural elementary schools. The main purpose of this research was to investigate the perceptions of students in rural areas between Grades 1–5 regarding the increased use of technology education. The research questions concerned how students in rural elementary schools perceive (a) the use of technology in education and (b) the quality of the teaching–learning process when using or mediating technological resources. The stakeholder theory served as the conceptual framework and demonstrated the importance of engaging learners and other professionals in decision making. As part of the qualitative approach, semi-structured interviews were conducted with 10 rural elementary students on the use of technology in educational settings. Thematic analysis yielded themes pertaining to consultation (where participants were able to ask their teachers for help but received less help from their parents), learning speed (where technology increased their speed of learning), and impacts of technology on learning (where their enjoyment with technology varied, but games increased their level of fun). The results inform positive social change on best strategies for incorporating technology into learning settings and enhancing students' engagement levels in that future efforts must be codesigned with students, not imposed upon them.

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Chapter 1: Introduction to the Study

In this study, I explored students' perceptions in rural areas regarding the increased use of technology in education. Technological devices have proliferated into rural areas, making them convenient in the teaching and learning process. When selecting appropriate educational technologies for rural areas, accessibility and affordability are crucial considerations. Ahiaku et al. (2025) emphasize that these factors directly address challenges such as high costs, limited device availability, and the physical accessibility of tools. In addition, Mustafa et al. (2024) note that aligning technology with educational goals entails integrating it into the curriculum is key, ensuring cultural and language relevance and fostering student engagement.

To be effective in rural education, technology must address relevance, cost, reliability, and accessibility. A variety of tools have been identified as particularly useful in these settings, such as mobile devices, affordable laptops, and e-learning platforms that support interactive and flexible learning. Smart classrooms, projectors, radios, and educational television programs provide alternative ways to deliver content when internet access is limited, whereas Wi-Fi hotspots, SMS- or immersive virtual reality-based learning platforms, digital libraries, virtual classrooms, and videoconferencing are available with internet access, along with AI-powered educational tools such as Socratic, Duolingo, and chatbots (Mustafa et al., 2024). These technologies can support inclusive, adaptive, and engaging learning experiences in rural schools, provided they are chosen and implemented carefully.

The use of various technological devices in teaching enables educators to redefine teaching and learning (Mustafa et al., 2024). In addition, the adoption of technologies leads to the development of a flexible learning model that allows educators and learners to access a wide range of information sources, transforming the environment from one of authority-based learning to a community of learners. According to Kalonde (2017), integrating technology in learning promotes students' and teachers' critical thinking capabilities. Additional advantages include increased access to quality educational resources, enhanced teacher support and training, and overcoming geographic challenges (Maja, 2023). Moreover, adopting technology in teaching students in rural areas improves personalized learning, entrenches digital literacy, addresses affordability issues, and promotes language and inclusivity benefits (Hott et al., 2025). Thus, using technology in teaching students from rural settings has evident advantages. However, the integration can face barriers such as teachers' or students' various perceptions of technology or the school administration's lack of support. Although many schools have implemented strategies such as educator training, students' perceptions of the various forms of technology have not been explicitly studied in rural areas.

Ascertaining the use of technology in the classroom and students' perceptions involves various challenges. Heflin et al. (2017) state that most studies measuring students' perceptions and reviews of educational technology indicate a limitation in the ways of measuring student and teacher technology use. Previous studies in the sector have applied self-reporting surveys, with few studies measuring the integration of technologies through direct observation. Examining students' perceptions in multiple

schools has offered educators and the research community insights on successful technology integration in rural elementary schools, because students' acceptance and willingness to apply technology in learning play a significant role in its success (Maja, 2023; Mustafa et al., 2024; Russel & Haney, 2000). Additionally, Sundeen and Sundeen (2013) suggest that rural elementary schools often have limited access to technology; as such, knowing which types of devices work best for these students can offer crucial insight into implementing and allocating funds for the technology. In this chapter, I will provide background information on the study topic, state the problem and purpose, and present the research questions (RQs) as well as outline the problem statement, conceptual framework, and nature of the study. Finally, I will focus on the study's scope and delimitations, limitations, and significance.

Background

Education is experiencing unprecedented transformation due to technological developments. These transformations have disrupted students' ways of learning, more specifically for those from rural areas, whose access to technological devices at home is lower than those in urban areas. Technological changes have affected students' perceptions toward learning and influence the teaching process. According to Hamid et al. (2015), few studies focus on the manner in which social technology influences student learning experience and how technology makes radical changes to traditional ways of learning. Heflin et al. (2017) reported that technology is associated with positive student attitudes toward collaborative learning, and that how students learn in technology-based institutions is the key driver of the feel-good mood about education. The study offers a

key insight into understanding how technology can affect students' perceptions about learning.

The goal of applying technology in teaching is to enhance the learning process. Abachi and Muhammad (2014) studied the effects of mobile technology from both learners' and teachers' perspectives. They noted that the application of mobile technology classes has resulted in instructors' use of such technology to enhance student learning. The positive outcomes indicate that using the right technologies that students are familiar with can lead to better educational outcomes. This is one of few studies that has focused on individuals' perceptions of technology integration in learning. Domingo and Garganté (2016) agreed that despite the existence of multiple studies on the impact of technology in the classroom, few studies investigate teachers' perceptions of mobile learning technologies. Pate (2016) also noted that teachers' perceptions of technology affect their teaching practices; as such, it is useful and necessary to obtain information related to these perceptions.

There has been a significant gap in the number of studies focusing on teachers' and students' perceptions of the technologies used in teaching and learning. Briz-Ponce et al. (2017) argued that a perception gap exists in implementing mobile learning technologies. Montrieux et al. (2015) investigated teachers' and students' perceptions of tablet devices in education and found that the introduction of technological devices led to a shift in learning as they provided interactive, media-rich, and exciting new environments. However, stakeholders must ensure these technologies facilitate teachers' and students' understanding of the potential offered by technologies in education.

Studies on students' perceptions of technology use in learning have found a positive relationship between the two. Kirkwood and Price (2014) analyzed the importance of student perception of and reaction to changes in methods of teaching caused by the introduction of technology in education. They argued that technology influences how students view learning. Similarly, Venkatesh et al. (2014) emphasized the importance of understanding student perceptions and investigated the perception of preservice teachers toward laptops and mobile phones. Al-Emran et al. (2016) also argued that it is crucial to understand and investigate attitudes toward mobile learning because they provide insight into students' willingness to use technologies.

Understanding student's perceptions plays a core role in alleviating some of the barriers in technology integration. Baran (2014) argued that understanding perceptions provides opportunities to understand the challenges that teachers and students face after adopting technology. Elkaseh et al. (2016) studied the perceptions of teachers and students regarding the use of social media in e-learning and found that both have a positive attitude toward social networking because of the ease of use of these platforms. Cheok et al. (2017) collected and analyzed the views and experiences of 60 secondary school teachers in Malaysia and analyzed the barriers they faced in using technology in the classroom. They found that the lack of time resulting from teachers' workload and large class sizes led to the loss of control of student usage. Student perceptions play a major role related to class size, as it affects their motivations to follow the teacher's guidance.

Cheok and Wong (2015) investigated the determinants of e-learning satisfaction in teaching and learning. They investigated student attitudes toward mobile learning and found that students' acceptance of technology affects their learning satisfaction. They also found it essential to investigate the role of teacher and student perceptions on the acceptance and use of technology in learning. Similarly, Ozdamli and Uzunboylu (2015) argued that the successful integration of technology is based on understanding the perceptions of students and teachers. This information enables stakeholders to plan the integration effectively.

Other researchers have found a negative relationship between technology and student perceptions. Pate (2016) sought to understand how technology rewires the perception and mindset of students and believes that students using technology exhibit a notable difference compared to those who do not. Although technology needs to improve students' knowledge, Pate attested that it had a negative impact on their attitudes. Lim and Richardson (2016) mainly focused on the essence of social networking in students' lives. Despite the negative notions aligned to the use of technology, social networking and job marketing have drastically improved since students began using technology in their daily lives.

Students' perceptions of technology have been found to vary depending on their background. Cho et al. (2017) focused on students' level of technology usage in their daily lives and assessed how students implement technology to improve their communities, thus promoting student engagement. The researchers found that students from some backgrounds had a lower self-regulated learning capability that affected

technology adoption. Asfar and Zainuddin (2015) also found that rural students were less likely to adopt self-directed learning through information, communication, and technology compared with their urban counterparts. Rural students experience greater barriers in resource access and technological exposure that may cause negative attitudes toward information, communication, and technology learning.

Problem Statement

In the 21st century, technology has assumed a significant role in education for both teaching and learning. Educators view the implementation of technology in classroom settings as a top priority, and students are inundated with different types of electronic devices in educational environments. Understanding the impact of technology on students' perceptions of learning allows one to understand the psychological impact that technology has on human beings and may explain their behaviors and responses to different scenarios (Arkorful & Abaidoo, 2014; Hott et al., 2025). While many researchers have studied the influence of technology on education, only a few have investigated the influence of technology on students' perceptions of learning.

While students are the target users of technology, researchers have not focused on their perceptions toward technology and how it could affect the integration process. On the contrary, recently, most researchers have focused on alternate facets that connect education and technology (Ahiaku et al., 2025; Bulman & Fairlie, 2016). Despite efforts by stakeholders to prioritize research studies on the application of technology in education, most researchers, both in developing and developed countries, focus on technology's ability to improve educational outcomes in terms of achievements, demerits,

and its future application (Ahiaku et al., 2025; Bulman & Fairlie, 2016). As a result, students' learning experiences and attitudes toward enhancing school interactions using these modes of learning have been understudied. Therefore, current and future studies should investigate how students perceive enhanced forms of learning using technology (Ahiaku et al., 2025; Hamid et al., 2015; Hott et al., 2025; Maja, 2023). The information offers crucial insights into the planning of technological implementation, especially in rural elementary schools.

Moreover, the number of investigations of students' perceptions of learning using technology in rural elementary schools is limited. An assessment by Tyler-Wood et al. (2018) asserted that many district schools in the United States lack access to technology. Consequently, students in these institutions are unfamiliar with current technologies utilized by schools in urban areas. Thus, these studies indicated that the perception of populations in rural settings about the impact of technology in learning has been under - researched. Therefore, to ensure sustainability in education and to fill this gap, stakeholders in the education sector should facilitate research on students' perceptions of learning using technology among rural populations.

In summary, research indicates that students' perceptions are key determinants in the success of technology adoption in teaching and learning. Technological adoption will continue to increase globally, and information gathered from this research will ensure that students are considered when classroom technologies are adopted. However, there is limited research determining how students from rural areas perceive classroom technologies and what can be done to enhance their learning experiences related to

information, communication, and technology. This study was significant because it offered stakeholders key insights on how to strategize technology integration in rural elementary schools and aid students in adapting to the subsequent shifts in learning.

Purpose Statement

The main purpose of this research was to investigate the perceptions of students in rural areas between Grades 1–5 regarding the increased use of technology education. These included technologies that aimed to enhance students' performance, and challenges or barriers to adoption could lead to losses and a negative effect on their learning experiences. The focus of exploratory research is to investigate problems that have not been investigated (Long et al., 2016), and this study aimed to fill the research gap in integrating technology in education. These aspects enabled me as the researcher to conclude how students view the technology used in their rural setting.

Research Questions

This research was based on the overall question of rural school students' perceptions of technology. I sought to answer two RQs:

RQ1. How do students in rural elementary schools perceive the use of technology in education?

RQ2. How do students in rural elementary schools perceive the quality of the teaching–learning process when using or mediating technological resources?

Conceptual Framework

Stakeholder theory emphasizes the importance of inclusivity, and those impacted by the outcomes of decisions need to be included in the decision making (Harrison et al.,

2015). Their inclusion ensures that their needs are considered to enhance the effectiveness of the solution implemented. The successful completion of a project relies heavily on the participation and inclusion of stakeholders, and stakeholder theory emphasizes the ethics and value of including those affected by outcomes (Langrafe et al., 2020). The theory applies to integrating technology in education by ensuring that students are the main target and control for technology. This suggests that a stakeholder-centered approach is the most effective way of achieving the best outcomes. The theory intersects with many concepts of school reforms and strategies. Generally, it seeks to expand the number of people making crucial decisions in schools, including shared leadership, different voices, and the teams that offer leadership. Stakeholder theory also integrates community-based learning that helps connect what is taught at school with what is taught at home or in the community (Langrafe et al., 2020).

Notably, the stakeholder theory allows for mapping out other people who determine the project's success. Stakeholder mapping is the process of outlining all the parties who can influence the project's outcomes and their relationship (Langrafe et al., 2020). Interested parties in the technology implementation project include educators, students, and other institutional leaders. Students are key stakeholders in the implementation of technological teaching and learning devices. According to Sundeen and Sundeen (2013), the applied technology should consider students and their learning and reflect their needs. The strategy encourages students to be designers of their own learning, which is crucial in meeting technology implementation goals. Since students are one of the main stakeholders in technology implementation, the project should be

student-centered, which can only be achieved by first learning their perceptions. Further, it is only through understanding students' perceptions regarding technology that educators can determine which technologies to purchase.

The stakeholder theory was applied in the study of technological implementation in rural areas, as it enabled the researcher to determine how geographical characteristics affected the people involved in the project. Using stakeholder theory enabled this research to ensure that all parties involved play their role effectively to handle all of the barriers that could emerge.

