

**Assessing the Digital Divide in Title 1 and non-Title 1 through infrastructure, support,
barriers, and technology use in South Alabama Secondary Schools**

by

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Digital Divide, technology, low income, minority schools, Title I, infrastructure

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Abstract

This study examined the digital divide in secondary education by investigating differences in technological access, perceived barriers, and frequency of technology use among teachers in Title I and non–Title I schools in South Alabama. Grounded in Jan van Dijk’s Digital Divide Framework, the study explored how disparities in access, barriers, and usage patterns contribute to inequities in educational technology integration.

A quantitative research design was employed using survey data collected from 102 secondary teachers across 11 schools. The instrument was adapted from the School Technology Needs Assessment (STNA) and included measures of infrastructure and staff support, teacher-perceived barriers, frequency of technology use, and demographic variables. Data was analyzed using descriptive statistics, chi-square tests, one-way ANOVA, and logistic regression.

The findings revealed that there were selective differences in technological access based on school context, with non–Title I schools reporting greater access to certain resources. However, not all access variables differed significantly, indicating that disparities were present but not consistent across all areas. The most commonly reported barriers included limited funding, time constraints, and limited student digital literacy. No statistically significant differences in barrier reporting were found between Title I and non–Title I schools, and teacher demographics did not significantly predict the likelihood of reporting barriers.

Results related to technology use indicated that teachers reported moderate to high levels of use overall, with the highest usage observed in communication, collaboration, productivity, and online safety. Differences in technology use were selective and context-specific, with Title I status, certification level, and gender influencing certain areas, while years of experience showed no significant differences.

Overall, the findings suggest that the digital divide in secondary education is multifaceted and influenced more by structural factors than individual characteristics. The study highlights the need for systemic solutions that address access, support, and instructional practices to promote equitable technology integration in schools.

Artificial Intelligence (AI) Use Disclosure Statement

In the preparation of this dissertation, no Artificial Intelligence (AI) tools were used.

Digital Accessibility Disclosure Statement

In the preparation of this dissertation, the following digital accessibility tools were used to ensure this document complies with federal requirements: the built-in Accessibility Checker in Microsoft Word, Adobe Acrobat Pro accessibility tools, and screen reader compatibility features such as those supported by JAWS. The author acknowledges full responsibility for the intellectual content of this work and has made a good faith effort to comply with digital accessibility requirements in publishing, wherein the nature of the content does not significantly change in order to do so. Furthermore, all content has been reviewed and revised to meet these requirements prior to final publication.

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Chapter 1

Introduction

In today's digital age, technology had become an essential tool for education, yet many students in Title I schools continued to face significant barriers in utilizing technology. This challenge was part of the broader digital divide, which referred to the inequality in access to digital technology among different groups of people. Factors such as income level, geographic location, and educational opportunities contributed to this gap, limiting students' ability to utilize technology for learning and academic success (van Dijk, 2020). Title I schools were institutions that received federal funding through a program designed to support schools with a high percentage of students from low-income families. This funding aimed to provide additional resources and support to help students meet academic standards and close educational gaps caused by economic disadvantages (U.S. Department of Education, 2023). Despite these efforts, students in Title I schools often faced ongoing challenges in accessing digital tools, further deepening the divide between them and their peers in non-Title I schools.

Teaching technology in Title I schools presented significant challenges, particularly in environments where resources were limited. Students living in poverty already face numerous hardships, and a lack of access to quality education should not have added to their burdens. According to Deklich (2021), poverty had profound effects on students' mental, social, and physical well-being. Without adequate educational support, these challenges could contribute to ongoing difficulties in their lives. Schools in economically disadvantaged areas, often characterized by lower property values, typically had fewer resources and less support compared to schools in more affluent communities. Deklich (2021) emphasized that even after accounting for student needs, school districts with high poverty levels in California received approximately

two percent less funding per student compared to wealthier districts. This funding gap limited the ability of these schools to offer a diverse curriculum and provide necessary resources, such as textbooks and computers, which were essential for student learning and academic success.

The problem was further complicated by funding models that often-disadvantaged Title I schools. Schools in wealthier areas benefited from higher property taxes, which funded better resources, whereas schools in lower-income areas struggled with declining enrollment and inadequate financial support. This lack of funding directly affected the quality of education, limiting not only technology access but also the variety of classes and extracurricular activities available to students (American University School of Education, 2020).

In today's technology-driven world, access to infrastructure, digital tools and resources are essential for quality education. However, Title 1 schools face significant barriers in providing access to their students. This digital divide, where certain schools have the technology and resources to foster a modern learning environment while others do not, creates a major educational gap. Schools in affluent areas are often equipped with the latest devices, fast internet connections, and a wide range of software and digital tools, allowing students to stay competitive in an increasingly digital society. On the other hand, schools in low-income and minority communities frequently lack the funding to provide necessities like computers, reliable internet, and up-to-date software and technology.

This divide has a profound impact on the educational outcomes of students in underfunded schools. Without access to essential technology, students struggle to keep up with their peers in wealthier areas, both academically and in developing critical digital skills. Teachers in these schools face additional challenges, as they are expected to teach technology-focused subjects like computer science and Science, Technology, Engineering, and Mathematics (STEM)

without the necessary tools. Many educators are left to seek their own funding or make do with outdated equipment, which only worsens the learning gap between students from different economic backgrounds.

Underfunded schools often struggle to provide the same curriculum options as their wealthier counterparts, lacking basic supplies such as books and computers. Affluent schools typically offer a variety of electives, including music, theater, STEM, and sports programs, which are frequently unavailable in schools with limited funding. To bridge this gap, it is essential for low-income schools to receive equitable, if not additional, funding to address their students' needs. Students in these schools often require increased academic and mental health support; however, the current education system falls short of delivering resources where they are most needed (Deklich, 2021).

Moreover, funding disparities between school districts intensify these challenges. Districts with higher concentrations of Black, Latino, or Native American students often receive significantly less funding per student than districts with fewer students of color. This inequity limits the ability of these schools to offer diverse curricula and necessary educational tools, further widening the educational gap (The Education Trust, 2018).

Disparities in public school funding have long contributed to unequal educational outcomes, particularly for students in low-income and minority communities. The American University School of Education (2020) further underscores how these financial disparities result in significant achievement gaps, with predominantly minority-serving districts receiving considerably less funding per student than wealthier, often smaller, predominantly white districts. Such inequities restrict access to essential resources like modern digital tools and qualified teachers, widening the opportunity gap. Both sources highlight the urgent need for systemic

funding reform and targeted investment to close the digital divide and ensure that all students have equal opportunities to thrive in a technology-driven society.

Students in low-income schools adapt to their environment, and as a result, their goals often differ from those of students in non-minority schools. Carroll et al. (2004) emphasized that students from economically disadvantaged backgrounds often lack the same educational opportunities as their more affluent peers. This disparity is primarily due to underfunded schools that fail to provide essential facilities and conditions necessary for quality education. Consequently, both educators and students in these settings face significant challenges in achieving educational excellence. Upon entering the classroom, educators often become highly aware of numerous limitations and restrictions that can create a sense of constraint. Despite these challenges, dedicated teachers remain steadfast in their commitment to support students in reaching their full potential and achieving their goals. This unwavering dedication is crucial, as teachers play a significant role in fostering student success. Research indicates that teachers matter more to student achievement than any other aspect of schooling (Opper, 2019).

Addressing the digital divide in education is crucial to ensure that all students, regardless of their socioeconomic status, have access to the tools they need for success. This research will analyze differences in technological access and integration, explore barriers hindering technology use, and investigate how often technology integration/practices occur.

Theoretical Framework

This study examines the disparities in technology access and educational resources between Title I and non-Title I secondary schools in South Alabama. To analyze these disparities, the research is grounded in one primary theoretical perspective: the Digital Divide Framework. This framework is essential for understanding how differences in socioeconomic status,

geographic location, and school funding contribute to unequal access to technology and digital learning resources.

Dijk (2004) emphasized that Digital Divide Framework focuses on the gap between individuals and communities that have access to modern information and communication technologies (ICT) and those that do not. It highlights how socioeconomic factors influence the availability, usage, and benefits of digital tools. The framework is commonly categorized into three levels:

1. First-Level Digital Divide – Differences in access to physical technology, such as computers, tablets, and internet connectivity.
2. Second-Level Digital Divide – Variations in how technology is used, including disparities in digital literacy, instructional integration, and teacher training.
3. Third-Level Digital Divide – The long-term consequences of unequal technology access, including impacts on student achievement, career readiness, and social mobility.

Title I schools, which serve a high percentage of low-income students, often face significant technological challenges compared to non-Title I schools. In this study, the Digital Divide Framework will be used to examine key factors contributing to technological disparities, including:

- Availability of Digital Devices – Investigating whether students and teachers in Title I schools have adequate access to computers, tablets, and other digital tools necessary for learning.
- Internet Connectivity – Assessing differences in broadband access both at school and at home, which can impact students' ability to complete assignments, engage in remote learning, and access online educational resources.

- Integration of Technology in Curriculum – Exploring how technology is incorporated into classroom instruction, the availability of teacher training on digital tools, and whether schools can effectively use technology to enhance student learning.

By integrating the Digital Divide Framework, this study aims to provide a comprehensive understanding of the complexities surrounding educational inequities in technology access. The framework offers insights into the practical implications of these disparities, particularly in how they affect learning outcomes and overall educational opportunities. Findings from this research will help identify specific areas where interventions are needed to bridge the digital gap. These may include:

- Expanding funding for technology in Title I schools
- Improving broadband infrastructure in underserved areas
- Enhancing teacher training programs on digital tools and instructional strategies
- Implementing policies that ensure equitable access to digital learning resources.

By addressing these disparities, this study seeks to inform educators, policymakers, and community leaders about strategies to promote equitable educational opportunities for all students. The goal is to ensure that technological access is not a barrier to learning but a tool for enhancing academic success, particularly in underprivileged school settings. (Organization for Economic Co-operation and Development, 2021)

Statement of the Problem

The problem this research addresses is the persistent digital divide in Title 1 vs. non-Title I schools where many students lack access to essential technology, such as computers, the internet, and digital learning tools and devices. This limited access puts these students at a disadvantage, affecting their academic performance and hindering their ability to keep up with

their peers in more affluent schools. Despite the growing importance of technology in education, disparities in access continue to widen, intensifying educational inequality. The research aims to examine the impact of limited technological access in Title I schools, and the educational impact of the digital divide.

Significance of Study

This study is significant because it addresses the growing concern of the digital divide in education, particularly how limited access to technology in Title 1 schools affects educational inequalities. Technology is an essential part of learning and future career opportunities, students who lack access to digital tools are at a disadvantage, which can hinder their academic performance, skill development, and future success.

By investigating the causes and effects of this divide, the study provides valuable insights into how unequal technology access negatively impacts students' learning experiences and overall academic performance. The research also highlights the urgent need for equitable funding and resource allocation to ensure that all students, regardless of socioeconomic status, have the tools necessary to compete in an increasingly digital world.

This study is important for educators, policymakers, and school administrators, as it can inform decisions about how to close the technology gap. By identifying potential solutions such as increased funding, targeted grants, and community partnerships the research aims to provide practical recommendations that can help bridge the divide. Ultimately, this study seeks to promote greater educational equity, ensuring that all students have an equal opportunity to succeed in a tech-driven society.

Research Purpose

This study aims to investigate the availability and use of digital devices and tools in secondary education classrooms across South Alabama. It will analyze whether significant differences exist in technological access and integration based on factors such as Title I status, school classification, and school ratings. The research will also explore the barriers, both extrinsic and intrinsic, that hinder technology. Moreover, this research will investigate how often technology integration/practices occurs.

Research Questions

Research Question 1: Are there significant differences that exist in technological access and integration based on demographic factors such as Title I status, school classification, and school rating.

Research Question 2: What barriers do teachers perceive as preventing access to technology in Title I and non-Title I schools?

Research Question 3: How often do teachers use technology to improve teaching and learning and is there a difference based on demographic factors, including Title I status, years of experience, gender, and level of certification?

Definition of Terms

1. Digital Devices - Physical technological tools used in education, such as laptops, desktops, tablets, interactive whiteboards, and handheld devices, which enable teaching and learning activities (Great Schools Partnership, n.d.).
2. Title 1 - Schools that receive federal funding to support students from low-income families to ensure they meet educational standards (U.S. Department of Education, 2020).

3. Digital Divide – The gap between individuals or communities who have access to modern information and communication technologies, such as computers and the internet, and those who do not (Van Dijk, 2020).
4. City/County - Geographic classification of schools based on their location within a city or county jurisdiction (U.S. Census Bureau, 2021).
5. School Rating - Performance evaluation metrics assigned to schools, often based on standardized test scores, graduation rates, or other benchmarks (U.S. Department of Education, 2019).
6. Digital Tools - Software and online platforms used to enhance learning experiences, including educational apps, content management systems (e.g., Google Classroom), video conferencing tools, and simulation tools (Great Schools Partnership, n.d.).
7. Integration - The regular, structured use of digital tools in teaching and learning processes, measured by frequency (daily, weekly) or extent (number of subjects/tools used) (Great Schools Partnership, n.d.).
8. Teacher Certification Level - Formal qualification levels of teachers, including bachelor's degrees, master's degree, doctoral degrees, or professional certifications relevant to teaching (National Board for Professional Teaching Standards, 2020).
9. Perceived Barriers - Factors identified by educators as hindering access to technology, such as lack of funding, insufficient devices, inadequate training, or poor internet infrastructure (Great Schools Partnership, n.d.).

10. Access to Technology -The ability of students and teachers to use digital devices and tools for educational purposes, whether in or out of the classroom (Great Schools Partnership, n.d.).
11. Academic Performance - Outcomes related to student learning, including grades, performance on standardized tests, progress in subjects, or teacher-assessed learning goals (Great Schools Partnership, n.d.).
12. Middle School vs. High School - Categorization of schools based on the grade levels they offer (e.g., middle schools: grades 6-8; high schools: grades 9-12) (National Center for Education Statistics, 2022).
13. Strategies - Planned actions or policies implemented to increase access to technology, such as technology grant applications, partnerships with tech companies, implementing Bring Your Own Device (BYOD) policies, or training programs for teachers (Great Schools Partnership, n.d.).
14. Effectiveness - The degree to which strategies achieve their intended outcomes, measured by teacher and student satisfaction, reduced digital divide indicators, increased engagement, or improved academic results (Great Schools Partnership, n.d.).

Limitations

This study is subject to several limitations that may affect the conclusions and their impact on other subjects. First, geographic focus is restricted to secondary education classrooms in South Alabama school systems, which may limit the generalizability of the findings to other regions or educational settings. Additionally, the study relies on survey responses from teachers, and the conclusions are dependent on the number of respondents. A smaller or unrepresentative

sample size may not fully capture the broader perspectives of educators. Furthermore, the use of a self-reported survey instrument introduces the potential for response bias, as participants' answers are based on their personal perceptions rather than objective data. The cross-sectional design of the study also presents a limitation, as data collection occurred at a single point in time, preventing an analysis of trends or changes over time. The scope of the study is further constrained by its focus on specific demographic and school-related factors, excluding other influential variables such as funding disparities, parental involvement, or community support. Finally, the rapidly evolving nature of technology presents a challenge, as the findings may not fully reflect future advancements or changes in educational technology. These limitations should be carefully considered when interpreting the results and applying them to other situations.

Delimitation

Delimitations are the boundaries established by the researcher to define the scope of the study. This research is specifically focused on secondary education classrooms in South Alabama school systems and includes only teachers instructing grades 6-12. It concentrates on understanding teachers' perceptions, strategies, and experiences related to technology access and integration, excluding other perspectives such as those of students, parents, or administrators. The study is further limited to certain variables, such as Title I status, school classification, and teacher certification levels, leaving out other factors like community resources or statewide policies. These boundaries were intentionally set to create a focused framework for addressing the research questions effectively.

Summary

Chapter one focuses on the digital divide in education, especially in Title I schools where many students from low-income families lack access to essential technology. These schools often

face funding challenges that limit resources, teacher support, and student opportunities. In contrast, schools in wealthier areas have more funding, better technology, and a wider range of learning programs.

The study uses the Digital Divide Framework to explore three main issues: access to technology, how it's used in classrooms, and the long-term impact of unequal access. It aims to understand how these issues affect students and teachers in secondary schools across South Alabama. The research highlights the importance of fair funding, better teacher training, and improved access to digital tools to help close the gap and create equal opportunities for all students.

Chapter 2

Literature Review

Introduction

The purpose of this study is to examine the availability and use of digital devices and tools in secondary education classrooms across South Alabama. It will analyze whether significant differences exist in technological access and integration based on factors such as Title I status, school classification, and school ratings. The research will also explore the barriers, both extrinsic and intrinsic, that hinder technology. Moreover, this research will investigate how often technology integration/practices occurs.

This chapter reviews existing research on technology access and integration in schools. It focuses on how these issues vary by Title I status, school classification, school performance rating, teacher certification level, and years of experience, reflecting the demographic factors included in the survey. Together, this framework provides a foundation for understanding the digital divide in South Alabama secondary schools and sets the stage for the analysis presented in later chapters.

The Digital Divide in Education

The digital divide refers to the gap between those who have access to technology and the internet and those who do not. It encompasses disparities in broadband access, device availability, and digital literacy skills (Afzal et al., 2023). Research indicated that the digital divide is more than just an issue of access; it also includes the ability to effectively use technology for educational purposes (Miah, 2024). The persistence of this divide has led to growing concerns about its long-term impact on students' ability to succeed academically and professionally (Pierce & Cleary, 2024). Early definitions of the digital divide focused on physical

access to computers and internet connectivity, but recent frameworks emphasize multiple levels of inequality, including access, skills, and meaningful usage of technology. In other words, beyond simply having devices or internet, differences emerge in how effectively students and teachers can integrate technology into learning. Marginalized communities including low-income households and students of color consistently report lower rates of high-speed internet access and device availability at home. These pre-existing inequities have been intensified by the increasing reliance on online resources in education, especially during the COVID-19 pandemic. Recent studies, including *The Persistent Educational Digital Divide and Its Impact on Societal Inequality*, confirm that unequal access to technology (e.g., lacking a computer or broadband at home) has become a critical barrier to educational opportunity, contributing to wider achievement gaps between advantaged and disadvantaged student groups (Pierce & Clearly, 2024). Overall, the literature indicates that the digital divide in education is a multi-faceted issue rooted in socioeconomic and racial inequities, requiring careful analysis of who can connect with what resources, and to what educational effect.