Nature of the Study

In this research, I relied on primary data sources to investigate the RQs. Primary data are evidence obtained from firsthand knowledge (Mills et al., 2015). In the study context, firsthand information was obtained from ten students from five different rural elementary schools. The study's objective was to capture the perceptions and attitudes of students toward learning using technology (Marshall & Rossman, 2014). The data obtained was analyzed to determine relationships between concepts.

The study built on previous research, including recent studies on technology and teachers' and students' perceptions of learning, from the existing body of literature, which also provided this study with context and helped to identify the research gap (Cheng & Phillips, 2014). Students' perceptions should drive the future implementation of educational technology in the classroom. While technology should undoubtedly impact learning in a positive way, a qualitative study was necessary to provide insight into

whether current technologies are having the desired impact on learning in rural elementary schools.

In the last 2 decades, significant efforts have been directed toward integrating technology in education (Kuo et al., 2014). This study served as an exploratory investigation into the significance of technology on students' perceptions in rural elementary schools toward learning. The study consists of a basic qualitative design/generic design incorporating major methodologies, namely ethnography, grounds theory, and phenomenology. Researchers in the basic qualitative design discuss deviance degree from the methodology guidelines and acceptable rules. The generic design does not fall under these methodologies, and thus researchers divide it into genres of descriptive qualitative and interpretive description.

The approach also allows for data collection by starting with a general idea and using the research outcomes to determine the related issues with the research topic. The general idea of this study was that students' perceptions influence their adoption of technology. Using the research outcomes, the researcher determined other issues that could influence the adaptability of innovative technology related to student perceptions. Notably, research outcomes helped answer questions such as what, how, and why through interpretation of phenomena. For this study, the method enabled answering how students' perceptions affect technology adoption.

Definitions

Exploratory research: A model applied to researching a phenomenon that has never been researched, or for which the available research is limited. The model allows for the analysis of new and unconventional research topics.

Elementary school: An instructional setting where children from Grade 1 to Grade 5 receive primary education before transitioning to middle school.

Quality of learning: An improvement of educational gains from learning through technological devices.

Rural area: A geographical region situated outside urban areas, such as cities and towns, that is sparsely populated.

Stakeholder theory: A theory that offers professionals a model of analyzing the key players in a particular project, their interconnected relationships, and their level of influence.

Student perceptions: The set of processes students implement to analyze the situation they are facing.

Technologies: In this research, devices and applications used by students and teachers to enhance the learning process.

Assumptions

One of the assumptions applied in exploratory research is that the participants will share their experiences and can speak clearly and honestly about them. In this study, the researcher highlighted key relationships in the shared data and determined which information should be left out to ensure that the conclusions support the greatest

percentage of the population. According to Van De Mortel (2008), participants' immediate experiences can alter their overall view of the RQ and make them change their previously held stances; for instance, a student's bad encounter with a teacher several minutes before the study could influence that student's perceptions. This study assumed that participants from different schools would be honest in their descriptions and that their immediate encounters did not influence their descriptions.

Scope and Delimitations

This research addressed the phenomenon of students' perceptions of technology application in learning. Rural elementary schools were chosen for the research because they have not been significantly studied, while previous researchers have focused on the technologies themselves and ignored student perceptions. Students' perception of technology was selected because technology will continue to advance in the future, causing significant disruptions in learning.

One of the possible limitations in this research was the eloquence of students in Grades 1–5. Since the students' communication skills are still developing, they might have faced challenges expressing their perceptions of the technologies used in learning. The students may not have been persuasive enough in their speaking, and their understanding of certain technological concepts may have been limited. The students may have also failed to answer some questions, which could have affected the research outcomes.

The study did not incorporate students from urban areas, as they have been highly exposed to technologies compared to those from rural areas. The perceptions of students

from urban areas significantly vary from those of students from rural areas, and incorporating the two groups could have led to mixed outcomes. The research also did not include students who have not used at least one type of learning technology, as they did not have the necessary experience to answer the questions.

Limitations

In this qualitative study, I adopted the methodology of personal interviews for data collection. This interview method is time-consuming because the researcher has to work with the schedule of individual respondents (Flick, 2018). The researcher used purposive sampling to select participants from five rural elementary schools. Effective planning was used to overcome the challenge of time constraints. In some cases, the researcher had to conduct interviews by phone, Zoom, or Skype to ensure that data collection is completed within a reasonable timeframe.

Significance

This study may promote positive social change. The study was of importance to leaders in education who drive the rapid adoption of technology. Further, the study helped to identify barriers that inhibit technological adoption by students, offering learning institutions in rural areas information to guide future technology plans and a rationale for budget allocation during technology purchasing and prioritization. It is possible that technological devices sent to rural elementary schools are deemed effective learning tools even if they are not being used. Notably, the information from this study also enabled schools to understand the challenges teachers face while incorporating

various learning devices while teaching. Continuous technological growth requires schools to evolve using research-based technologies in implementation.

Further, the findings may help stakeholders reflect on the impact that technology has on learning in rural elementary schools, where limited technology resources necessitate greater efficiency and management of funds. The research also may provide policymakers in rural elementary schools with insight into the deployment of technology that improves teaching and learning. The study is critical because it reveals students' perspectives, as they are the most important stakeholders in the education system, and the ones most significantly affected by technology implementation in education. If students fail to understand the need to adopt a particular technology, they may not benefit from teachers' efforts to help them. Notably, I also considered the students' level of understanding concerning education.

Summary

Chapter 1 addressed issues relating to rural students' perceptions of technologies used in teaching and learning. There is a major difference between access to technological devices for students in rural areas compared to those in urban areas. However, the continued growth in technology has led to the need to ensure that rural students understand how learning technologies can enhance their classroom experiences. These enhanced experiences have a direct influence on educational outcomes. The research aimed to determine how students' perceptions could affect the technology integration process. After identifying the stakeholders, I applied an exploratory model to gain insights into the RQs. The approach was selected because it allows researchers to

analyze new and minimally researched topics. The section has also offered key delimitations and definitions, such as stakeholder theory. The next section will provide an overview of previous published literature on stakeholder theory and key concepts related to education.

Chapter 2: Literature Review

Throughout the United States and the world, educational leadership and administrators alongside policymakers are making significant efforts to support learners' needs in the 21st century. According to Tyler-Wood et al. (2018), regardless of their career interest, all students require a robust elementary education to ensure they gain the essential skills and competencies to excel in the educational processes and become successful in the global economy. Consequently, teachers and learners have been advised to utilize technology and contemporary innovations to achieve this desired outcome.

Technology-driven education can change the traditional classroom into a productive platform where student motivation, engagement, and performance are enhanced alongside promoting best learning practices that encourage student independence and equality. Nonetheless, the successful implementation of technology in elementary schools depends on the curriculum, technological adequacy, student perceptions, and school attributes. Despite the potential of technology to increase quality of learning, there exists a need to assess the feasibility of such approaches in improving inclusivity in providing education to all learners, including rural elementary students.

Technological and digital integration into the education system improves productivity and learning experiences, thus promoting positive learning outcomes. According to Blanchard et al. (2016), technology can stimulate creativity and innovation in learners, progressively directing them toward science, technology, engineering, and mathematics. In practice, instructors have adopted different models and approaches to using technology in schools. Still, while many schools have already embedded

technologies in the learning processes, these programs are not fully utilized in all districts or schools due to underlying attributes such as location in rural areas. Blanchard et al. (2016) note that the comparison between urban and rural elementary schools reveals that the latter population lacks sufficient technology to support quality learning. A significant number of students are underrepresented in the educational process. Inadequate funding and budgetary constraints can affect a rural elementary school's capacity to utilize technological opportunities to improve learning experiences. Consequently, inherent challenges in integrating technology into rural elementary schools should be addressed to support the flawless adoption of the necessary infrastructure and policy frameworks.

Implementing new technology in schools and organizations requires a practical framework that can ensure all the requisite factors to support the novel infrastructure. Within the education realm, different stakeholders, including financers, the government, innovators, and students, have to be involved to ensure that the project's outcome aligns with the overarching goals and objectives. In school, teachers play a central role in ensuring the technology introduced in instructional delivery and learning promotes the quality of educational processes. Blanchard et al. (2016) note that while instructors communicate the strategies, pedagogical objectives, and content through available opportunities, the efficacy of the entire process depends on how students perceive the additions to classroom learning or replacements to traditional approaches.

One critical problem in rural area districts is that because of the limited professional growth prospects for tutors, the incorporation of technology into the learning process may be ineffective in meeting the needs of learners. Nonetheless, the technology-

integrated curriculum can better prepare elementary school learners for the needs of the 21st century and improve learning experiences. Exploring students' perceptions of new developments is necessary since the students are critical stakeholders in the learning process. This study thus provided insight on how these changes affect education in rural elementary schools, thereby offering a platform to assess how new technology can be introduced to promote quality of learning while ensuring inclusivity in education.

The quality of learning in rural elementary schools shows a digital divide that can affect the overall goals and objectives of education. The concept of inclusive education is based on ensuring the success of all students, regardless of the school's location and the students' characteristics. As a result, it is essential to create and adopt technologies that support all children's educational processes based on their physical, financial, and vocational needs. Still, the stakeholders that contribute to the feasibility of inclusive technological education processes need to be engaged in designing and implementing their respective programs. While there is substantial literature highlighting the essentiality of involving teachers and educators in integrating technology in rural elementary schools, there is not much research assessing students' perceptions and quality of learning in their respective schools. Indeed, the success of integrating technology into the curriculum depends on factors such as the readiness of students to adopt novel technologies and the efficacy of the innovations in meeting the learning needs of each child. Studying learners' perceptions of the quality of learning using technology is thus critical in determining the efficacy of such systems in rural elementary schools.

Literature Search Strategy

Literature reviews contain an appraisal of the necessary research and studies contributing essential information on the topic under scrutiny. This section is dedicated to reviewing articles related to students' perceptions of technology in teaching–-learning processes. The sources used to collect the crucial data include EBSCO, Google Scholar, and PsycARTICLES. I searched peer-reviewed journals to find the required information. The keywords for the literature search included *quality of learning, technology-mediated learning, students' perception,* and *quality of learning in rural schools*.

Theoretical Foundation

Stakeholder theory is an ethical, efficient, and practical method of managing an entity in a turbulent and complex environment. Stakeholder theory is effective in learning institutions because it represents individuals and allows them to invest in the success and welfare of learning institutions and learners. Stakeholders in education include students, school administrators, tutors, members of staff and community, families, elected officials such as the members of a school board, and city and state representatives. Another group of stakeholders can include advocacy groups, organizations, committees, teacher unions, or teacher-parent organizations. All stakeholders usually have a stake in the learning institution and the learners, which implies they have a civic, professional, personal, or financial concern or interest. In addition, stakeholder theory is efficient since it emphasizes treating all stakeholders well in anticipation that they will reciprocate with positive behavior and attitudes (Harrison et al., 2015). It also harnesses stakeholders' energy to realize an entity's goals and objectives. Stakeholder theory is integral in

complex settings since entities managing stakeholders are equipped with information to improve decision making.

Stakeholder-engagement strategies are central to the successful improvement of learning institutions. The general notion is that by including more school community members in any process, learning institutions can create and foster a stronger sense of ownership. In some instances, when learning institutions make significant instructional or organizational changes and students, parents, or community members are not involved, criticism and resistance can arise. Thus, the involvement of various stakeholders can enhance communication and understanding. Stakeholder theory is applicable in the current study because it highlights the essentiality of engaging with all critical participants in the program. Indeed, the idea of a "stakeholder" in education portrays diverse school reform processes and strategies. For instance, shared leadership has gained traction because of the need to broaden the number of individuals effectively engaged in the decision-making processes of an organization or sector. Langrafe et al. (2020) noted that the stakeholder theory has gained traction as a strategic tool for managing research and organizational practices. A significant number of teachers and educational agencies within the education sector have been observed as key players in delivering quality services, but students' feedback has not been fully utilized in the process.

The stakeholder theory offers a practical perspective for ensuring educational goals are defined based on collective efforts from all stakeholders at different levels, including the pupils. In the current study, the conceptual framework highlighted how students' perceptions of educational technology can improve the quality of learning.

Stakeholder theory provided a platform to advocate for management and operational decisions that consider the stakeholders' needs, thereby ensuring inclusivity (Langrafe et al., 2020).

Stakeholder Theory and Elementary Education

The educational needs of the 21st century are complex, given the utilization of diverse concepts and practices to improve the quality of education. The main goals of the modern educational sector are to promote inclusivity and equal, fair education practices, meaning that stakeholders such as the government and teachers should respond to the needs of learners with different attributes in the educational process. According to Uygur et al. (2020), there is increased emphasis on the need for education to adhere to standards such as nondiscrimination, convenience, accommodation of special needs, and adoption of alternative learning and instructional approaches, which can meet demand while also utilizing available opportunities in the sector. A fair-minded comprehension of education under the concept of inclusive education requires that learners in urban and rural settings are properly attended to. The driving force for an inclusive education policy is the need to reduce discrimination in delivering quality learning to learners based on their inherent characteristics, such as elementary school location. Thus, there is an endemic need to promote inclusive education programs that encourage learners' quality of education regardless of their differences.

Given the essentiality of inclusivity in educational policies and practices, this study utilized a stakeholder framework to illustrate the essence of rural elementary students' perception of the quality of their learning through the adoption of technologies.

This concept is used in practice to emphasize the importance of inclusivity. In essence, the stakeholders in any decision-making process should be involved because the outcomes of the choices are likely to affect them. Langrafe et al. (2020) note that the success of most projects depends on the level of engagement amongst those who are directly affected and the ones who influence the processes. The stakeholder conceptual framework thus exemplifies the need to integrate students into the decision-making processes on the use of technology in learning to ensure that the overall outcome of any program meets the needs of the learners. Moreover, stakeholder theory identifies students as the key players and asserts the essence of other participants, such as the parents of the learners, the community, and the teaching faculty. Therefore, the feasibility of technological integration into rural elementary education should be based on a stakeholder-centered approach that can highlight the necessary needs of all players.

Stakeholder Theory and Technology in Rural Elementary Schools

The use of technology in learning institutions has become more pronounced in the contemporary educational environment. It has become impossible to adequately evaluate education from technology. As the COVID-19 pandemic hit the nation, education was one of the areas adversely affected. Efforts were made to ensure that children benefit fairly and equally from accessing education. Consequently, arrangements such as live education lessons held over the web were organized. However, the digital divide between urban and rural learning institutions has led to some students continuing their education while others experienced a significant interruption.

Regarding access to technology, rural schools do not enjoy similar funding levels for educational technology as urban learning schools, thus limiting the chances that rural students have for continued learning (Wang, 2013). The disparities in rural-urban infrastructure show that the urban region contains telecommunication capabilities and a properly functioning electric grid to which many rural areas are still not connected, which disadvantages a considerable number of students. Students residing in rural areas lack computer hardware, software, and reliable internet connectivity. The lack of technological access is a chief barrier to the incorporation of technology in learning.

The lack of skilled and experienced teachers and teachers with inadequate technical training has been a recurrent problem for rural learning institutions. Research has indicated that learners from rural learning institutions achieve relatively lower scores when it comes to indicators of internet inequality, including access to digital content, internet usage, technological support, and autonomy of technology use, and are hence disadvantaged when it comes to technology usage compared to their urban peers (Wang, 2013). Furthermore, students who come from low-income regions usually utilize the available computers for repetitive tasks.

On the other hand, learners in urban areas usually use technology for problem-solving, higher-order thinking, and other activities that are intellectually challenging. The primary issues that contribute to the digital divide in education in rural areas affecting the key stakeholders of education include accessibility, hesitancy, and development. Accessibility relates to lack of software, hardware, and internet access due to accessibility or affordability issues. Most learners in rural areas lack access to laptops and continue to

experience power problems. Regarding hesitance, teachers are resistant to adapt to online learning sessions, and with limited training, this process becomes more challenging. Tutors and administrative staff are viewed as key stakeholders in preparing programs and organizing and implementing a comprehensive, inclusive curriculum. The digital divide significantly impacts these groups of stakeholders, especially in rural elementary schools (Wang, 2013).

Stakeholder Theory and Students' and School Staff's Perceptions

The enhancement of student learning and achievements alongside creating an effective environment for learning is significantly dependent on the beliefs of teachers regarding the academic achievement of students and their focus on the academic task. Studies have revealed that increased job satisfaction for school staff can be attributed to a positive climate in the school. Teachers in urban areas often feel self-assured regarding their competence in leveraging technology. They hold the view that technology is an essential part of their teaching and have additional software as well as hardware to promote students' learning. On the other hand, teachers in rural areas are affected by a lack of adequate technology infrastructure, which can affect their overall morale, especially in the face of the current environment where education is transitioning to an online environment (Kilinc, 2013).

Student perceptions of their own learning is a key aspect of the learning institution's climate. Student perceptions are influenced by relationships with their teachers, the school climate, and the behaviors of other students. According to Caglayan (2013), students who have positive school climate perceptions are more likely to enjoy

learning and participate in various activities. The home environment, school setting, and learning environment are key contributing factors to a negative or positive school climate (Barile et al., 2012). Through this study, it was important to examine the interactions between students and teachers as key stakeholders in the learning setting and how technology leads to a positive school climate.

Literature Related to Key Concepts

This section provides an extensive literature review on students' perception of technology in education alongside quality of learning while using technologies to mediate learning. The articles reviewed have been categorized into the following: (a) definition of quality of learning, (b) students' perception of the use of technology in education, (c) quality of learning through technology-mediated learning, (d) quality of learning through technology-mediated education in rural schools.

Definition of Quality of Learning

The conception of quality is essential in understanding the impact of technology on educational processes in urban and rural elementary schools. Many discussions on the essentiality of quality education have been held at the international and federal levels. Still, the comprehension of quality education not only focuses on managerial and oversight perspective but also assesses outcomes through students' performance and willingness to use different approaches (Laurie et al., 2016). Still, the underlying concern is on how to ensure quality learning while utilizing cost-effective strategies. These requirements are particularly challenging because the education sector is continuously evolving, meaning that technology in education is primarily based on improving quality.

According to Laurie et al. (2016) the definition of quality in education is ever-changing because of contextual factors such as curriculum, content taught in class, and school location. Nonetheless, given that quality learning is pivotal in defining students' performance, effort should be made to ensure that locally, nationally, and culturally appropriate systems are adapted to the teaching–learning processes (Laurie et al., 2016). In essence, the effectiveness of any educational strategy is defined through the approach's positive impact on the learning process. Therefore, quality of learning is critical in understanding the effects of technology-mediated teaching and learning at rural elementary schools.

Quality of learning is a critical topic in education because it defines the effectiveness of the strategies adopted in the sector to support teaching and learning processes. Quality of learning derives its conceptualization from education quality, which is founded on four fundamental theories: postcolonial theory, the human capital approach, the human rights approach, and the social justice approach. From the postcolonial perspective, the conditions that define current education sectors are a consequence of colonial imposition, which has led to conditions such as differences in quality of learning based on socioeconomic status, the cultural inappropriateness of learning materials such as books, the teacher-centered pedagogy, and the gendered perceptions in schooling and specialization (Laurie et al., 2016). The human capital approach suggests that investments in education are likely to lead to quality of learning, which positively impacts economic growth.

Given that a nation's workforce success and productivity are linked to financial performance, investing in education can effectively improve quality teaching (Laurie et al., 2016). Human capital theorists argue that schools must be competitive and held accountable for their output through benchmarking examinations to encourage quality of learning (Laurie et al., 2016). The quality of learning can hence be defined from a multifaceted perspective that utilizes different theories, specifically those that show the connectedness between the teaching–learning process and the desired outcomes. Quality of learning is thus a complex concept that can be comprehended from diverse perspectives, including the students' output and economic performance.

The evaluation of quality is in diverse ways opinionated processes that are based on contextual attributes. Given the nature of this study, it is worth noting that quality should not be defined from a general perspective but also from specific points of view, such as special-needs education. In broad terms, quality of teaching and learning practices focuses on the adequacy of implemented programs in the classroom and the concept of equity. According to Hedegaard-Soerensen and Tetler (2016), the appropriateness of the programs is determined by how different teaching and learning approaches are designed and implemented to meet the needs of the students. Nonetheless, teachers may have contrasting views on the use of diverse pedagogical approaches because, in the process, teachers should be categorized into different tiers to ensure they deliver all the requisite needs. In essence, adopting some strategies may warrant a need to increase teaching capacity to meet growing demand in the sector. Therefore, quality of learning describes how the teaching process is made sustainable in the learning activities.

Indeed, teachers should base their teaching plans and strategies on community needs and the individual concerns of the students (Ubaidillah et al., 2020). For that reason, quality learning can be defined through a connective pedagogy that connects all students with their specific learning needs, thus ensuring that students benefit from the curriculum.

Within the realm of special needs and conditions, a key indicator of quality learning is the pupils' participation in the teaching–learning processes. According to Hedegaard-Soerensen and Tetler (2016), engaging students motivates them to participate in the learning process, promoting positive learning outcomes. This perspective aligns with other studies suggesting that quality teaching and learning processes allow students to learn, participate in the school curriculum, and accrue the institution more responsibility to assess performance based on equitable grounds. In practice, quality of learning is defined from a holistic perspective that comprises the instructor's acknowledgment and administration of learners' individual interests and capacities, without solely banking on inadequacies as to the key factors. Quality is a multifaceted concept that defines the broad understanding of learning processes and the mixture of personal attributes and socioeconomic and academic dimensions (Uygur et al., 2020). Quality Learning, then, has to do with the transfer of knowledge and the partnership between tutors, learners, and their families.

Quality remains an integral issue in higher education. Vagarinho (2020) conducted a study to determine what quality entails in e-learning, including what should be included in the definition. He found that quality is a universal expectation among stakeholders in education and similarly established that given quality's importance and

stakeholders' expectations, the definitions of educational quality in the literature are disappointingly dispersed. This research is important for the current study because it demonstrates that quality has been instrumental in shaping how schools gain competitive advantages and the extent to which students gather knowledge and skills that enhance their success in various career fields. For instance, quality education prepares students to enter society and participate in the unfolding economy (Vagarinho, 2020). It also gives schools competitive advantages and provides ideal contexts for integrating technology into learning to improve learning outcomes for students. The study is relevant to the problem statement outlined in this research because it stipulates that technology integration and adoption into the learning process should accommodate the interests of learners and existing learning standards.

On the other hand, Schindler et al. (2015) provided a synthesis of the literature on defining quality in the context of higher education. He found that as scholars strive to understand quality in education, they hold that the best way to achieve quality is through available standards and best practices. As such, scholars are providing competing and broad definitions of quality in education to guide educators and students. Based on the broad definitions, scholars assert that the definition of quality in education should incorporate the characteristics of quality education, including continuous improvement, continuity of learning, and ability of education to prepare students to handle complex problems (Schindler et al., 2015). The findings from this study were integral to the current research because they demonstrated that available standards and evidence-based practices should inform the definition of quality of learning. Furthermore, the study was

relevant because it stipulated that the adoption of technology in learning institutions should be based on the characteristics of the quality of education and the available educational standards.

The state of research on the definition of quality in learning implies that there are ongoing studies to make sense of the concept. For example, researchers have provided detailed definitions of quality in learning and compared existing definitions to understand their differences and similarities. Furthermore, studies have explored the feasibility of developing a universal definition of quality in learning. In efforts to provide a universal definition, Schindler et al. (2015) and Vagarinho (2020) concluded that quality in learning is a dynamic concept, and developing a universal education will limit the scope of learning. However, studies have not explored the influence of culture on the definition of quality in learning. Instead, their definitions are limited to the role of technology, educators, and students' involvement in improving the quality of learning. Despite the limitations of the existing literature, scholars have succeeded in providing broad definitions of quality in learning to provide different definitions that align with the interests of various scholars. Similarly, they have also integrated terms such as quality assurance in the definition of quality in learning to nurture consistency. As such, the consensus on the definition of quality in learning is that there are no universal metrics for defining quality in learning and supporting the adoption of technology to standardize learning.

Students' Perceptions on the Use of Technology in Education

Understanding students' perception of technology in schools is critical to understanding the efficacy of technology-mediated teaching and learning processes. The Oxford Learners' Dictionary (2019) defines perception as "the way you notice things, especially with the senses, the ability to understand the true nature of something, and an idea, a belief or an image you have as a result of how you see or understand something." Within the education sector, students' perception of learning processes is based on diverse aspects, including the learning outcomes and the approaches used in instructional delivery. These factors are primarily dependent on an academic environment where the learning location can significantly impact the individual pupils' learning and the quality of their outcomes (Baker & Galanti, 2017). The results students attain are essential in defining their perceptions rather than what and how they learn in school. In practice, students interact with diverse tangible and intangible factors that determine their satisfaction levels, thereby affecting their perceptions of the teaching–learning process. Understanding the quality of learning using technology is, therefore, dependent on the pupils' outcomes and comprehension of the approaches used in instructional delivery.

Comprehending students' perceptions is significant in determining their needs, given that different generations have diverse levels of acceptance regarding the use of technology in education. According to Alhammadi (2018), the education sector is complex because it comprises people from different generations as teachers and learners. The current era in elementary schools finds technology an exciting avenue for promoting learning quality. Still, some teachers may be from the Baby Boomer generation and may

not be technologically savvy. Flexible teaching and learning experiences are crucial within innovative pedagogies that promote quality learning. However, fully understanding the impact of the technologies requires extensive research on how users perceive the innovations. According to Yeou (2016), technologies such as Moodle and other web-based learning systems have proven to be a popular platform for promoting quality of learning. Still, their success is not guaranteed if students are unwilling to use them. Popovici and Mironov (2015)'s research on students' perception of using e-learning technologies outlined that some students have shown initial reluctance to adopt some technologies. As such, understanding the motivating factors behind such feelings is critical to promoting the efficiency of integrating technologies into the teaching–learning processes (Ahiaku et al., 2025; Ashfaq, 2025; Uygur et al., 2020). Students' perceptions, then, play a pivotal role in the acceptability of technology in education. As such, the current study seeks to add to the existing literature by demonstrating the importance of acknowledging students' perspectives during technology integration into the learning process.