Theoretical models such as Jan van Dijk's digital divide framework and the U.S. Department of Education's digital access framework provide insight into these disparities. Van Dijk (2004) and others argued that digital inequality reinforces existing social inequality, as those with limited access also tend to have fewer digital skills and opportunities to benefit from technology. The Department of Education (2020) further distinguished between digital access, digital design, and digital use divides: the first is inequitable access to connectivity and devices, the second is unequal support for educators to design tech-enabled learning, and the third is unequal implementation of technology in pedagogically meaningful ways. Applying these frameworks in education reveals that students in well-resourced schools not only have more

devices and broadband access but also benefit from curricula and instruction that integrate technology into learning. In contrast, students in under-resourced, high-poverty schools often experience a compounded divide lacking the tools, the trained support, and the enriched learning activities that technology can afford (DeMio, 2024). This literature base stresses that the digital divide in education is not a singular gap but a layered inequality affecting access, pedagogy, and student outcomes.

Title I schools Vs. non-Title I schools

Title I schools are public schools that receive federal funding to support students from low-income backgrounds. These schools often serve a high percentage of minority students and face systemic resource shortages compared to non-Title I schools (Mohamed, 2022; Domanico, 2024). Research highlights stark differences in technology access and usage between Title I and non-Title I schools, with students in high-poverty schools often having fewer digital tools and less reliable internet connectivity (Pierce & Cleary, 2024).

Educators in Title I schools report that many students lack home internet access, making it difficult to complete online assignments or participate in remote learning (UCLA Center for Neighborhood Knowledge, 2020). One study found that teachers in high-poverty schools estimated that only 30% of their students had consistent access to high-speed internet at home, compared to 83% in low-poverty schools (Afzal et al., 2023). This digital divide means that students in Title I schools are more likely to fall behind in digital literacy and academic achievement due to inadequate access to technology-based learning resources (Smith, 2023).

Beyond home access, disparities also exist in how technology is used in classrooms. While non-Title I schools often integrate technology into interactive and student-centered learning, Title I schools may use technology more passively, such as for standardized test

preparation rather than creative digital engagement (Miah, 2024). These differences result from lower funding allocations for teacher training, technology infrastructure, and curriculum development in under-resourced schools (American Progress, 2024).

During the COVID-19 pandemic, many non-Title I schools quickly transitioned to online learning by distributing laptops and Wi-Fi hotspots, while Title I schools struggled to provide students with the necessary resources (Pierce & Cleary, 2024). As a result, learning gaps widened, disproportionately impacting minority and low-income students. Research suggests that unless systemic interventions are implemented such as increased federal funding, broadband expansion, and educator training Title I students will continue to experience educational disadvantages in the digital age (Mohamed, 2022).

Infrastructure and Staff Support

One of the most critical factors shaping the integration of technology in schools is the availability of infrastructure and staff support. Research consistently demonstrates that access to digital devices, reliable internet connectivity, productivity software, and adequate technical assistance directly influence teachers' ability to incorporate technology into instruction (Afzal et al., 2023; Smith, 2023). Schools with stronger technology infrastructure not only provide students with greater opportunities for digital learning but also foster environments where teachers feel more confident experimenting with new tools and strategies. Conversely, when infrastructure is inadequate, teachers often struggle to sustain meaningful technological use, regardless of their willingness or skill level.

Device and hardware access remains a central concern in schools serving low-income students. One-to-one programs, mobile laptop carts, and computer labs are more common in well-funded schools, while Title I schools frequently report shortages of available devices,

forcing students to share computers or rely on outdated models (Pierce & Cleary, 2024). Limited access to hardware such as projectors, printers, and interactive whiteboards can also constrain classroom instruction, preventing teachers from offering the same range of activities as their peers in non-Title I schools (Miah, 2024).

Internet reliability and speed play an equally significant role in classroom practice. Teachers report that unstable or slow connections disrupt instructional flow and discourage consistent use of online tools. In some rural and urban Title I schools, bandwidth remains insufficient to support multiple devices operating simultaneously, making it difficult to conduct technology-enhanced lessons (UCLA, 2020). In contrast, schools with robust broadband infrastructure allow teachers to integrate multimedia resources, digital collaboration platforms, and research-based online content more seamlessly.

Access to productivity software and digital resources also shapes instructional opportunities. Applications such as word processors, slide presentation tools, and graphic organizers are often taken for granted in wealthier districts, but underfunded schools may lack licenses for up-to-date software or subscriptions to educational platforms (American Progress, 2024). These disparities limit students' exposure to the same digital learning environments that are considered standard in more affluent contexts.

Another crucial element of infrastructure is the availability of technical support and staffing. Teachers working in well-resourced districts are more likely to have on-site media specialists and IT staff who can troubleshoot issues, provide maintenance, and guide instructional design (Domanico, 2024). In many Title I schools, however, technical staff positions are either understaffed or nonexistent, forcing teachers to resolve issues independently,

often during class time. This lack of support not only reduces instructional time but also discourages teachers from experimenting with more advanced technology tools.

Finally, professional development opportunities are an essential component of staff support. Teachers who receive consistent training on integrating digital tools are more likely to incorporate technology into lesson design, assessment, and classroom management (Mohamed, 2022). However, educators in underfunded schools often report limited or inconsistent professional development, leaving them underprepared to take advantage of available technology (Pierce & Cleary, 2024). Ongoing, job-embedded training has been shown to build teacher confidence and increase the instructional value of digital resources.

Taken together, these components devices, internet connectivity, software access, staffing, and professional development represent the infrastructure and staff support conditions measured in Section 1 of the teacher survey. The literature suggests that disparities in these areas are strongly associated with school characteristics such as Title I status, school classification, and school performance rating. Understanding how these factors shape teachers' access to technology provides an essential foundation for examining broader patterns of digital equity across South Alabama secondary schools.

Teacher-Perceived Barriers to Technology Integration

While infrastructure establishes the foundation for technology use, teachers' perceptions of barriers often determine the extent to which digital tools are integrated into instruction. Even when devices and connectivity are available, both external and internal challenges may restrict effective use. The literature identifies a range of obstacles, many of which are captured in Section two of the teacher survey and align with the second research question on teacher-perceived barriers.

External barriers are among the most frequently reported challenges, particularly in schools serving low-income students. Funding limitations often prevent districts from purchasing up-to-date devices or renewing software licenses, leaving teachers with outdated tools that cannot support current applications (Afzal et al., 2023). Insufficient internet connectivity and limited bandwidth further complicate classroom use, especially in rural and urban Title I schools where infrastructure investments lag behind wealthier districts (Smith, 2023). Restrictive school policies, such as excessive content filtering or limited permissions for students, can also hinder teachers' ability to integrate online resources into lessons (Pierce & Cleary, 2024).

Internal barriers reflect the skills, attitudes, and confidence of teachers themselves. A lack of digital literacy training contributes to low levels of self-efficacy, leaving educators unsure of how to effectively incorporate new technologies (Miah, 2024). Time constraints are another commonly cited issue; teachers already face heavy workloads, and finding the additional time needed to learn and adapt digital tools can feel overwhelming (Mohamed, 2022). Resistance to change, fear of losing classroom control, and negative past experiences with technology further reduce willingness to experiment with new resources (Domanico, 2024).

Student-related barriers also emerge in literature. Teachers in high-poverty schools report that students often have limited digital literacy skills, which makes classroom integration more difficult (UCLA, 2020). Some educators describe student disengagement, lack of motivation, or inconsistent access to devices at home as obstacles to building continuity between school-based and home-based learning (Smith, 2023).

These barriers are not distributed equally across all school settings. Teachers in Title I schools report higher levels of extrinsic barriers, particularly related to funding, outdated devices, and inadequate technical support (Afzal et al., 2023). By contrast, teachers in non-Title I

schools are more likely to emphasize time constraints or pedagogical concerns rather than basic access challenges (Pierce & Cleary, 2024). Teacher demographics also influence perceptions: educators with fewer years of experience or lower levels of certification often report lower confidence and greater difficulty integrating technology compared to more experienced or highly certified peers (Ertmer & Ottenbreit-Leftwich, 2010).

The cumulative effects of these barriers are significant. Even when technology is technically available, perceived obstacles can discourage teachers from integrating digital tools meaningfully, leading to uneven adoption across schools and classrooms. Identifying and addressing these barriers is therefore critical for promoting equitable technology use in South Alabama secondary schools.

Frequency of Technology Use in Teaching and Learning

Beyond access and barriers, the frequency with which teachers use technology provides an important measure of integration. Frequency reflects not only the availability of infrastructure but also teachers' confidence, instructional practices, and perceptions of technology's value. Section three of the teacher survey specifically examines how often teachers report using technology for lesson planning, assessment, communication, professional productivity, and professional development. These practices align with the third research question, which explores differences in technology use across demographic factors such as Title I status, years of teaching experience, certification level, and gender.