Popovici and Mironov (2015) studied students' perceptions of using e-learning technologies. They found that considering students' perceptions toward e-learning technologies and their expertise in the field is important for the successful development of academic programs because the attitude of the end user towards the application of information technology is one of the most effective factors (Popovici & Mironov, 2015). They argued that efforts to integrate technology into the learning context without acknowledging the interests and perceptions of learners limits success and undermines

the quality of education. Similarly, the study established that addressing students' concerns about e-learning technologies and strategies used to support e-learning offers a better understanding of how technology can improve the learning experience, making it more motivating and efficient (Popovici & Mironov, 2015). This study is important to the current research because it has found that the successful adoption or implementation of technology in e-learning contexts should acknowledge the interests and perspectives of learners. It also demonstrated that an in-depth understanding of the limits and potential of technology in improving learning quality begins by addressing the questions that learners have about technological tools.

Liton (2015) also examined students' perceptions and efficacy of using technology in teaching English. The study found that successful technology-mediated teaching–learning has already created new trends and impacted students' learning motivation and emerging new models of pedagogy. The study also revealed that students were immersed in the learning process actively and enthusiastically but that many did not know how to integrate technologies into their learning process. As such, he established that integrating students' perceptions enabled educators to train learners on ways of integrating technologies into the learning process. This strategy also informs learners about how technologies can increase their participation and inclusivity in the learning process. These research findings align with the goal of the current study because they indicate that involving learners guarantees the successful integration of technology into the learning process. Similarly, it depicts a strong correlational relationship between the adoption of technology and quality learning in rural elementary schools.

The research on students' perceptions of the use of technology in education has already outlined the importance of these perceptions in shaping successful technology adoption in learning. Similarly, the studies have stipulated the methods that scholars and educators can leverage to gather students' perceptions of technology use in learning. Popovici and Mironov (2015) and Liton (2015) established that student engagement through surveys and open-ended interviews allows educators to identify their concerns about technology integration into learning. This prompts the development of technology implementation procedures that align with the interests of learners. However, the research into students' perceptions of the use of technology in education has not explored how the impacts of cutting-edge technologies on students' success have informed their perspectives on technology use in learning. Regardless of these limitations, the existing studies have succeeded in providing consistent explanations of the role of students' perceptions in informing the success of technology adoption, establishing the consensus that gathering students' perceptions on how to integrate technology into their learning practices and spaces informs the success of the process.

Quality of Learning Through Technology-Mediated Learning

Technology enriches education by expanding access to global learning resources and enabling personalized, engaging instruction. Ashfaq (2025) explains that digital tools promote a learner-centered environment by providing real-time feedback, simplifying complex concepts, and adapting to individual student needs. This personalization deepens engagement and improves outcomes. However, the benefits of technology must be managed equitably. Arar et al. (2023) also emphasize that educational leaders must

integrate leadership and learning theories with technology in a way that avoids reinforcing existing inequalities, particularly in underserved communities. The success of technology in education depends not only on its capabilities but also on how intentionally and inclusively it is implemented to support all learners.

Emerging technologies have also redefined pedagogy by shifting the focus from passive content delivery to interactive, collaborative, and problem-solving approaches. These tools transform conventional teaching models, encouraging student participation and customized learning paths (Mena-Guacas et al., 2025). Furthermore, technology promotes global peer interaction, which enhances communication skills and introduces students to diverse problem-solving strategies. According to Ashfaq (2025), digital platforms create virtual communities where learners engage across cultures, broadening their perspectives and fostering a deeper understanding of global issues.

Analyzing the historical development of educational processes reveals that the changes observed in the sector are based on diverse needs centered on improving learning processes. For instance, the superficial training that teachers had to undergo in classical educational techniques was meant to ensure that professionals were competent enough to address the learning needs of students at defined periods (Jennings, 2017). However, education has permanently changed based on the contextual capacities of the system and the available opportunities for improving learning. Technology-enhanced knowledge has progressively gained traction in the education sector because of the perceived benefits of using such innovations in the education realm. In addition, integrating technology into teaching and learning processes has introduced a new mix of responsibilities that learners

and instructors must observe to ensure the quality of learning. Nonetheless, utilizing different technological approaches in education provides learners with flexibility that can promote understanding, encouraging them to perform better because the novel platform addresses their needs and capacities (Jennings, 2017). The use of technology-mediated learning is also not an unexpected concept, given that transformation in education has been based on the need to improve the quality of learning while utilizing available opportunities such as teacher training.

The global COVID-19 pandemic forced disruptions in different sectors, including the education realm, and successful institutions have managed to remain operational by leveraging technology. While technology had previously been restricted to higher education for an extended period, the crisis revealed that using technology within the entire school curriculum is viable provided that the requisite infrastructure is present (Tawafak et al., 2018). Technology has advanced through the years, and introducing faster means of communication and educational development has created a positive impact. With the onset of the global pandemic, it became evident that education relied on technology to actualize teaching and learning processes (Alhammadi, 2021). Before the crisis, technology had already been adopted in higher education and other lower levels of education to promote engagement with students and improve their critical thinking and problem-solving. Integration of active learning processes into conventional classrooms has provided instructors with adequate means of assessing students' performance and offers essential knowledge for improving learning experiences based on learners' needs.

Technology-mediated education is, hence, an ongoing process that is based on the goal of enhancing quality learning.

Teaching and learning processes actualized through technological aids are meant to improve the engagement between instructors and learners. Educational reforms that suggest the incorporation of technology into the education system focus on the goal of inclusivity, which addresses all the needs of students regardless of the underlying conditions (Licorish et al., 2018). However, the main question in using technologies is whether these innovations promote learning experiences while utilizing appropriate pedagogical opportunities from the students' perspectives. The demand for traditional classroom approaches is declining because of the criticality of teaching technological literacy to promote students' productivity in the current economy (Krishnakumaryamma & Venkatasubramanian, 2018). Nonetheless, it is essential to understand the efficacy of various student learning processes that promote positive performance. Depending on the practices, technology can act as a mediator or a barrier to quality learning processes. Different literature has shown that technology fosters the quality of student learning processes by offering opportunities for high-quality education and deep learning strategies. Still, the complexity of the process can also act as a hindrance (Krishnakumaryamma & Venkatasubramanian, 2018). Consequently, rural elementary students can benefit from technological affordances that provide quality learning environments.

Henrie et al. (2015) measured student engagement in technology-mediated learning. They found that using digital technology to deliver content, connect learners,

and enable anytime, anywhere learning is increasing, but that keeping students engaged in technology-mediated learning is challenging. Similarly, they established that the effective use of digital technology in learning requires that educators implement practical, innovative, and adaptable instructional strategies to enhance student engagement. These findings are integral to the current research because they indicate that technology-mediated learning will improve education quality through enhanced student engagement levels. Similarly, it is relevant to the research problem through its assertion that innovative and adaptable instructional strategies that improve learning require the integration of digital tools into the learning environment. The authors concluded that student engagement is a useful indicator in measuring the success and strengths of a technology-mediated learning environment, which means that continuous tracking of student engagement should define the integration of digital tools in learning.

Owusu-Agyeman and Larbi-Siaw (2018) explored the factors that enhance student–content interaction in a technology-mediated learning environment. The authors revealed that effective student–content interaction is strongly enhanced by expansive learning through its five key elements: epistemic relation, contradictions, digital learning content, a conglomeration of views, and cognitive transformation. Their study indicated that digital learning content and tools increase students' interaction with course materials, leading to improved education quality. Their findings are appropriate for the current study because they define the relationship that exists between the impact of technology in learning and the interactions that students have with technological tools in education contexts. It demonstrates that students' continuous interaction with digital content

improves their perception of technology in learning, contributing to improved learning outcomes. Thus, the study is relevant in providing the context for understanding the quality of learning in rural schools leveraging the technology-mediated learning approach.

The research on the quality of learning through technology-mediated learning has played an integral role in outlining the incorporation of digital tools in learning, the extent to which the digital tools have improved learning, the relationship between technology-mediated learning environment and student engagement levels, and the impact of technology-mediated learning on student's mastery of course materials. However, the existing literature does not explore the link between the successes of students and the technology-mediated learning environment. This implies that existing studies do not explore the extent to which the student's perception of technology application in learning is informed by the success of technology-mediated learning environments. Despite these limitations, the literature has played an integral role in stipulating the role of technology-mediated learning in improving education quality through effective student-content interaction and student engagement in classrooms (Henrie et al., 2015; Owusu-Agyeman & Larbi-Siaw, 2018), providing a direct association between technology-mediated learning and continuous improvements in education quality. Thus, the consensus on the quality of learning through technology-mediated education is that the learning approach improves student engagement and interactions, leading to enhanced learning and education quality.

Quality of Learning Through Technology-Mediated Education in Rural Schools

Technology use in education is being adopted in different parts of the world. Still, the outcomes of novel pedagogies depend on contextual factors that determine the feasibility of educational programs. While various studies note that technology improves the quality of learning by promoting engagement, boosting learner confidence, enhancing critical skills, and ensuring all students' needs are met, rural settings face diverse challenges and situational attributes that can affect the desired outcomes of the technology education (Hott et al., 2025; Islam et al., 2024; Maja, 2023; Mustafa et al., 2024; Wang, 2013). Unlike the developed metropolitan regions, it is uncommon for rural schools to have the financial and technological capacity to introduce the necessary infrastructure and expertise for actualizing technology-mediated education. Moreover, schools may not be able to promote training and development of teachers and instructors with the essential technical skills and professional competencies to convince students to adopt novel opportunities in education. The influencing factors that create barriers to quality teaching impact pupils' perceptions of the use of technology because they have to define their learning strategies based on available opportunities (Tyler-Wood et al., 2018). Therefore, despite the efficacy of technology to improve the quality of learning in the broader perspective, situational contexts affect the educational process, determining whether technology hinders or promotes quality.

Rural areas have complex educational needs resulting from a lack of resources and an insufficient number of professionals to support growth. Still, some regions have made significant efforts to promote technological integration into elementary schools,

where innovations such as mobile and web applications have been adopted to improve learning experiences (Islam et al., 2024; Kumar Basak et al., 2018). Nonetheless, even with such underlying progress, rural areas face challenges such as low internet bandwidth that affect the quality of the teaching and learning process, thereby creating a negative perception of internet technologies and education (Maja, 2023; Mustafa et al., 2024; Wang, 2013). To understand how students in elementary schools perceive the use of technology, it is essential to assess teachers' capacity to deliver quality instructions through these innovations.

Another critical issue that may contribute to students' negative perception of the use of technology is outdated technologies that require replacement, though lack of sufficient funding creates barriers (Okoye et al., 2021). Indeed, students have to use troublesome school computers, laptops, and workstations, which make their experiences problematic while negating the benefits of using technologies (Hott et al., 2025; Tyler-Wood et al., 2018). Consequently, the perceptions of rural elementary school students on the use of technology depend on how effectively the educational systems meet their needs.

Technology-mediated education in rural schools aims at ensuring that comparable education exists in local and urban schools. Stevens (2013) studied the application of technology-mediated learning to sustain rural schools and found that technology-mediated education provides ways of academically and administratively linking rural schools in dispersed communities, thereby creating collaborative learning environments to enhance education quality. He also established that technology-mediated education has

nurtured internet-based teaching and learning structures for senior high school students in rural settings, thus guaranteeing that they receive an education comparable to that provided in urban education settings. Stevens also demonstrated that technology-mediated education has fostered the integration of distance learning in rural schools, leading to adaptability and flexibility in learning. The findings of the study are relevant to the research problem because they demonstrate how technological tools integrated into the learning environment create responsive and collaborative learning environments designed to improve education quality. Similarly, the findings are relevant to the current research because they outline that technology-mediated learning increases collaboration and coordination with school contexts to enhance learning outcomes.

Trabelsi et al. (2022) explored technology-mediated physical education teaching practices in Tunisian public schools to demonstrate the extent to which technological adoption is shaping education quality in rural schools. The researchers found that technology-mediated education in rural schools has increased digital literacy among students and teachers, thus nurturing positive attitudes toward technology adoption in learning. They also established that the lack of training and support to keep up with the changes associated with continuous advancement in technological tools used in technology-mediated learning has undermined the success of the learning approach. As such, the study was relevant to the current research objectives because it stipulates that successful technology adoption in learning should be characterized by the provision of appropriate technological resources and training to enhance the learning outcomes of students and shape their perceptions towards technology use in education. It was also

relevant to the current study due to its recognition of the changes, including the training and technological resources, required to shape the adoption of technology in learning or enhance its potential to improve learning outcomes.

The research on the quality of learning through technology-mediated education in rural schools has demonstrated that technology is one of the driving forces behind the transformation of education. For example, the literature demonstrates that technology-mediated learning has supported the adoption of distance learning in education and increased flexibility and learning (Trabelsi et al., 2022). Similarly, the research on the quality of learning through technology-mediated education in rural schools demonstrates that technology has improved the quality of learning through internet-based learning and collaborative learning tools that it has integrated into rural schools (Islam et al., 2024; Mustafa et al., 2024; Stevens, 2013). However, the research has failed to outline the level and type of training or the appropriate technological tools that should follow the integration of technology in rural schools. Despite these limitations, scholars have played an integral role in demonstrating that technology-mediated learning is steadily transforming learning, including the transition from conventional learning to e-learning. Thus, the consensus on the quality of learning through technology-mediated education in rural schools is that providing students and educators with appropriate training and technology tools increases the outcomes of technology adoption in enhancing education quality.

Summary and Conclusions

Technology is an innovative means of improving the quality and efficacy of teaching–learning processes. The application of these novel trends in education confirms the dynamism of the sector, given that the changes observed in the past decades have been based on the need to promote quality and inclusivity while utilizing available opportunities. Educational development has occurred under the driving force of meeting students' learning needs, thereby promoting better academic performance. As a result, the utilization of technology in education has evolved under a holistic pedagogical transformation that seeks to cater to all learners while improving engagement and productivity of the teaching–learning processes. In the long run, technology is viewed as an impetus for enhancing learners' capacity to perform, and such aspects are illustrated in both rural and urban schools, which have adopted novel approaches to improve the productivity of the teaching–learning processes that were previously hindered by traditional classroom methodology.

This literature review was guided by stakeholder theory, which exemplifies the need for including students in making critical decisions regarding incorporating technology into the learning processes. Implementing technology into elementary school systems has different outcomes based on contextual factors such as school location, financial availability, and the presence of instructors with technological skills. These factors collectively affect how students perceive the utilization of technology in their educational processes. The literature review provided an outlook of the quality of learning using technology in urban and rural settings, thereby explaining the diversity in

students' perception of such processes. The next chapter will outline the study research design and methodology.

Chapter 3: Research Method

In this study, I analyzed students' perceptions of the use of technology in rural schools. Additionally, I investigated the effect of technology on students' thoughts on learning. Understanding these effects can be critical in improving awareness about technology's psychological impact on human behaviors (Arkoful & Abaidoo, 2014). Few studies have examined the influence of technology on students' perceptions of learning. This study sought to increase information regarding these perceptions by interviewing students between Grades 1–5 living in rural areas. Examining these students' thoughts on using technology in their schools was critical to ensure continued investment in technology that will improve education for students in both rural and urban areas.

This chapter includes an outline of the strategies and methods the researcher used to gather data from the students who participated in the study. The chapter begins with a description of the research design and the rationale for this study. The following sections will then analyze the researcher's role and assumptions that might have impacted the study's outcomes. This section will also examine the methodology emphasizing the rationale for selecting participants, the type of instrumentation used, recruitment procedures, participation, the collection plan for data, and the plan for analyzing this data. This section will also outline how the researcher achieved the study's trustworthiness and any ethical issues that emerged from the study.

Research Design and Rationale

Determining what students feel about technology can be a complicated process that requires a substantial methodology. This methodology must provide the researcher

with the opportunity to acquire a broad image of students' thoughts on the presence of technology in their rural elementary schools. It will also allow the researcher to engage in a deep examination of the RQs, resulting in stronger conclusions. The following RQs addressed students' thoughts on using technology in rural schools:

RQ1. How do students in rural schools perceive the use of technology in education?

RQ2. How do students in rural schools perceive the quality of the teaching–learning process when using or mediating technological resources?

Over the last 20 years, different stakeholders in the education sector have focused on integrating technology into the education process (Kuo et al., 2014). Technology has a strong ability to create positive attitudes in students in collaborative learning. Despite growing interest in the benefits of incorporating technology into education, few researchers have examined how social technology impacts students' learning experiences. Moreover, few studies have examined the extent to which technology has brought radical changes to traditional learning (Hamid et al., 2015). There is also a gap in analyzing teachers' attitudes regarding mobile education despite the many studies investigating the effects of technology in modern classrooms. The lack of knowledge presents a significant challenge in determining how the application of this technology could support student learning (Abachi & Muhammad, 2014). Briz-Ponce et al. (2017) also found a significant gap in the implementation of mobile learning in the teaching process.

This study provided helpful information that can fill the gap by providing students' specific perspectives on using technology in rural schools. As noted, most

studies have either failed to examine the effects of implementing technology in education or have focused on teachers' perceptions. To fully understand what students in rural schools think about technology in their schools, the study used a qualitative design that incorporated the methodologies of ethnography, grounded theory, and phenomenology.

According to Neubauer et al. (2019), phenomenology can help researchers learn from others' experiences. Phenomenology is a type of qualitative research that emphasizes describing the meanings attached to a specific experience in the context of what people experienced, how they felt, and what they underwent in a given situation. The researcher has the chance to ask questions about the experience and the meanings the students derived from the experience (Gill, 2020). Phenomenology is also a helpful approach because researchers are encouraged to set aside any assumptions or biases they might have about students' experiences and feelings about the subject being studied. This design is helpful because it allows the researcher to collect information about the students' motivations (Gill, 2020). The researcher can develop new perspectives on the topic or encourage policy changes through this approach.

On the other hand, ethnography refers to studying individuals within their environments using such methods as face-to-face interviews or observation. By immersing themselves in the real world, researchers can describe and discover specific elements and shared cultural details and analyze the meaning of their thoughts on a given subject (Jones & Smith, 2017). By collecting information from interviews and observations that are later contrasted and compared, ethnography provides a beneficial qualitative strategy. This strategy could provide detailed descriptions of various social

aspects, including beliefs, interactions, behavior, and actions. Researchers can submerge themselves into a specific social setting, thereby creating the chance to understand a particular social action (Jones & Smith, 2017; Reeves et al., 2013).

Grounded theory focuses on constructing or producing an approach that can explain a specific process related to the topic under study. One of the most distinctive features of grounded theory is that it seeks to develop a theory based on the collected data. The subject under investigation might only be understood by examining the thoughts, feelings, and perspectives of those who have directly experienced or interacted with the topic (Tie et al., 2019). In the context of this study, phenomenology, grounded theory, and ethnography will be helpful research approaches within the qualitative research strategy to understand the perceptions of students in rural areas about the use of technology.

Through grounded theory, ethnography, and phenomenology, the researcher collects information from the sampled participants using interviews. Through the interviews, the researcher has the opportunity to determine the participants' feelings about the subject under study, leading to new perspectives and thoughts about the topic. The gathered information can provide further information that policymakers and stakeholders in the education sector can use (Jones & Smith, 2017). Grounded theory provides a method of analysis and the resulting product of this research, allowing the researcher to create a new approach from the gathered data through a systematic process. The researcher uncovers elements such as social processes and relationships as they encourage the discovery of different themes through phrases and keywords.

Role of the Researcher

I carried out all of the necessary actions to complete this qualitative research. As I conducted the research, I understood the potential danger of my personal biases and their impact on my findings. I found considerable gaps in research on students' perceptions of the use of technology in their schools, especially for those in rural areas, and also found that most studies often focus on teachers' perceptions. My desire to focus on students might have led me to take a biased approach to collecting data.

I planned to manage this bias by verifying the data gathered with available data. This process is referred to as triangulation and can help to determine whether the information collected from the sampled participants is legitimate to use (Noble & Heale, 2019). Triangulation helped me to form a clearer image of the problem and increase overall confidence in the findings. To cut down on the likelihood of bias, I ensured objectivity by thoroughly analyzing the data (Noble & Heale, 2019; Symon & Cassell, 2012). I ensured that I picked participants that I had not had previous interactions with to prevent the possibility of bringing assumptions to the data analysis process.

Methodology

Participant Selection Logic

The researcher chose ten students each from five rural elementary schools. These students served as a helpful resource because they directly interacted with any technologies implemented in their schools. These students were also a beneficial choice because they represented the opinions of a larger population that the researcher might not have had access to. For the sample students, taking part in the study allowed them to

learn more about research and the potential benefits this information could have in the long run.

I used purposive sampling to determine the study's participants. Daniel (2012) noted that this sampling approach allows researchers to use their thoughts and judgment to decide who will participate in their study. This sampling approach requires researchers to have some information about their study's purpose, as this will help them effectively choose and determine the right participants. Using purposive sampling is beneficial because it allows the researcher to access a specific group of individuals. Each participant's characteristics or experiences align with the topic under study. This method can help the researcher choose a sample from a more significant population. This sampling method also helps the researcher identify students who have regularly used technology in their rural classes. As a result, purposive sampling is essential in acquiring beneficial data from the interviewed students (Daniel, 2012). As such, I selected participants based on those who have had direct interactions with technology in their schools and are well-informed on this topic.

Purposive sampling requires researchers to know about the objectives of their study to ensure they can effectively choose and find the right participants. Purposive sampling is also helpful when one wishes to access a specific section of people, as every participant in a survey is chosen because they have some desired features (Cohen et al., 2018). The data gathered from purposive sampling might not represent the larger population statistically, but it can be generalized. Purposive sampling is helpful because the researcher can eliminate students who do not fit the desired specifications. Purposive

sampling further allows researchers to acquire a large amount of information from the gathered data (Palinkas et al., 2015). It is also beneficial because researchers can structure it according to the information they wish to collect.

I selected the participants based on two criteria. First, they must study in rural elementary schools between Grades 1 and 5. Second, they must have used technology in their learning process in the last 3 months. The first 10 students from five respective rural elementary schools who met these criteria participated in the study. According to Vasileou et al. (2018), an adequate sample size must be big enough to ensure the researcher will have a deep and rich understanding of the topic, but small enough to allow for deep analysis. In studies that use interviews, 10 participants from five schools is adequate, as it enabled the researcher to effectively manage and engage in research (Emmel, 2015). In this study, 10 participants from rural elementary schools was adequate to collect the necessary data to help policymakers better understand the subject.

I identified the necessary participants by sending emails to elementary school principals in rural areas. The emails contained information on the purpose and objectives of the study and consent. Students interested in the study provided a signed consent slip from their parents and the school administration, along with an assent form signed by the students themselves. The researcher also emphasized voluntary participation. The participants were informed about the research process and made aware that taking part is a personal choice. Bos (2020) argued that informed consent is the most critical part of the research process: it is a contract with the participant where the researcher details the

research procedures, risks, possible time to be spent on the study, and the storage and access to the collected information.

I also explained that the interviewee can stop participating at any time during the process. I reassured all participants about the safety of their data. Only those students who agreed to participate in the study by having their parents sign the consent form participated in the research and the interviews.

Instrumentation

I developed eight interview questions (see Appendix) to collect data. The questions flowed from the literature on the subject and this study's theoretical and conceptual framework. My aim in developing the interview questions was to acquire information from the sampled students to answer the RQs. The interview questions concerned (a) how comfortable elementary school students in rural areas are using technology in their learning processes and (b) whether they feel using these technologies has had a permanent or significant impact on their learning.

An interview guide was helpful in encouraging students to present their opinions on the topic. According to McGrath et al. (2018), interviews can help researchers explore and review participants' thoughts and responses to collect in-depth information about their feelings and experiences. They can also provide a flexible way to collect data, as the researcher can look at the participants' facial expressions and listen to their tones.

Interviews can help researchers gather a large amount of information from a small group of people in different areas. The researcher collects data on the students' feelings, attitudes, and opinions about the topic. Interview guides also help explore the respondents

and ensure they remain on topic (Jamshed, 2014). Recording the interview helped the researcher concentrate on the questions and generate a direct transcript. Conducting an interview often means potentially asking interviewees to think about issues that might be important. The guide can also ensure the researcher has the chance to establish a comfortable environment where the interview can be conducted (McGrath et al., 2018). This way, one can acquire detailed information on the participants' experiences.

The first interview question asked what kind of technologies the student's school is using. The second interview question asked students how they use technology in their schools and how much time they spend learning. The third interview question asked whether the students felt they enjoyed learning more when they used these devices. Interview question four asked the students how well they felt their teachers taught them to use technology in class and whether they could answer questions when they had issues. Interview question five asked the students if they felt using the technology helped them save time compared to when they used traditional ways of learning. Specifically, this question asked if the students felt they better understood what they were taught in class when using technology. Interview question six asked the students what changes could support the technology they use to help them learn better. Interview question seven asked the students if they receive any help from their parents when using these technologies at home. Specifically, the question asked whether their parents give them the same advice as the teachers in school when they have issues using the technologies. Finally, the last question asked whether students had anything else they wished to say about the topic.

Procedures for Recruitment, Participation, and Data Collection

The process of recruiting participants for a research study is essential. It involves identifying the right participants, explaining the research's purpose to the participants, and determining a suitable sample based on the design and goals of the study. It also involves obtaining consent from the chosen sample and following the ethical guidelines for research. Recruitment allows researchers and participants to form an initial relationship. The researcher must use fair recruitment approaches in research to protect participants from potentially being influenced or pressured (Maxwell, 2013).

To find the relevant participants, I sent out emails to principals of random rural elementary schools that contain the objectives and expected outcomes of the research study. According to Maxwell (2013), individuals carrying out recruitment need to have adequate knowledge about the research to answer questions. Irrespective of the approach one uses to recruit, it is critical to ensure that participants provide their consent. In this case, the email also contained approval from the university to show the validity and credibility of the study. It also provided a telephone number that the principal could call to verify that the researcher has permission from the university to carry out the study.

The email also included details about the reasons for student participants and how the researcher protected the collected information. The researcher requested that the students who agreed to participate in the study come with a signed consent slip from their parents or guardians on the interview day. Providing this information increased privacy and reduced the likelihood of influence or unintended pressure. This approach was fundamental because the researcher was interviewing children; the history of researchers

taking advantage of young children when collecting data could have made parents suspicious. Allowing the principals and parents the chance to ask questions about the research's purpose allowed me to deal with this concern.