Instructional practices represent one of the most common areas of technology use. Teachers integrate digital tools to design learner-centered lessons, locate and evaluate resources, and incorporate project-based activities. Studies show that teachers in schools with stronger infrastructure report daily or weekly use of digital resources to enhance student engagement,

while those in underfunded schools often rely on technology less frequently or in more limited ways (Afzal et al., 2023). In some Title I schools, teachers may use technology primarily for drill-based activities or standardized test preparation, while in non-Title I schools, teachers are more likely to apply technology for collaborative and creative learning experiences (Miah, 2024).

Assessment practices also reflect varying levels of frequency. Many teachers use technology to design performance-based assessments such as portfolios, multimedia presentations, and online quizzes. Others employ digital platforms to collect and analyze student performance data, enabling more data-driven instruction. However, in settings where access is limited or bandwidth is unreliable, teachers report infrequent use of these tools, instead relying on traditional paper-based assessments (Smith, 2023).

Differentiation and inclusion are another area where technology plays a key role. Teachers frequently report using digital tools to adapt lessons for students with special learning needs, language barriers, or individualized education plans. The frequency of such practices is often tied to teacher experience and training; more confident educators integrate differentiation strategies more consistently, while less experienced teachers may use them sporadically (Pierce & Cleary, 2024).

Communication and collaboration with families and colleagues is an area of growing importance. Teachers use technology to share grades, assignments, and announcements with families, as well as to collaborate with peers on lesson planning and resource sharing. While some educators report daily use of digital communication systems, others particularly in schools with outdated or inconsistent platforms rely on them less frequently, limiting opportunities for connection (Mohamed, 2022).

Professional productivity and development also vary in frequency across schools and teachers. Educators in well-resourced schools often report using digital tools daily for grading, planning, and classroom management, while those in underfunded contexts may have fewer opportunities due to limited access or lack of training. Similarly, professional development delivered through online platforms is widely available, but teachers in low-resource schools may participate less frequently if training is not prioritized or supported by leadership (Domanico, 2024).

Overall, the literature indicates that frequency of technology use is shaped by both external conditions and individual teacher factors. Teachers in non-Title I schools, those with advanced certifications, and those with more years of experience often report higher levels of integration (Afzal et al., 2023). By contrast, teachers in Title I schools or with less professional support may use technology less frequently or in more limited ways. Understanding these differences is critical for evaluating the depth of technology integration and identifying strategies to ensure that all students benefit from meaningful digital learning opportunities in South Alabama secondary schools.

Addressing Technology Inequities

Although infrastructure, barriers, and frequency of use remain the primary domains of this study, it is important to briefly review strategies that schools and policymakers have implemented to address inequities in educational technology. These strategies provide useful context for understanding how educators and districts attempt to mitigate the challenges identified in the previous sections.

One common approach has been the implementation of one-to-one device initiatives and expanded access programs. Many districts, particularly in response to the COVID-19 pandemic,

distributed laptops, tablets, or Wi-Fi hotspots to ensure that students had the minimum tools needed for digital participation (Afzal et al., 2023). While these programs increased baseline access, research shows that devices alone are insufficient without consistent internet connectivity, technical support, and teacher training (UCLA, 2020; Pierce & Cleary, 2024).

Another strategy involves broadband expansion and public-private partnerships designed to provide affordable or subsidized internet access for low-income households. Federal and state initiatives, combined with local partnerships, have attempted to reduce gaps in home connectivity; however, progress remains uneven, especially in rural and high-poverty areas (American Progress, 2024).

Schools have also invested in professional development and digital literacy training for educators. Ongoing, job-embedded training has been shown to improve teacher confidence, support integration of new tools, and increase student engagement (Mohamed, 2022). Yet, underfunded schools often report limited opportunities for sustained professional learning, which reduces the long-term impact of these initiatives (Domanico, 2024).

Finally, community engagement and partnerships play a role in expanding equity. Collaborations with nonprofit organizations, businesses, and local governments have supported device lending programs, after-school technology access, and digital equity grants. These partnerships, while beneficial, are often dependent on temporary funding and therefore vary widely in sustainability (Smith, 2023).

Overall, the literature suggested that while multiple strategies have been deployed to narrow the digital divide, significant inequities persist. Efforts to improve infrastructure, reduce barriers, and promote frequent, meaningful technology use remain inconsistent, particularly in Title I schools. This underscores the importance of studies such as the present one, which

investigate how teachers experience these inequities in their daily practice and highlight areas where additional support is most needed.

Summary and Research Implications

The literature reviewed in this chapter highlights the persistence of the digital divide in education and its implications for teachers and students, particularly in Title I schools (van Dijk, 2020). Prior studies confirm that inequities extend beyond basic access to technology and encompass issues of infrastructure and staff support, barriers to effective integration, and the frequency with which teachers use technology in their instructional practice. These themes correspond directly to the three domains explored in this study.

First, research demonstrated that infrastructure and staff support including access to devices, reliable internet, productivity software, technical support staff, and professional development play a crucial role in shaping teachers' ability to integrate technology meaningfully. Title I schools are more likely to report shortages of devices, inconsistent internet connectivity, and limited support staff, leaving teachers without the tools or assistance needed to fully leverage digital learning resources.

Second, the literature identifies a wide range of teacher-perceived barriers to technology use. These include external obstacles such as limited funding, outdated devices, inadequate bandwidth, and restrictive school policies, as well as internal factors such as lack of training, low confidence, resistance to change, and time constraints. Studies consistently show that teachers in Title I schools face more acute external barriers, while differences in certification, years of experience, and gender also influence teachers' perceptions of challenges.

Third, existing research highlights important differences in the frequency of technology use across schools and teaching demographics. While some educators use technology daily to

support instruction, assessment, communication, and professional productivity, others report much less frequent use, often due to limited access or lack of support. Title I status, certification level, and years of experience emerge as significant predictors of how often teachers report integrating technology into their practice.

Finally, the literature points to ongoing efforts to address technology inequities through device distribution, broadband expansion, professional development, and community partnerships. While these strategies have produced progress in some contexts, they remain unevenly implemented and often fail to fully close digital gaps in high-poverty schools.

Taken together, this review demonstrates that technology access and integration are shaped by a combination of infrastructure conditions, perceived barriers, and frequency of use, all of which intersect with demographic factors. These findings underscore the need for localized studies that capture teachers' perspectives within specific contexts, such as South Alabama secondary schools. By situating this study within the existing research, Chapter 2 establishes a clear foundation for the methodology described in Chapter 3, where the survey instrument and analytical approach are introduced to investigate these issues in detail.

Chapter 3

Research Methodology

Introduction

The purpose of this study was to examine the availability and use of digital devices and tools in secondary education classrooms across South Alabama. The present study explored whether significant differences in technology integration and availability existed based on factors such as a school's Title I status, school classification, and school rating. In addition, the study identified the main barriers educators faced when implementing technology in the classroom. Furthermore, the research investigated the frequency of technology integration practices.

To gather data for this study, a structured survey was developed. The survey titled Infrastructure, Support, Barriers, and Technology (ISBT) Survey (see Appendix A) was designed for secondary school teachers and was used to collect quantitative data. The ISBT survey contained four main sections, each aligned with the research goals and carefully crafted to provide insight into different dimensions of technology access and integration, including technology access, barriers, technology integration practices, and demographic information. Once distributed and completed, the survey provided a clearer understanding of how digital inequities affected South Alabama secondary schools. The data collected were analyzed to identify trends, challenges, and effective strategies to inform future policy decisions aimed at addressing digital inequities in education.

Before any data were collected, approval was secured from the appropriate Institutional Review Board (IRB) (see Appendix G) to ensure that the study met all ethical requirements for research involving human participants. Participation was voluntary, and teachers were required to review an informed consent statement (see Appendix I) before accessing the survey. The

consent form explained the purpose of the study, the procedures involved, potential risks and benefits, and participants' right to withdraw at any time without consequence. No identifying information was collected, and all responses were kept confidential. Data were stored securely and reported only in aggregate form to further protect participant privacy. District approval (see Appendix J) was also obtained prior to distributing the survey to schools.

Target Population and Sample

The target population for this study consisted of secondary school teachers (grades 6–12) within the Mobile County Public School System and Accel Academy Charter Career Tech Center. These schools represented a diverse sample of educational settings across South Alabama, including both Title I and non–Title I schools. The study included twelve schools consisting of six middle schools, five high schools, and one charter school. Among these, eight schools were classified as Title I and four were classified as non–Title I.

An email was sent to the principal of each participating school requesting approval for teacher participation (see Appendix B). To maintain privacy and confidentiality, teacher email addresses were not obtained directly by the researcher. Instead, principals forwarded the recruitment email, information letter, and survey link to teachers within their schools. This procedure ensured compliance with district guidelines while protecting participant confidentiality (See Appendix C).

Recruitment emails were sent to 407 teacher emails. A total of 119 survey responses were received; however, only 101 were fully completed and included in the final analysis, resulting in a 24.8% response rate. The participating schools included middle schools, high schools, and one charter school. The schools included in the sample are presented in Tables 1–3.