Generally, protecting confidentiality means the researcher must ensure the participants retain their anonymity throughout the study. It also means not acquiring personal information unless necessary. Confidentiality also means that the researcher must brief the participants on the research's purpose and who will access the information. The participants, through their parents, must provide permission to take part in the study throughout. There should also not be any attempt to influence the participants. As such, I also allowed participants to review the collected information and correct any mistakes.

I also created an emergency recruitment plan if the initial recruitment plan did not produce the required number of participants. Under this plan, I would have once again sent out emails to rural elementary schools and posted on social media sites such as Facebook. As I conducted the recruitment, I needed to be aware of my prejudices and biases about access to the participants and the subjects' willingness to participate in the study. Pribulick et al. (2010) suggested that the researcher should continuously educate the community—in this case, the principals and parents—throughout the study, and should avoid stereotyping by choosing subjects irrespective of race and gender. The researcher also needed to consider that the parents might require more information to continue providing informed consent through the study. The researcher believes that elementary school students were willing to participate in this study and that challenges may have occurred in collecting the information.

Students who chose to participate in the study received assurance from the researcher about the privacy of any information they gave. Bos (2020) argued that in research, the critical element of confidentiality requires the researcher to be responsible for ensuring all information collected from their participants respects their dignity. Researchers must also make sure they do not use the data to go against participants' interests. Confidentiality also refers to the understanding that forms between the participant and researcher and guarantees the researcher will handle any private or sensitive data with the highest level of care. This relationship is based on trust. The participants must be sure that the researcher will fulfill their duty and take care of them.

After completing the interviews, the researcher carried out a debriefing. According to Jackson (2015), debriefing is critical because during this process the researcher describes the reasons for the study after data collection. Debriefing is vital in every research study because it allows the participants to learn about the potential advantages of participating in the study. The researcher can also manage any anxiety or discomfort the participants might be feeling. The main aim of this step is to bring the participants back to the state they were in before the interview.

In this study, I thanked the participants for taking part in the study and left copies of the findings with the parents if they wished to learn more about the interview findings. I also asked the following questions: Did you feel bored during the discussion? What do you think I could have done to make you more excited about participating in the process? Did you find the questions too long or too short? Did you feel comfortable answering the questions? Did you think I gave everyone enough time to answer? These questions

allowed me to determine how well I did as I led the focus group. I then thanked the participants for participating in the study.

Data Collection Technique

The process of collecting data began after the students provided their consent slips when they came into the interview. I conducted the interviews through Skype, Zoom, or phone, depending on the respondents' availability and the school calendar. As Paradis et al. (2016) specified, interviews can help gather data. The researcher can speak to the sampled respondents one-on-one using several questions that the researcher has already determined or a set of specific questions focusing on different interest areas. Another advantage is that interviews can be unstructured or structured and can follow a tight script like a survey or have loosely set questions that encourage the interviewees to speak freely. There is a potential for this process to be time-consuming (Paradis et al., 2016). Moreover, the interviewer will have to actively question, listen, and push the interviewees to give more information, which might cause them to provide answers they feel the interviewer wants to hear.

Each interview lasted around 20 min and, if held in-person, was held in an empty classroom to ensure privacy and reduce the potential for interruption. The researcher recorded each interview session and asked for consent before each session. Each respondent answered a similar set of questions appropriate to that respondent's age. The researcher used open-ended questions and encourage respondents to be as honest as possible and provide their point of view without being afraid. Ponizovsky-Bergelson et al. (2019) point out that interviews with children can be challenging and complicated.

Because of the power relationship between adults and children, most children often see questions posed by adults as tests meant to examine their knowledge instead of a desire by the adult to truly listen. They might wish to please the adult by answering what they believe to be the right questions even if they have a contrary opinion. The one-to-one approach helped children relax and potentially encouraged them to speak openly about technology in their schools. Once the interview ended, I thanked each interviewee and informed them that they could look at the responses to make sure what was recorded was what they meant to say. At the end of this interview, I gave the participants the chance to give additional information.

Throughout the interview, I made notes to help recall the respondents' answers and any thoughts they might have had (Paradis et al., 2016). I transcribed each interview in the exact words the respondents spoke and used numbers to represent the respondents to protect their privacy and the collected information. The collected data from the interviews was kept in a single password-protected computer that only I accessed. Handwritten notes on the interviewees' answers were kept in a securely locked desk at my home.

Data Analysis Plan

I used thematic analysis to examine the information gathered from the interviews. This approach attempts to identify specific theme patterns within the collected data. Thematic analysis is beneficial because of its flexibility, and researchers can use it when they are unsure of the patterns they are looking for and when searching for a particular theme (Adu, 2019). Step 1 involved familiarizing and understanding the collected

information. This step included transcribing the data and taking notes. It also involved developing initial themes that describe the study's content.

Step 2 involved assigning specific codes to the information. A code refers to a short description of what the respondents spoke about during the interview. During this step, I noted exciting elements within the data to organize the information into essential groups. The code chosen in this case depended on what the respondent said and the purpose of the research (see Adu, 2019). I assigned these codes using NVivo, and it was critical to create codes for as many themes as possible.

Step 3 involved looking for different themes, which allowed the researcher to engage in more active and deeper analysis of the data and the codes in Step 2. The researcher began by examining the categories of codes and trying to align them into broader themes that state an exciting idea. Searching for these themes is a repetitive process that involved moving the codes to try and create different themes (Adu, 2019). During this process, some themes emerged as subthemes, while some codes did not fit in with other types of codes. One must retain all the codes because they might become relevant at a later part of the analysis process.

Step 4 involved reviewing the different themes identified in the third step. Here, the researcher looked at the various extracts linked to the codes to determine whether they align, have inconsistencies, or if some themes overlap (Adu, 2019). If the researcher notes numerous contradictions within a given theme or if the theme is too broad, the theme should be split into isolated ideas. The researcher could also consider moving some of these codes into a theme into a better category. This process will continue until

the researcher has a set of distinct and clear themes (Adu, 2019). The researcher then read through the data a second time and thought about the extent to which these themes reflect the perspectives noted in the interview. This process revealed new points of view.

Step 5 involved describing and naming the identified themes. These names must be exciting and engaging, and the description includes more than outlining the theme and what makes the theme interesting (Adu, 2019). In describing the idea, the researcher had the chance to identify the story the theme seeks to tell and its relation to other concepts within the subject. Step 6, the final step, provides the reader with adequate information on the topic. It also gives the reader a process with which to examine the overall quality of the research (Aud, 2019). In this research, the themes were supported with quotations from the interviewees.

Issues of Trustworthiness

One way to protect the integrity of the study is by following the specific guidelines presented by the Internal Board Review for collecting data from human subjects, in which the researcher will establish a relationship with the school and the students based on respect and care (Woodgate et al., 2017). In this study, I also ensured that the power relationship with children was balanced, allowing them to speak about their thoughts on the use of technology in their schools. I also acquired consent from the participants' parents by asking the principal to forward the email with information on the study's purpose and expected objectives.

The children's age made it unlikely that they would fully understand the nature or purpose of the research, its potential advantages and risks, and that they could stop

anytime they wished without fear of punishment (Cane & Broome, 2017). The consent from parents was necessary because cultural aspects could have influenced the children's understanding of data. I also reported the respondents' answers exactly as spoken during the interview (Woodgate et al., 2017) and protected the integrity and credibility of the study by citing all of the sources used in the background research for the study.

Summary

In this chapter, I presented the main approaches and strategies that I used to gather the necessary information to examine the RQs. The chapter included discussion of the research rationale and design, focusing on grounded theory, ethnography, and phenomenology. These approaches were critical in understanding students' thoughts on using technology in rural elementary schools. I also discussed the specific methodology used, including the processes of choosing participants, instrumentation, data collection, and analysis. Finally, I discussed strategies to protect the study's credibility by emphasizing informed consent and creating an open environment for the respondents to express their opinions on the subject. Chapter 5 will include the results of this study.

Chapter 4: Results

The findings from the interviews conducted with students are presented in this chapter. In recent times, the use of technology in education has grown increasingly popular, with educators viewing technology implementation in classroom settings as a top priority. Technology has emerged as an important tool for achieving equitable learning and improving students' efficiency (Haleem et al., 2022; Lacka et al., 2021). The research focused on determining rural school students' perceptions of technology, and the specific questions answered through the interviews focused on determining how students in rural elementary schools perceive the use of technology in education and how those students perceive the quality of the teaching–learning process when using or mediating technological resources. The results chapter presents an overview of the study methods applied, including the data collection process and the findings from the interviews. The findings are broken down into thematic areas that address the RQs.

Data Collection

All of the data for the study were collected through interviews. Since all participants in the study were children in Grades 1 to 5, parental and administrative consent was sought before the interviews. All interviews were conducted in accordance with the plan initially proposed. The interviews were conducted via Skype, phone, or Zoom depending on the participants' preferences and their availability. All interviews were audio recorded for later transcription and analysis. Each interview lasted 20 min, and the same interview guides were used for all participants to ensure consistency in the data collection approach and to sufficiently limit the scope of the interviews to ensure

saturation. By using open-ended questions, it was possible to obtain deep and detailed responses from the participants. The one-to-one approach used in the interview process ensured that the participants were adequately comfortable, and, therefore, free to engage in the study. The transcribed interview responses were then analyzed thematically, with emphasis on the codes and themes obtained from the data.

Results

The results obtained from the interviews can be presented in three different themes: consultation, speed of learning, and impacts of technology on learning. In the theme of speed of learning, the subthemes include impacts of specific technologies, faster learning, and technology slowdown. The theme of consultation is further broken down into two subthemes: in-class consultation and out-of-school consultation. The theme of impacts of technology on learning includes three subthemes: games, educational impacts, and technology time. These themes were developed from the codes drawn from the nine participants' responses to the different questions. The results section describes the themes obtained in further detail, complete with the verbatim reports from the individual participants.

A majority of the participants reported that they used computers in their schools, with seven out of nine participants specifically mentioning Chromebooks, while only one participant mentioned not knowing the specific type of computer used in the school. Additionally, three students also mentioned the use of smart boards as part of their classroom technologies. For instance, P5 stated that they "use smart boards for the teacher to write on the board. And then they give us questions to do and for our

computers I believe Chromebooks." Despite the differences in the specific types of computers used by the students, the experiences are largely the same across all of the other thematic areas.

Theme 1: Speed of Learning

The first subtheme that emerged in the theme of speed of learning was the impacts of specific technologies. Educational technology integration aims to improve educational spaces' processing and operational speed. The interview method required students to discuss their perceptions of technology enhancing their learning speed together with supporting evidence. Students gave multiple responses about technology's effects on learning that organizationally fall under three categories: particular technological influences, higher learning rates, and technological speed reductions.

From the responses, it is evident that some of the participants felt that the use of specific technologies enhanced their speed of learning. For instance, P3 reported that "I think it makes me a faster worker because during our Chromebook sessions, we get to go on this one app called typing.com that helps me learn and then read then figure out my faster skills on my computer." This response indicates that while technology may have distinctive impacts on students, the inclusion of specific technologies can enhance the learning experience. For this reason, educators should carefully review the web-based applications that they allow in educational technology to determine whether students actually learn and at what rate.

The majority of participants mentioned that they felt that technologies in the classroom increased their speed of learning for various reasons. Participants P2, P7, P4,

and P9 all agreed that technology allowed them to learn faster. While P2 responded with a simple "yes," P9 stated that learning is "faster on the computer." Comparatively, P7 indicated that "I think it does cause like whenever I get a round it teaches us from our mistake." P7's statement suggests that the way in which technology improves the speed of learning is such that the assessment and feedback method is rapid, and the students easily learn from the mistakes they make, hastening their learning process. This perspective is understandable since conventional formative assessments entail waiting for the educator to give feedback on students' performance, which can take time and slow down the learning process. According to D'Angelo (2018), students who feel that technology is likely to be beneficial to them are more likely to be engaged in technology use and benefit from it. As such, it can be deduced that the students who confirmed that technology made it faster to learn were mostly those who already had a positive attitude to technology and the associated features. The participants confirmed that with a supportive teacher, the technologies make the learning process faster and more effective.

The other subtheme is that of technology slowdown, wherein some of the participants felt that using technology in the classroom slowed down the learning process. This perspective was shared mainly by students who perceived the use of technology to be limiting, especially since they still had to involve the teacher in the consultative process. For instance, P1 said, "I don't think using technology makes me a faster learner. I can ask my teacher questions when she give us the directions." For P8, the question as to whether he felt that technology improved the speed of learning was answered with "yes, um no," indicating lack of clarity on the impacts of technology on his speed of

learning. P5, on the other hand, gave the impression that technology was more of a hindrance than a support tool for learning: “Um so when we’re using the device in the class I don’t feel like I take as much in because first I learn by speaking and having conversations but I can’t do that if I’m on a computer. Because a computer doesn’t know my level, doesn’t know my skills.” This response gives a holistic view into specific ways in which the computer can hinder learning, including through the absence of collaborative discussions, a lack of a personalized learning experience that considers students’ strengths and weakness, and limitations in what can be consumed (Harris, 2016; Rashid & Asghar, 2016). Reviewing these responses, it is possible to identify areas in which teachers can augment technology utilization in the classroom as well as the need to use complementary teaching strategies for different categories of learners.