Table 1*Middle Schools in the Sample*

School Name	Number of Teachers	Title I Status
Clark Shaw Magnet School	30	Yes
Grand Bay Middle	78	Yes
Mobile County Training	15	Yes
Causey Middle School	75	No
Booker T. Washington	18	Yes
Burns Middle	41	Yes

Note. Data represents middle schools in the Mobile County Public School System that participated in this study.

Table 2*High Schools in the Sample*

School Name	Number of Teachers	Title I Status
Murphy High School	54	Yes
Citronelle High School	43	Yes
Vigor High School	31	Yes
Faulkner State Career Tech Center	14	No

Note. Data represents high schools in the Mobile County Public School System that participated in this study.

Table 3

Charter School in the Sample

School Name	Number of Teachers	Title I Status
Accel Academy Charter Career Tech Center	8	No

Note. Accel Academy Charter Career Tech Center is included as the charter school in the study sample.

Data Collection Procedure

The survey (Appendix A) for this study was distributed electronically using Qualtrics, a secure online survey platform. Qualtrics was selected for its accessibility, reliability, and ability to ensure confidentiality in data collection. The platform also allowed the researcher to organize and export responses efficiently once the data collection period closed.

To ensure proper protocol, the researcher first emailed the principals of all participating schools to request approval to distribute the survey (see Appendix B). After approval was obtained (see Appendix C), the survey link and informational letter were sent through official district communication channels. The informational letter explained the purpose of the study, estimated completion time, voluntary nature of participation, and confidentiality measures (see Appendix D).

To increase response rates, a follow-up reminder was sent approximately two weeks after the initial distribution using the same communication channels. After the survey closed, the researcher downloaded all responses directly from Qualtrics for analysis.

Research Design

This study used a nonexperimental, quantitative survey research design to explore teachers' perceptions of technology access and use in secondary schools across South Alabama. A survey method was selected because it allowed for the efficient collection of data from a large number of teachers regarding their experiences with technology infrastructure, staff support, perceived barriers, and frequency of technology use.

The study included both descriptive and inferential statistical analyses. Descriptive statistics, including means, frequencies, and percentages, were used to summarize teachers' responses across all survey items and to provide an overview of general trends. Inferential statistics were used to examine whether significant differences existed between groups of teachers and schools. Specifically, chi-square tests were conducted to compare categorical responses across variables such as Title I status, school classification, and school rating. One-way analyses of variance (ANOVA) were conducted to test differences in average responses based on teacher characteristics, including years of experience, certification level, and gender.

This research design was appropriate because it did not involve the manipulation of variables but instead focused on capturing teachers' real-world perceptions of technology access and integration within their schools. Although this approach did not allow for the determination of cause-and-effect relationships, it provided meaningful insights into existing patterns of equity and inequity in technology use. The findings were intended to assist administrators, policymakers, and educators in identifying needs, improving infrastructure, addressing barriers, and promoting equitable access to technology across secondary schools.

Instrumentation

The instrument used in this study was adapted from the School Technology Needs Assessment (STNA) (Appendix E), developed by the SERVE Center at the University of North Carolina at Greensboro and distributed by the Friday Institute for Educational Innovation at North Carolina State University (Appendix F). Permission to use and adapt the instrument for educational, non-commercial purposes was granted by the Friday Institute (Appendix A). Per the consent agreement, the researcher was required to credit the original source, maintain the confidentiality of all data, and provide the Friday Institute with access to any resulting publications, presentations, or evaluation reports for potential use in future validity and reliability analyses.

The original STNA instrument utilized a five-point Likert-type scale for perception-based items (e.g., Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree), along with an additional “Don’t Know” response option to account for participants who may not have had sufficient knowledge or experience to respond to a given item. This five-point plus “Don’t Know” format allowed respondents flexibility but also introduced a midpoint (Neutral) and a non-substantive response category that could limit the interpretability of results.

For the purposes of this study, the Likert-type scale for the Infrastructure and Staff Support section was modified from a five-point scale to a four-point scale (Strongly Disagree, Disagree, Agree, Strongly Agree), and the “Neutral” and “Don’t Know” response options were removed. This modification was made to encourage more definitive responses and reduce central tendency bias, where participants may otherwise select a neutral midpoint rather than express a clear perception. The forced-choice format required respondents to indicate either agreement or disagreement, thereby improving the clarity and interpretability of the data. This approach is

supported in survey research as a method to enhance response discrimination and produce more meaningful comparisons across groups. All adaptations were made while preserving the original intent and structure of the STNA instrument, and full credit to the original developers (SERVE Center and Friday Institute for Educational Innovation) is maintained.

The survey was modified to align with the purpose of the study and the research questions. The adapted instrument measured teacher perceptions in three domains: infrastructure and staff support, teacher-perceived barriers, and frequency of technology use, and it also collected demographic information for group comparisons.

The final survey consisted of four sections:

1. **Infrastructure and Staff Support** – Thirteen items measured teacher perceptions of access to devices, internet connectivity, productivity software, staffing, professional development, and school communication systems. Items were rated on a four-point Likert type scale ranging from Strongly Disagree to Strongly Agree.
2. **Teacher-Perceived Barriers** – Sixteen items captured barriers that might have prevented technology use, such as limited funding, outdated equipment, inadequate training, restrictive policies, lack of confidence, and time constraints. Teachers selected all barriers that applied to their experiences.
3. **Frequency of Technology Use** – Fifteen items measured how often teachers used technology in instructional practice. Areas included lesson planning, assessment, differentiation, communication, professional productivity, and professional development. Responses were rated on a five-point scale: Daily, Weekly, Monthly, Once per Semester, or Never.

4. **Demographics** – Background information was collected, including gender, age, ethnicity, years of experience, certification level, grade level taught, and school characteristics (Title I status and performance rating). These data provided variables for comparative analysis.

The survey was administered electronically using Qualtrics, a secure online platform, which allowed participants to complete the instrument conveniently and confidentially. The estimated completion time was 10–15 minutes.

The survey (see Appendix A) was designed to collect a wide range of data in a consistent, structured manner that supported the research questions and allowed for comparison across groups. The survey link was shared with teachers via email, along with an informational letter (see Appendix D) explaining the purpose of the study, how responses would be used, and the steps taken to ensure confidentiality. Participation in the survey was voluntary, and no personally identifying information was collected. Prior to data collection, the study received approval from the appropriate Institutional Review Board (IRB) (see Appendix G) to ensure it met ethical standards for research involving human subjects.

Validity and Reliability

The School Technology Needs Assessment (STNA), developed by SEIR*TEC at the SERVE Center at the University of North Carolina at Greensboro in collaboration with the North Carolina Department of Public Instruction and distributed by the Friday Institute for Educational Innovation at North Carolina State University, has been widely used to evaluate technology access, barriers, and integration in educational settings. The instrument was developed as part of the LANCET project and is designed to assess teacher and student perceptions across multiple domains of technology integration.

Evidence of validity for the STNA is supported through its structured design and alignment with clearly defined constructs. The instrument measures four major constructs—supportive environment for technology use, professional development, teaching and learning, and impact of technology—each consisting of multiple subconstructs that reflect key components of technology integration in schools. The STNA was developed using systematic survey design procedures and has been used to inform school-level and district-level decision-making related to technology planning, resource allocation, and instructional improvement. These characteristics provide strong evidence of content and construct validity (see Appendix E)

For the purposes of this study, the instrument was adapted to align with the specific research questions and the context of South Alabama secondary schools. To further strengthen content validity, the adapted survey was reviewed by content experts in educational technology and survey design to ensure that all items remained aligned with the study's domains: infrastructure and staff support, teacher-perceived barriers, and frequency of technology use.

Reliability was assessed by calculating Cronbach's alpha coefficients for the Likert-type sections of the survey. The Infrastructure and Staff Support scale (13 items) demonstrated excellent internal consistency ($\alpha = .963$). The Frequency of Technology Use scale (15 items) also demonstrated excellent reliability ($\alpha = .908$). Both coefficients exceeded the minimum acceptable threshold of $\alpha \geq .70$, indicating strong internal consistency among the items within each construct. These findings are consistent with the structured design and prior applications of the STNA and support the use of composite variables for subsequent statistical analyses (see Table 4).

Table 4*Reliability of Scales*

Scale	N (Items)	Cronbach's Alpha
Infrastructure and Staff Support	13	.963
Frequency of Technology Use	15	.908

Checklist-style items related to teacher-perceived barriers were analyzed using frequency distributions, chi-square tests, and logistic regression analyses because they represented categorical data and were not appropriate for internal consistency reliability coefficients. Additionally, as a condition of the consent agreement with the Friday Institute, de-identified data collected using the instrument may have been shared for further psychometric testing to support ongoing validity and reliability research. All teacher responses remained confidential, and only aggregated, de-identified data were used for such purposes.

Data Analysis

To address the study's research questions, both descriptive and inferential statistical methods were used. These analyses examined how teachers' access to and use of technology differed based on key demographic characteristics. Independent variables included school-level factors such as Title I status, school classification, and school performance rating, as well as teacher-level factors including certification level, years of experience, and gender. The dependent variables were organized into three domains: (a) infrastructure and staff support, (b) teacher-perceived barriers, and (c) frequency of technology use.

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including means, frequencies, and standard deviations,

were used to summarize the data and provide an overview of trends across all survey items. Inferential tests, specifically chi-square analyses and one-way analyses of variance (ANOVA), were conducted to determine whether statistically significant differences existed among the groups.

Research Question 1: Are there significant differences in technological access and integration based on demographic factors such as Title I status, school classification, and school rating?

To answer this question, teachers' responses related to infrastructure and staff support were first examined using descriptive statistics to identify general patterns and trends across schools. To test differences between groups, chi-square analyses were conducted to compare responses by Title I status, school classification, and school rating.

Research Question 2: What barriers did teachers perceive as preventing access to technology in Title I and non-Title I schools?

To examine this research question, descriptive statistics were first used to identify the barriers teachers reported when attempting to access or integrate technology in their classrooms. Frequencies and percentages were calculated to summarize the most commonly reported challenges and to provide an overall understanding of the obstacle's teachers experienced.

To determine whether these perceived barriers differed between teachers working in Title I schools and those in non-Title I schools, chi-square analyses were conducted to compare the distribution of responses between the two groups. In addition, logistic regression analyses were performed to examine whether teacher demographic characteristics such as years of experience, certification level, and gender predicted the likelihood of reporting specific technology-related barriers.

Research Question 3: How often did teachers use technology to improve teaching and learning, and were there differences based on demographic factors such as Title I status, years of experience, gender, and level of certification?

To explore this question, descriptive statistics summarized how frequently teachers reported using technology in their classrooms. These results provided insight into patterns of technology use across schools.

Each of these analyses provided insight into whether specific school and teacher characteristics were associated with differences in infrastructure, barriers, and frequency of technology use. These findings highlighted gaps in digital equity and informed decisions regarding how schools and districts could better support teachers in integrating technology effectively.

Research Question Matrix

Table 5

Research Question Matrix with Survey Questions and Statistical Analysis

Research Question	Aligned Survey Sections/Items	Statistical Analysis	Aligned Demographic
1. Are there significant differences that exist in technological access and integration based on demographic factors such as Title I status, school classification, and school rating.	<p>“In my school...” (Strongly agree, agree, disagree, strongly disagree)</p> <ol style="list-style-type: none"> 1. I have access to enough computers (in the classroom, lab, or mobile cart) for at least one device per student. 2. I have sufficient access to hardware (e.g., projectors, printers, digital cameras). 3. I have reliable Internet access. 4. I have fast Internet access. 5. I have students who can access appropriate web resources without being blocked by unnecessary filters. 6. I have easy access to technical support (troubleshooting, maintenance). 7. I have a library media coordinator who is adequately staffed. 8. I have a technology director and/or technology assistant who is adequately staffed. 	<ul style="list-style-type: none"> - Descriptive statistics (means, frequencies) to summarize perceptions of infrastructure/staff support. - Chi-square tests to examine differences in categorical responses across Title I status, school classification, 	Title I status, School classification, School rating

	<p>9. I have access to productivity software (e.g., word processing, slide presentations, graphic organizers).</p> <p>10. I have access to ongoing technology-related professional development.</p> <p>11. I have access to ongoing technology-related support.</p> <p>12. I have adequate electronic systems for communicating with families (e.g., email, school web pages).</p> <p>13. I have adequate electronic systems for communicating within the school (e.g., email among teachers and staff, network drives, lesson and grade submissions).</p>	and school rating.	
2. What barriers do teachers perceive as preventing access to technology in Title I and non-Title I schools?	<p>Which of the following do you consider barriers to effective technology use in your classroom? (Select all that apply)</p> <ul style="list-style-type: none"> - Limited funding - Lack of available devices (e.g., laptops, tablets) - Insufficient internet connectivity/bandwidth - Inadequate technical support or maintenance - Outdated or incompatible technology - Restricted access due to school policies - Limited digital literacy training for teachers - Limited digital literacy training for students - Lack of confidence/self-efficacy - Limited belief in technology's educational value - Resistance to change - Lack of motivation/interest - Time constraints - Fear of losing control - Negative past experiences - Other (please specify): _____ 	<ul style="list-style-type: none"> - Descriptive statistics to identify and rank barriers. - Chi-square tests to compare barrier selection between Title I and non-Title I schools. - Logistic regression to determine whether teacher demographics (experience, certification, gender) predict the likelihood of reporting specific barriers. 	
3. How often do teachers use technology to improve teaching and learning, and is there a difference based on demographic factors?	<p>In the setting where I work with children.... (Daily, Weekly, Monthly, at least once per Semester, Never)</p> <ol style="list-style-type: none"> 1. I consult professional resources to identify research-based practices I can use in teaching technology. 2. I evaluate technology resources for student use (e.g., websites). 3. I design technology-enhanced, learner-centered lessons (e.g., project-based learning). 4. I apply performance-based student assessment in technology-enhanced lessons (e.g., portfolios, presentations). 5. I use technology to analyze student assessment data. 6. I use technology to differentiate instruction for students with special learning needs. 	<ul style="list-style-type: none"> - Descriptive statistics (means, frequencies) to summarize reported frequency of use. 	Title I status, Years of experience, Gender, Level of certification

	<p>7. I use technology to support my professional productivity.</p> <p>8. I use technology to collaborate with families about student learning.</p> <p>9. I use technology to collaborate with other educators.</p> <p>10. My lesson plans align with both content and technology standards.</p> <p>11. I conduct research activities to improve technology-enhanced classroom practices.</p> <p>12. I use multiple sources of data for reflecting on professional practice.</p> <p>13. I use multiple sources of data to make decisions about the use of technology.</p> <p>14. I use technology to participate in professional development (e.g., online workshops, hands-on training).</p> <p>15. I am applying measures to enhance online security and safety.</p>		
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Conclusion

This chapter outlined the research methodology, including the study design, data collection procedures, instrumentation, validity and reliability measures, and analytical techniques used to examine the digital divide in secondary education. Ethical considerations and study limitations were also discussed. The following chapter presents the results of the data analysis

Chapter 4

Results

The purpose of this study was to examine the availability and use of digital devices and tools in secondary education classrooms across South Alabama. Data were collected using the Infrastructure, Support, Barriers, and Technology (ISBT) Survey (Appendix A), which was administered to secondary school teachers in Title I and non–Title I schools. The survey consisted of four sections: (a) infrastructure and staff support, (b) teacher-perceived barriers to technology integration, (c) frequency of technology use, and (d) demographic characteristics.

This chapter presents the results of the quantitative data analyses conducted to address the study’s three research questions. Descriptive and inferential statistical procedures were used to analyze the data collected from each section of the survey. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize teachers’ responses and identify overall trends related to technology access, barriers, and usage.

Research Question 1

Are there significant differences in technological access and integration based on demographic factors such as Title I status, school classification, and school rating?

Descriptive Statistics for Technological Access

Descriptive statistics were calculated to summarize teachers’ perceptions of technological access and infrastructure support. Overall, teachers reported moderate to high levels of access to technological resources in their schools. Mean scores across the infrastructure ranged from 2.91 to 3.32 on the four-point Likert type scale.

The highest rated item was internal school communication systems ($M = 3.32, SD = 0.80$), followed closely by productivity software ($M = 3.29, SD = 0.80$) and family communication

systems ($M = 3.29$, $SD = 0.76$). In contrast, the lowest rated item was access to a technology director ($M = 2.91$, $SD = 0.88$), followed by technology support ($M = 2.95$, $SD = 0.89$) and web access not being blocked ($M = 2.96$, $SD = 0.91$). These findings indicate that while most teachers perceived strong access to technology tools and communication systems, slightly lower perceptions were reported regarding technology support personnel (see Table 6).

Table 6

Descriptive Statistics for Technological Access Items

Technological Access Item	<i>n</i>	<i>Mean</i>	<i>SD</i>
Internal communication systems	101	3.32	0.80
Productivity software available	99	3.29	0.80
Family communication systems	99	3.29	0.76
Enough computers available	101	3.27	0.97
Reliable internet access	101	3.20	0.88
Library/media coordinator available	101	3.16	0.89
Sufficient hardware devices	101	3.12	0.91
Fast internet speed	101	3.11	0.92
Ongoing technology support	101	3.06	0.80
Ongoing professional development	101	3.04	0.81
Web access not blocked	100	2.96	0.91
Technology support available	101	2.95	0.89
Technology director available	101	2.91	0.88

Note. Likert-type scale used 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree.

Differences Based on Title I Status

Chi-square analyses were conducted to determine whether teachers' perceptions of technological infrastructure differed between Title I and non–Title I schools. Results indicated that several infrastructure items showed statistically significant differences between the two groups. A statistically significant difference was found between Title I status and the perception that schools had enough computers available for instructional use, $\chi^2(3, n = 99) = 10.79, p = .013$. Teachers in Title I schools were more likely to report agreement that sufficient computers were available compared to teachers in non–Title I schools.

A significant association was also found for sufficient hardware resources, $\chi^2(3, n = 99) = 9.89, p = .020$, indicating that perceptions of available hardware differed between Title I and non–Title I schools.