Educational technology integration aims to improve educational spaces’ processing and operational speed. The interview method required students to discuss their perception of how technology enhanced their learning speed together with supporting evidence. Students gave multiple responses about technology’s effects on learning that organizationally fall under three categories: particular technological influences, higher learning rates, and technological speed reductions.

The students had different degrees of appreciation for technological educational resources, and many doubted whether educational technology increased their pace of learning effectively. P1 indicated that technological use does not lead to increased learning speed by saying, “I can approach my teacher for clarification about the assignments she provides when directions and instructions start.” There exists a belief

that conventional teaching approaches hold educational value for various students. Technology sometimes stretches learning durations due to required teacher involvement during clarification sessions according to a limited number of participants. The theme demonstrates how technology needs to be combined with different teaching approaches that meet unique learning abilities.

Theme 2: Consultation

The theme of consultation in relation to the use of technology in the classroom environment largely answered the question as to whether the students required additional resources when using technology in their classrooms. During the interviews, students revealed their procedures for obtaining assistance while dealing with technological difficulties. Almost all of the participants indicated that they depended on teachers and classmates when they needed help, with all nine participants contacting their teachers to solve their problems in class. P9 explained that he approaches the teacher and his classmates when he needs help with queries. Teachers maintain essential positions in technology implementation in education because they serve as facilitators of effective technology integration.

All nine participants mentioned that regarding in-class consultation, in response to the question about what they do in case they face challenges in the use of technology within the classroom, all of their questions went to teachers if necessary. Only one of the participants, P5, mentioned that when in the classroom, they first consult their peers before reaching out to teachers, specifically stating that, “I would ask one of my classmates and then if they didn’t know I would ask the teacher.” The participant

responses point to high levels of trust for the teacher and limited peer collaboration within the classroom setting.

Regarding out-of-school consultation, students were asked whether they were also able to ask their parents questions related to technology use if necessary. While all of the participants mentioned that they were not allowed to carry their computers home, one of them (P8) mentioned having a personal computer at home. Most of the participants also stated that, if necessary, they would be able to ask their parents questions related to technology. However, it was noted that most participants responded to this question with a lack of clarity, pointing to possible confusion among the participants. It is evident that while participants trust their parents/guardians, it is difficult for them to predict whether they would ask for technology-related help from them, especially because they do not have the flexibility of carrying the same technologies home. The implication of this finding is that it is difficult to predict the impacts of the disparity in technology use knowledge between parents and teachers on students' perceptions of technology use in the classroom.

The practice of consultation spread into areas beyond school limits. Most students revealed that home assistance for their device-based homework tasks came with little to no help from their parents. P4 noted that they only listen during class because they strictly obey teacher directions. Students lacked parental involvement since some parents blocked device usage or felt unskilled in handling new technologies. As such, it is recommended that institutions offer proper equipment and educational programs to support educators and guardians as they help students develop technical expertise.

Theme 3: Impacts of Technology on Learning

The third substantial study theme analyzed wider technology-driven impacts on educational student experiences. The category contains three subthemes regarding educational effects, and students' time spent with technology. These elements demonstrate how technology impacts three key areas of student learning: engagement with materials and subjects, the resultant satisfaction from this process, and the academic achievement that results.

Most of the students who mentioned that they experienced a lot of fun learning with technologies cited games as the reason for their fun. For example, P2 enjoyed learning using technology "because we can play games on it." The same perspective was shared by P7, who stated that, "when we learn we do mini games at the end, and it teaches us at the same time." P9 stated that, "I want them to have iPads from Apple, they can still have computers for i-Ready, but iPads to play games." P9's response was in answer to a question regarding what he would want the school to implement with regards to technology use in the classroom. In contrast, some of the participants also mentioned that they did not find technology fun for various reasons: for instance, P1 stated: "I think using technology is not fun because I like to learn when the teacher teach us." This response has more to do with personal preferences than the actual technology characteristics. Contrastingly, P5 indicated that technology use is not fun because it hurts his head and he would prefer that the teacher taught them instead of the computer, also pointing to personal preferences.

Participants also mentioned the educational impacts of technology, which were attributed to specific applications. Some of the participants mentioned specific technology tools that encouraged learning, while others mentioned the impacts of technology on learning in general. P4, for instance, mentioned liking technology in the classroom "because we can play studying games like Kahoot and Blooket." P3 stated that "I feel it's funner because during class time we get to learn uh we get to learn on our Chromebooks instead of using tests and we get to do our STARS testing on our Chromebooks while we do our different classes while we switch for each 30 minutes to a half an hour." A similar perspective was shared by P9, who stated that "I do this thing called i-Ready and it has learning games. I learn about math and reading," as well as by P6, whose statement was rather simple: "cause it's educational. It gives me like a joy of some sort." These statements confirm that for each of the students, there is a specific element of technology use that creates a sense of excitement and fun.

Among the students, an observed concern related to technology use in the classroom was the time spent with technologies. Students reported using technology for periods ranging from 10 minutes per lesson to more than 6 hours per day. Interestingly, students who reported spending the longest amount of class time using technology were also most likely to report negative impacts of technology use, while those who spent the shortest time with technology wished for more time and reported having fun with technology in the classroom. For instance, P5 reported spending "probably 6 hours most of the day because most of our classes we need our computers um for research and for other stuff." P5 subsequently recommended that the school should limit time spent on

computers, as it negatively affected interpersonal interactions and collaboration among students and resulted in headaches. In contrast, P8 reported spending only 20 min daily on the computer and recommended that he would like to "be able to do whatever I want when we are on the computers," which shows a desire for flexibility in technology use. These findings support evidence from Carstens et al. (2021), who report that overreliance on technology as a learning tool can cause negative impacts on learning outcomes. Only P1 reported spending only 10 minutes per lesson using technology yet wanting less time with technology. Further examination could reveal the rationale for P1's argument and help educators in designing appropriate technology use timelines and areas of focus for students.

The enjoyment of technology as a learning tool varied among participants, with not all of them having positive reactions: for example, P6 expressed that technology does not add any enjoyment to the learning experience. Students reacted neutrally to technology in education, demonstrating that technology benefits some types of learning but fails to engage every student. The participants showed anxiety regarding how long they spent looking at their screens, with P3 stating they spent 70 min in front of the Chromebook daily, which raised doubt about proper time management for digital versus nondigital tasks.

Brushing up on educational outcomes represented another significant topic discovered within participant interviews. Students indicated better information learning outcomes after incorporating devices into their educational process, with P8 reporting better comprehension levels from instruction through technological devices. Others,

however, argued that excessively relying on technology may hinder traditional skills development: P3 warned that excessive computer usage would remove the need to understand traditional real-life work tasks. Technology integration must be planned to promote fundamental teaching practices; otherwise, core foundational principles could potentially suffer.

Summary

In this chapter, I highlighted the study results, which encompassed participating students' perspectives regarding technology use in the classroom. The findings center on three themes: namely, speed of learning, consultation, and impacts of technology on learning. Each of these themes included at least two separate subthemes, which were described in the text. Participants viewed technology as a valuable teaching instrument yet acknowledged its imperfect nature when used for classroom learning. Key insights included the following:

1. Technology exponentially sped up the learning curve for several students, and not only due to adaptive apps and instant feedback mechanisms. A minority among students preferred established learning approaches and experienced reluctance within their capacity to use technology tools effectively.
2. Students needed direct instruction from teachers for technical assistance, but peer-based help effectively supports technology learning. Limited access to devices at home most likely explained why parents showed minimal engagement.

3. Gamification and customization increased engagement by making the quizzes more engaging. However, not all students were inherently enamored by all technology. Students faced two major issues with long amounts of screen consumption time and fear of dependence on digital sources.
4. Students supported more liberties in using devices while also keeping in mind that there is a balance between digital and traditional approaches. Excellent technological devices with enhanced accessibility must become operational recommendations, according to the research findings.

In Chapter 5, I interpret the findings. The chapter also includes discussion of the study limitations, recommendations for further research, and consideration of the study's implications for practice and positive social change.

Chapter 5: Discussion, Conclusions, and Recommendations

In this chapter, I present the conclusions I drew from the study findings. In the previous chapters, the research methods and underlying literature review were presented, followed by a description of the results of the study. This chapter includes interpretation of the findings, the implications and limitations of the study, and recommendations for further research.

Interpretation of the Findings

The study findings were effective in answering the RQs, as they gave interesting insights into students' perspectives about the use of technology in education. Notably, the findings showed that students have varying perspectives about technology use in the classroom. While a majority of participants had positive perspectives on the use of technology in the classroom due to its impacts on learning and the speed of learning, others felt that technology in the classroom slowed down their learning process and contributes negatively to the fun of learning. However, it was determined that the differences in perspectives are mostly attributable to differences in actual classroom technologies as well as to the total time spent with technology in the classroom. The quality of the teaching–learning process was also perceived differently by students, with some participants feeling that technology improved the quality of learning through specific applications that foster understanding, while others felt that technology reduces the quality of the teaching–learning process. These findings corroborated evidence from a broad range of literature on the impacts of technology in the classroom.

This chapter synthesizes the findings of Chapter 4 and interprets their implications for educational practice; based on these interpretations, recommendations are made that relate to the insights generated from the interviews. The chapter will discuss how the themes of speed of learning, consultation, accessibility, engagement, and recommendations for supporting technology integration in rural elementary schools connect to the existing literature on classroom learning for elementary school social studies. The study limitations will also be discussed, and future research directions proposed. Results from the student interviews were useful in understanding how the participants perceive technology use in the classroom.

Stakeholder Theory

I drew from stakeholder theory (Harrison et al., 2015; Langrafe et al., 2020) to conceptualize rural students whose perspectives should influence ed-tech design, as important stakeholders instead of passive consumers of technology. A major part of the literature has been focused on infrastructure or teacher education, and little has been written regarding the student perspective. The speed of learning, support system, engagement, and accessibility have all been described as connected aspects of the stakeholder experience, which is then put into context with current literature to explore and expand on or refute new insights into the role of technology in rural education.

Theme 1: The Paradox of Speed: Efficiency vs. Alienation

Students' perceptions of the speed of learning were not static. They were also clearly contextualized, affected by pedagogical design and an individual student's learning preferences. Participants such as P3 were able to develop their skills faster with

adaptive delivery modes such as typing.com, similar to findings by D'Angelo (2018), who found that when technology is used in a personalized experience with feedback, it could increase the speed of learning. Similarly, P7 said that technology "teaches us to learn from our mistakes," and this aligns with the conclusion of Rashid and Asghar (2016) that offers immediate, iterative feedback loops to support self-directed learning and academic momentum.

On the other hand, the efficiency narrative was contradicted by participants such as P1 and P5, who rejected the notion of technology accelerating learning outright. P5's statement of, "a computer doesn't know my level, doesn't know my skills" suggests there is a problem with the current applications of this technology. Technology, whether unmediated or inadaptable, can inhibit learning instead of expediting it. It undermines techno-optimistic assumptions referred to in the literature concerning learning with technology by querying the caution given by Harris (2016). In cases that do not integrate appropriate productive technology in learning instances, there will be cognitive overload and disengagement for learners who benefit from time to read and who learn relationally with verbal instructions through participatory classroom pedagogies.

In principle, this duality emphasizes one of the key assumptions of stakeholder theory: Students are not only passive receivers but also evaluators of what is useful to them, and using technology without taking into account the different learning styles or developmental needs of students does not meet one of the premises of stakeholder responsiveness (Langrafe et al., 2020). Consequently, speed of learning can no longer be solely seen as an interaction with devices, but also as learners' experiences of the

pedagogy. Schools must move forward from one-size-fits-all digital tools and provide more differentiated pathways that encourage students to navigate between digital devices and analog modalities based on task, choice, and need.

Theme 2: The Fractured Support Ecosystem: Teachers as Lifelines, Parents as Absentees

The consultation theme revealed a consistency in the dependence on teachers as the main technical and pedagogical support. All nine participants described seeking teachers first in times of difficulty. P9 reiterated that "if I have questions, I usually ask the teacher or students." This finding provides strong support for Mustafa et al.'s (2024) finding that teacher mediation was vital to the adoption of technology, especially in resource-poor contexts. Notably, peer support also emerged as a secondary but valuable resource, with P5 indicating a preference to "ask classmates first," reflecting Mustafa et al.'s (2024) insight that technology can organically foster collaborative learning networks.

In stark contrast, parental involvement was virtually absent. Despite P8's access to a home computer, most students reported being unable to take school devices home, and none described receiving meaningful technological guidance from parents. This gap is significant. While literature often presumes parental engagement as a normative support structure (Tyler-Wood et al., 2018; Wang, 2013), this study exposed a rural-specific reality: structural barriers, policy restrictions on device lending, limited home internet, and low parental tech-literacy effectively exclude families from the learning ecosystem.

From a stakeholder theory perspective, this exclusion is ethically and pedagogically problematic. Parents are legitimate stakeholders whose absence from the support chain diminishes student autonomy and reinforces institutional dependency (Harrison et al., 2015). This finding calls for a reimagining of stakeholder inclusion: schools must not only provide devices but also build bridges to the home through parent workshops, SMS-based tech guides, and community lending libraries. Without such efforts, technology integration remains incomplete and inequitable.

Theme 3: Accessibility as Equity

An absolute result was found concerning accessibility. Most students, by far, reported that they were not allowed to bring these machines home—P6's comment that "We cannot bring our computers home" not only points to a very real structural issue that may cost the school a lot, but also to a very real consequence. This did not exist in the same space as Wang's (2013) concept of just access and the explanation by Tyler-Wood et al. (2018) of rural students having to grapple with a so-called digital divide; it disrupted a seamless experience of learning at home and school and in reverse. P5 also reported headaches and loneliness as a result of spending 6 hr online, which is consistent with the results of Carstens et al. (2021) on the physiological and cognitive cost of excessive technology or screen time devoid of balance and proper breaks.

This is a sharp contrast to the sometimes-believed role in research that technology is believed to be an equalizer (Islam et al., 2024). Technology will never close the gaps, but in rural situations, families might have minimal access to a home, patchy connectivity, and devices that never get fixed and may essentially be obsolete anyway.

Not only is this bad planning, but stakeholder theory (Langrafe et al., 2020) manifests this as an ethical failure: students and families are not involved in the processes that affect important decisions about their learning and well-being. The same politicians, school leaders, and funders champion the idea of device supports yet fail to consider the equally essential support systems surrounding connectivity, repair, and take-home access, which will bring actual utility to technology use and fairness to rural learners.

Theme 4: The Myth of Universal Fun: Gamification's Limits and the Primacy of Preference

Engagement emerged as a highly subjective and design-dependent outcome. Students who reported enjoyment consistently cited gamified elements, P2's delight in "play[ing] games on it," P7's appreciation for "mini games at the end," and even his customization of wallpapers ("it makes it fun"), all point to the motivational power of interactivity and personalization. These findings align with Ubaidillah et al. (2020), who found that gamified learning increases intrinsic motivation through reward, challenge, and aesthetic control. Ashfaq's (2025) emphasis on personalization as a driver of engagement is further validated by P7's comment, suggesting that even minor customization features can significantly enhance perceived value.

Yet not all students shared this enthusiasm. P6's blunt declaration, "It doesn't make me fun," and P1's preference for teacher-led instruction reveal that engagement is not inherent in technology but coconstructed through pedagogy and preference (Kirkwood & Price, 2014). This contrasts with the prevailing view in the literature (most

notably in Heflin et al., 2017), which suggests that all students have an inherent preference for using digital tools.

Synthesis: Toward a Stakeholder-Centered Model of Rural Educational Technology Integration

Future efforts must be codesigned with students, not imposed upon them. As Langrafe et al. (2020) argued, stakeholder value is created not through top-down mandates but through inclusive, iterative dialogue. Only then can technology fulfill its promise, not as a tool of efficiency, but as an instrument of empowerment, equity, and authentic learning.

Collectively, these findings reveal that students' perceptions of technology are not shaped by devices alone, but by how those tools are embedded within their daily learning ecosystems. When technology is personalized, adapting to individual paces and styles, students like P3 report accelerated learning, echoing D'Angelo (2018). When socially supported by teachers and peers, frustration diminishes, aligning with Mustafa et al. (2024). Gamified and customizable features, as noted by P2 and P7, boost motivation, reinforcing Ubaidillah et al. (2020). Accessibility beyond school walls, as Wang (2013) emphasizes, deepens utility and continuity of learning.

Conversely, when technology is impersonal, unsupported, overused, or restricted, it becomes a barrier. P1's lament, "a computer doesn't know my level," and P5's headaches after 6 screen hr reflect Harris's (2016) warnings on cognitive overload and Carstens et al.'s (2021) cautions on physical strain. These contradictions extend stakeholder theory: student agency depends not just on pedagogy, but also on structural

conditions, equitable access, parental inclusion, balanced usage. Ignoring any layer fractures the ecosystem. True integration must be codesigned with students, grounded in rural realities, and ethically responsive to their lived experiences.

Speed of Learning

One of the most significant outcomes of the study was that technology has a mixed effect on students' learning speed. On the other hand, while a few participants noted that technology made learning concepts faster, especially through adaptive apps such as typing.com, others doubted that the technology was more effective than traditional teaching methods. For example, P3 stated that touch and specific applications helped them to quickly improve their typing skills, whereas P1 stated that they prefer verbal interactions but otherwise prefer digital tools: "a computer doesn't know my level or skills." Such a dichotomy, however, demonstrates that technological intervention fits well with the individual learning style.

Existing literature supports these findings. Rashid and Asghar (2016) found that if technology helps students learn for themselves, it can improve their academic performance, but this is not for all students. D'Angelo (2018) suggested that while technology is engaged, it is not enough to distract people from social interactions, so it is the teacher's job to find the balance between using technology and keeping connections between people on the interpersonal level in classrooms.

There is a great variability in how participants responded to technology; as such, we need to develop personalized approaches to consider integrating technology in the classroom in the first place. In this respect, schools should offer differentiated instruction;

for instance, students can be given a choice between using digital or nondigital resources depending on their preferences and needs. This flexibility ensures that no learner is left behind or bound to any particular tool while benefitting from the tools available.

Consultation and Support Systems

A second theme essential to this study was how students handle challenges when dealing with devices. Participants consistently mentioned they had relied on teachers as principal sources of support and, later on, the peers. P9 also noted educators' role in fixing technical issues or explaining instructions: "If I have questions, I usually ask the teacher or students." Another point is peer collaboration, where one interviewee (P5) mentioned that other students often asked each other for help before approaching teachers.

These results are consistent with research showing that modern classrooms are collaborative. According to Mustafa et al. (2024), technology has the role of creating social networks that promote knowledge sharing among students, leading to collective learning outcomes. While parents are reported to be involved in homework tasks in supportive ways, their limited involvement in supporting homework tasks may raise concerns about equity and access. Due to policy restrictions, several participants reported not using school devices at home, and many utilized solely school-based guidance. Lack of continuity with technology outside classroom hours can lead to a wider digital divide and may include the students of families with low income who do not own personal devices. In considering this gap, school leaders could consider hybrid models that permit a controlled device take-home program. Furthermore, training sessions for parents to help

their children beyond the traditional institutional boundaries of learning technologies should be provided.

Accessibility and Usage Patterns

A commonly referenced challenge was restricted access to devices within the home. Almost all participants stated that they could not bring the Chromebooks or tablets home after school due to the lack of availability. “We can’t bring our computers home,” one participant (P6) elaborated, while another (P7) added, “I don’t take it home.” Limitations such as these stymie the ability to have extended practice and reify the inherent disparities surrounding resource availability.

Equitable access is essential to technology-enhanced education to maximize the benefits of that technology. If students are not getting consistent exposure to devices, they cannot continue to practice recently learned skills and explore creative uses for the technology. In addition, limited access discourages parent engagement in the study process, as illustrated by most participants affirming that family members seldom intervened in assisting with homework that involved the use of technology. School leaders could adopt initiatives to overcome this gap by creating lending libraries for devices, or by partnering with local organizations to subsidize internet connectivity for disadvantaged families. This could help to address structural barriers and guarantee that every child has the availability of equal opportunities to excel academically.

Engagement and Enjoyment

Students greatly enjoyed their lessons with technology, as the educational platforms embedded gamification elements. Key points for many participants included

enjoying minigames and customization features. For instance, one participant (P2) noted that, “at the end of when we're learning, we do minigames, and it teaches us simultaneously.” P7 also noted that he appreciated being able to change wallpapers and that “it makes it fun.”

This coincides with the findings of Ubaidillah et al. (2020), in which a gamified learning environment has high motivational power. Educators incorporating playful elements into their instructional design can keep students interested and encourage active participation. However, not every student experienced technology engagement by default, with P6 stating bluntly that, “It doesn’t make me fun.” These attitudes make it obvious that instructional strategies must be diversified to accommodate student tastes. Future implementation should involve designing curricula that can be inclusive and include a mixture of entertainment and meaningful content delivery. Maintaining high levels of student motivation without losing educational rigor will provide a balance between novelty and educating rigor.

Suggestions for Improvement

Feedback from the participants was also constructive toward potential improvements of current practices. One common suggestion was to allow students more control over device use, with P8 offering that, “I want to be allowed to do whatever I wish to do while we are on the computers.” Some participants raved in favor of meditating and using technology, while others only preached moderation, warning against too much technology. This quote from P3 explains it best: “If I used more

computers, we wouldn't be asking ourselves what kind of real work we'd need to do upfront in the real world."

These perspectives mirror those of previous scholars Haleem et al. (2022), who raised questions on the sole race with technology and neglected basic competencies. Thus, schools should adopt balanced approaches that blend digital and traditional methodologies. Additionally, purchasing better equipment could eliminate the exasperation caused by malfunctioning equipment. For instance, P7 casually stated that he owned a broken computer at home, and his overall satisfaction with technology may have increased if his school included a maintenance policy. Updates should occur regularly, and repairs should be made promptly to show that resources are reliable and meet the users' expectations.

Limitations of the Study

This study had several limitations. First, data collection involved only qualitative interviews, ruling out quantitative analysis to determine statistical trends. Moving forward, data triangulation of multiple data sources—including surveys and observational records—would increase the validity of claims. In addition, the reliance on young students in Grades 1 to 5 who may be unable to effectively describe their perceptions may have negatively impacted the quality of the data collected in the study. These students are also likely to face challenges in describing their experiences with technology and may not be sufficiently persuasive in their speaking or understanding of technological concepts. Including older students in a future study could help to obtain clearer information that would answer the RQs more effectively. Last, outcomes may

differ depending on the contextual factors specific to rural settings relative to their urban counterparts. Similar studies in metropolitan regions would test whether nuanced distinctions in studies that demand specific recommendations exist.

Recommendations

Markedly, the findings from this study called for moderation in the use of technology in the classroom. Technology can have positive implications on the teaching–learning process if used effectively, especially if the total time spent on technology in the classroom is low. Teachers should therefore ensure that they do not allow students to spend too much time using technology and that they combine technology with other approaches to teaching and learning. Based on the study findings, I offer the following suggestions:

1. Allocate the students along personalized learning pathways to toggle between digital and analogue resources according to their inclinations.
2. Offer workshops educating parents on how to use educational technologies to help eliminate parental barriers to accessing such technologies for their children when they transition from school to home.
3. Initiate equitable access initiatives such as lending libraries or subsidized Wi-Fi programs to increase the usage of devices beyond classroom hours.
4. Balance gamified modules with rigorous academic exercises to ensure maximum engagement and depth of learning.
5. Perform continuous monitoring based on evaluating the effectiveness of the adopted measures and modifying protocols if necessary.

Implications

This study has implications for elementary school teachers using technology as a tool to encourage learning. The findings showed that students can perceive technology differently in the classroom depending on their individual experiences with technology. As educators, it is the role of teachers to control the degree of technology exposure among students and define the effects of such exposure.

The results of this study had significant implications for stakeholders seeking to use technology to improve educational quality. Policymakers must first recognize the diversity of students' experiences and shape interventions accordingly. Universal solutions can exclude population segments whose needs do not concern the majority. Second, professional development programs geared toward teachers should aim to help teachers develop their expertise in pedagogical and digital literacy. Blended learning environments become more manageable with a highly skilled educator.

Third and finally, partnerships with communities are underexploited reservoirs of support. By rounding out the program, local businesses, nonprofits, and government agencies can engage in creating possible initiatives related to funding projects that lead to sustainable progress toward closing the digital divide. Lastly, longitudinal assessments are necessary to validate general claims that technology adoption has such positive effects. This will help in the iterative refinement of strategies that are aligned with the ever-changing needs of society over time.

Conclusion

This study provides insight on the relationship between technology and learning in rural elementary schools. Participants acknowledged many advantages of using digital tools but also pointed out problems that remain and present substantial ongoing issues. Through learning about these insights and adopting evidence-based practices, educators and administrators can birth transformational learning environments for tomorrow's leaders today. This study effectively answered the RQs on what students in rural elementary schools think about technology inclusion in the classroom by collecting data using interviews conducted with children in Grades 1–5 in rural elementary schools. The findings showed that students have mixed perspectives regarding technology use in the classroom. While some students felt that technology use in the classroom had positive impacts on learning, others felt that the impacts are more negative. This study had limitations due to the characteristics of the participants, and as such, it is recommended that future studies should include older students as participants.

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Appendix: Interview Questions

1. What kind of technology is your school using?

   (Probe: What kind of devices do you use?)

2. How do you use the technological devices the teachers give you at school? How much time do you think you spend on them?

   (Probe: If you do not use these devices, would you like to have them and use them?)

3. Do you feel learning is more fun when you use technology in class? Why?

   (Probe: Can you tell me what you do with tablets or computers in class that makes it more fun to learn?)

4. Do you feel your teacher helped you and has been there when you had questions about using the technology? How did your teacher help you?

   (Probe: Can you tell me if a teacher got angry or refused to help you when your device did not work?)

5. Do you think using technology made you a faster learner? Why?

   (Probe: do you think you understand and take in more in class when you use the devices than when you do not?)

6. What do you feel the school should change to make these devices better? Why?

   (Probe: For example, do you want more computers to use?)

7. When you go home with homework on the devices, do your parents help you when you have a problem with the machine? Why?

(Probe: Do you think your parents give you the same advice in using the devices that your teachers do? Do you feel confused when you use the machines at school compared to at home?)

8. Is there anything else you would like to tell me about technology and learning at your school?