Additionally, a statistically significant difference was found for the availability of a library or media coordinator, $\chi^2(3, n = 99) = 14.80, p = .002$. Teachers in Title I schools were more likely to report having access to a library or media coordinator compared to teachers in non–Title I schools.

Another statistically significant difference was identified for productivity software availability, $\chi^2(3, n = 97) = 11.52, p = .009$, suggesting that access to productivity tools differed between the two groups. Finally, a statistically significant difference was observed for internal school communication systems, $\chi^2(3, n = 99) = 9.21, p = .027$, indicating that teachers' perceptions of internal communication technologies varied based on Title I status.

However, several infrastructure variables did not demonstrate statistically significant differences between Title I and non–Title I schools. No significant differences were found for reliable internet access, $\chi^2(3, n = 99) = 5.40, p = .145$, or internet speed, $\chi^2(3, n = 99) = 5.48, p =$

.140. Similarly, web filtering policies, $\chi^2(3, n = 98) = 3.94, p = .268$, and technology support availability, $\chi^2(3, n = 99) = 2.03, p = .566$, did not differ significantly between school types.

These findings indicate that while many aspects of technology infrastructure were similar across school contexts, some differences in access to devices, support personnel, and communication systems were associated with Title I status (see Table 7).

Table 7

Chi-Square Results Comparing Technological Access by Title I Status

Infrastructure Item	χ^2	df	<i>p</i>	Cramer's V
Enough computers available	10.79	3	.013*	.330
Sufficient hardware devices	9.89	3	.020*	.316
Reliable internet access	5.40	3	.145	.233
Internet speed	5.48	3	.140	.235
Web access not blocked	3.94	3	.268	.201
Technology support availability	2.03	3	.566	.143
Library/media coordinator availability	14.80	3	.002*	.387
Technology director availability	60.04	3	.110	.247
Productivity software availability	11.52	3	.009*	.345
Ongoing professional development	2.36	3	.502	.154
Ongoing technology support	2.84	3	.418	.169
Family communication systems	7.31	3	.063	.275
Internal communication systems	9.21	3	.027	.305

Note. * $p < .05$.

Summary of Research Question 1 Findings

To examine whether significant differences exist in technological access and integration based on demographic factors (Title I status, school classification, and school rating), descriptive statistics were first analyzed to understand overall perceptions of access. Results indicated that teachers generally reported moderate to high levels of technological access and infrastructure support, with mean scores ranging from 2.91 to 3.32 on a four-point scale.

The highest-rated areas included internal school communication systems, productivity software, and family communication systems, suggesting that teachers perceive strong access to communication and productivity-related tools. In contrast, the lowest-rated areas were access to a technology director, availability of technology support, and fewer restrictions on web access. These lower ratings highlight concerns related to support personnel and access limitations rather than availability of tools.

Overall, the findings suggest that while technological resources are widely available across schools, variations may exist in the level of support and access infrastructure. These differences provide a foundation for further analysis to determine whether disparities are associated with demographic factors such as Title I status, school classification, and school rating.

Research Question 2

Research Question 2 examined the barriers teachers perceived as preventing access to technology in Title I and non–Title I schools.

To address this research question, descriptive statistics were used to identify the most frequently reported barriers to technology access among teachers. Chi-square tests of independence were conducted to determine whether reported barriers differed based on Title I

status. In addition, logistic regression analyses were performed to examine whether teacher demographic characteristics predicted the likelihood of reporting selected barriers.

Descriptive Results: Perceived Barriers to Technology Access

Descriptive statistics were used to identify the most commonly reported barriers to technology access among teachers. The results, presented in Table 8, show that several barriers were reported more frequently than others, indicating key challenges in technological integration.

Table 8

Teacher-Perceived Barriers to Technology Access

Barrier	<i>n</i> (Yes)	% (Yes)
Limited funding	41	40.6
Time constraints	41	40.2
Limited student digital literacy	40	39.2
Restricted by school policies	26	25.5
Limited teacher digital literacy	25	24.5
Lack of available devices	19	18.6
Lack of confidence/self-efficacy	19	18.6
Lack of motivation/interest	17	16.7
Outdated/incompatible technology	15	14.7
Limited belief in technology’s value	15	14.7
Insufficient internet	14	13.7

Barrier	<i>n</i> (Yes)	% (Yes)
Inadequate technical support	12	11.8
Resistance to change	12	11.8
Other	12	11.8
Fear of losing control	10	9.8
Negative past experiences	8	7.8

Note. N = 101. Values represent the number and percentage of teachers who selected each barrier.

The most commonly identified barriers were limited funding and time constraints, each reported by 40.2% of participants. Closely following these were limited student digital literacy (39.2%), suggesting that both resource limitations and student readiness play a significant role in hindering effective technology use.

Moderately reported barriers included restricted access due to school policies (25.5%) and limited teacher digital literacy (24.5%). These findings indicate that both institutional factors and teacher skill levels contribute to challenges in technology integration.

Other barriers were reported less frequently, including lack of available devices and lack of confidence or self-efficacy (both 18.6%), as well as lack of motivation or interest (16.7%). Additional concerns such as outdated or incompatible technology and limited belief in the value of technology were each reported by 14.7% of participants.

Barriers related to infrastructure and support, such as insufficient internet access (13.7%) and inadequate technical support (11.8%), were reported at lower levels. Similarly, attitudinal

barriers including resistance to change (11.8%), fear of losing control (9.8%), and negative past experiences (7.8%) were among the least frequently reported.

Overall, these findings suggest that structural and resource-related barriers, particularly funding, time, and student digital readiness, were more prominent than personal or attitudinal factors. This pattern indicates that challenges in technology access are largely influenced by systemic conditions rather than individual teacher resistance.

Differences by Title I Status: Chi-Square

Chi-square tests of independence were conducted to examine whether teachers’ perceptions of barriers to technology access differed based on Title I status. The results of these analyses are presented in Table 9.

Table 9

Chi-Square Tests for Barriers by Title I Status

Barrier	χ^2	df	<i>p</i>	Cramer’s V
Limited funding	3.01	1	.083	.17
Lack of devices	1.42	1	.234	.12
Insufficient internet	2.47	1	.116	.16
Inadequate tech support	2.79	1	.095	.17
Outdated technology	2.20	1	.138	.15
Restricted policies	0.68	1	.409	.08
Limited teacher digital literacy	0.64	1	.422	.08
Limited student digital literacy	1.31	1	.253	.11
Lack of confidence	0.48	1	.489	.07

Barrier	χ^2	df	<i>p</i>	Cramer's V
Limited belief in tech value	0.33	1	.564	.06
Resistance to change	0.28	1	.598	.05
Lack of motivation	0.42	1	.518	.07
Time constraints	1.42	1	.234	.12
Fear of losing control	0.23	1	.634	.05
Negative experiences	0.18	1	.674	.04

Note. $p < .05$.

The findings indicated that there were no statistically significant differences in any of the reported barriers between teachers in Title I and non–Title I schools. Specifically, barriers such as limited funding, $\chi^2(1) = 3.01, p = .083$; lack of available devices, $\chi^2(1) = 1.42, p = .234$; and insufficient internet access, $\chi^2(1) = 2.47, p = .116$, did not differ significantly by school type. Also, no significant differences were observed for inadequate technical support, $\chi^2(1) = 2.79, p = .095$; outdated technology, $\chi^2(1) = 2.20, p = .138$; or restrictions related to school policies, $\chi^2(1) = 0.68, p = .409$.

Teacher-related barriers also showed no significant variation across groups, including limited teacher digital literacy, $\chi^2(1) = 0.64, p = .422$; limited student digital literacy, $\chi^2(1) = 1.31, p = .253$; lack of confidence, $\chi^2(1) = 0.48, p = .489$; and limited belief in the value of technology, $\chi^2(1) = 0.33, p = .564$. In addition, attitudinal and motivational barriers such as resistance to change, $\chi^2(1) = 0.28, p = .598$; lack of motivation, $\chi^2(1) = 0.42, p = .518$; time constraints, $\chi^2(1) = 1.42, p = .234$; fear of losing control, $\chi^2(1) = 0.23, p = .634$; and negative past

experiences, $\chi^2(1) = 0.18, p = .674$, were also not statistically different between Title I and non-Title I schools.

Although none of the results reached statistical significance, effect sizes (Cramer's V) were generally small, indicating weak associations between Title I status and the likelihood of reporting specific barriers. Overall, these findings suggest that perceived barriers to technology access are largely consistent across school contexts, regardless of Title I designation. This indicates that challenges related to technology integration may be system-wide rather than specific to a particular type of school.

Logistic Regression Analysis

Purpose of the Analysis

To further examine Research Question 2, binary logistic regression analyses were conducted to determine whether teacher demographic variables years of experience, certification level, and gender predicted the likelihood of reporting specific barriers to technology access. Logistic regression was selected because the dependent variables were dichotomous (0 = No, 1 = Yes), representing whether each barrier was reported.

Category Collapsing and Recoding Procedures

Prior to analysis, variables were screened and recoded to ensure statistical validity and model stability. Several demographic variables contained small subgroup sizes, which violated assumptions required for logistic regression.

Years of teaching experience were collapsed into two categories (0–10 years and 11 or more years) to increase cell sizes and reduce sparsity. Certification levels were recoded into two groups: standard certification (Class B, Class A, Class AA) and non-standard certification

(emergency and provisional). Gender was also reviewed, and categories with extremely low frequencies were removed or recoded to ensure meaningful group comparisons.

Additionally, barrier variables were coded as binary outcomes (0 = not selected, 1 = selected). These procedures improved the distribution of data and reduced issues related to sparse cells and model instability.

Assessment of Variable Stability

Prior to conducting logistic regression, cross-tabulation analyses were performed to evaluate whether each barrier variable met the assumptions required for inclusion. Variables were classified as stable, optional, or unstable based on the following criteria (see Table 10-12):

- Presence of both outcome categories (0 and 1)
- Adequate cell counts (generally ≥ 10 cases per category)
- Absence of empty cells in cross-tabulations
- Ability of the model to converge without estimation errors

Table 10

Stable Barrier Variables Included in Logistic Regression Analysis

Barrier Variable	Frequency (Yes)	Justification
Limited funding	41	Adequate variability; model converged successfully
Lack of available devices	19	Acceptable distribution; no convergence issues
Insufficient internet connectivity	14	Model converged; stable estimates
Limited student digital literacy	40	High frequency; balanced distribution

Barrier Variable	Frequency (Yes)	Justification
Lack of confidence/self-efficacy	19	Meets logistic regression assumptions

Note. Frequency (Yes) represents the number of participants who selected each barrier (coded as 1 = Yes, 0 = No). Only variables that demonstrated adequate variability and met logistic regression assumptions, including sufficient cell counts and model convergence, were included in the analysis.

Table 11

Optional Barrier Variables Considered for Logistic Regression Analysis

Barrier Variable	Frequency (Yes)	Justification
Lack of motivation/interest	17	Moderate frequency; included if model converged
Limited belief in technology value	15	Limited variability; borderline stability
Outdated/incompatible technology	15	Potential imbalance across predictors

Note. Frequency (Yes) represents the number of participants who reported each barrier (1 = Yes, 0 = No). Variables were classified as optional due to moderate frequencies and potential concerns related to small cell sizes or limited variability. These variables were included in logistic regression analyses only when model assumptions were met and convergence was achieved.

Table 12*Unstable Barrier Variables Excluded from Logistic Regression Analysis*

Barrier Variable	Frequency (Yes)	Justification
Inadequate technical support	12	Sparse data; model failed to converge
Restricted by school policies	26	Extreme coefficients; unstable estimates
Limited teacher digital literacy	25	Uneven distribution across groups
Time constraints	41	Separation issues; model instability
Resistance to change	12	Low variability; sparse data
Fear of losing control	10	Insufficient cell counts
Negative past experiences	8	Extremely low frequency; unreliable estimates
Other	12	Inconsistent responses; undefined category

Note. Frequency (Yes) represents the number of participants who reported each barrier (coded as 1 = Yes, 0 = No). Variables were excluded from logistic regression analyses due to violations of model assumptions, including sparse data, insufficient cell counts, uneven distributions, and failure of model convergence.

Rationale for Inclusion and Exclusion of Variables

Barrier variables that demonstrated stable distributions and successful model convergence were retained for logistic regression analysis. These variables provided reliable parameter estimates and met all statistical assumptions. Optional variables were included only when models converged and produced interpretable results. However, due to borderline distributions, these variables were interpreted with caution.

Unstable variables were excluded from logistic regression analyses due to issues such as sparse data, empty cells, and nonconvergence. Including these variables would have produced unreliable and invalid results. Despite their exclusion from inferential analyses, unstable variables were still examined descriptively to provide a comprehensive understanding of perceived barriers.

Logistic Regression Results

Binary logistic regression analyses were conducted for each stable barrier variable to determine whether teacher demographics predicted the likelihood of reporting specific barriers. Across all models, the results indicated that teacher demographic variables years of experience, certification level, and gender were not statistically significant predictors of reported barriers ($p > .05$). The overall models were not statistically significant, and the explained variance, as indicated by Cox and Snell R^2 and Nagelkerke R^2 values, was low (see Table 15).

Table 13

Summary of Logistic Regression Results for Stable Barrier Variables

Barrier Variable	Predictor	<i>B</i>	<i>SE</i>	Wald	<i>p</i>	Exp(<i>B</i>)	95% CI
Limited funding	Experience	-0.705	0.563	1.566	.211	0.494	[0.164, 1.490]
	Certification	-0.552	0.870	0.403	.526	0.576	[0.105, 3.169]
	Gender	0.432	0.439	0.969	.325	1.540	[0.652, 3.639]
Lack of devices	Experience	-0.313	0.681	0.212	.645	0.731	[0.193, 2.774]
	Certification	0.732	0.920	0.632	.426	2.079	[0.342, 12.630]
	Gender	-0.545	0.540	1.019	.313	0.580	[0.201, 1.671]
Insufficient internet	Experience	0.740	0.939	0.621	.431	2.096	[0.333, 13.208]

Barrier Variable	Predictor	<i>B</i>	<i>SE</i>	Wald	<i>p</i>	Exp(<i>B</i>)	95% CI
Student digital literacy	Certification	0.425	1.304	0.106	.745	1.529	[0.119, 19.705]
	Gender	0.227	0.578	0.154	.695	1.254	[0.404, 3.892]
	Experience	0.579	0.614	0.890	.345	1.784	[0.536, 5.942]
	Certification	0.447	0.903	0.246	.620	1.564	[0.267, 9.179]
	Gender	0.781	0.460	2.882	.090	2.183	[0.886, 5.375]
	Experience	-0.628	0.642	0.956	.328	0.534	[0.152, 1.880]
Confidence/self-efficacy	Certification	0.022	0.978	0.001	.982	1.023	[0.150, 6.952]
	Gender	0.346	0.457	0.575	.448	1.414	[0.578, 3.461]
	Experience	-0.628	0.642	0.956	.328	0.534	[0.152, 1.880]

Note. *B* = logit coefficient; *SE* = standard error; Exp(*B*) = odds ratio; CI = confidence interval. *p*

< .05 indicates statistical significance.

Interpretation of Findings

The results of the logistic regression analyses indicate that teacher demographic characteristics did not significantly predict the likelihood of reporting barriers to technology access. This suggests that the barriers identified in this study are not specific to particular demographic groups but are instead broadly experienced across teachers.

These findings aligned with earlier descriptive results, which indicated that structural barriers such as limited funding, time constraints, and student digital literacy were more prominent than individual-level factors. The lack of significant predictors further supports the conclusion that barriers to technology integration are systemic in nature rather than dependent on teacher characteristics.

In summary, logistic regression analyses were conducted using only stable barrier variables that met statistical assumptions. Category collapsing and recoding procedures improved data quality and ensured model stability. While several variables were excluded due to instability, the final models provided clear evidence that teacher demographics did not significantly influence the likelihood of reporting barriers to technology access.

Summary of Research Question 2 Findings

Research Question 2 examined the barriers teachers perceived as preventing access to technology in Title I and non-Title I schools. The findings from descriptive statistics, chi-square analyses, and logistic regression provided a comprehensive understanding of these barriers.

Descriptive results indicated that the most frequently reported barriers were limited funding, time constraints, and limited student digital literacy, suggesting that structural and resource-related challenges were the most prominent obstacles to technology access. Moderate barriers included restricted access due to school policies and limited teacher digital literacy, while attitudinal barriers such as resistance to change, fear of losing control, and negative past experiences were reported less frequently.

Chi-square analyses were conducted to examine differences in barrier reporting between Title I and non-Title I schools. The results indicated that there were no statistically significant differences in the frequency of reported barriers between the two groups ($p > .05$). This finding suggests that teachers across both school contexts experienced similar challenges in accessing and integrating technology.

Logistic regression analyses were performed to determine whether teacher demographics, including years of experience, certification level, and gender, predicted the likelihood of reporting specific barriers. The results revealed that none of the demographic variables were

statistically significant predictors of barrier reporting ($p > .05$). These findings indicate that the likelihood of perceiving barriers to technology access was consistent across teachers, regardless of their demographic characteristics.

Overall, the results of Research Question 2 suggest that barriers to technology access are systemic and widely experienced, rather than being influenced by school type or individual teacher characteristics. These findings highlight the importance of addressing structural issues, such as funding, time allocation, and student readiness, to improve equitable access to technology in secondary education.

Research Question 3

How often do teachers use technology to improve teaching and learning, and is there a difference based on demographic factors?

To address this research question, descriptive statistics were used to examine the frequency with which teachers reported using technology for instructional and professional activities. Means and standard deviations were calculated for each technology use item. One-way analysis of variance (ANOVA) was conducted to determine whether differences in technology usage existed based on selected demographic variables, including Title I status, years of experience, gender, and level of certification.

Descriptive Results

Frequency of Technology Use

Descriptive statistics were calculated to determine how frequently teachers reported using technology across a variety of instructional and professional practices. The survey items measured frequency on a six-point scale ranging from 1 (Never) to 5 (Daily).

Overall, teachers reported moderate to high levels of technology use across most activities. The highest reported usage occurred in activities related to collaboration and communication. For example, teachers reported frequent use of technology for educator collaboration ($M = 4.74, SD = 1.34$), productivity tasks such as creating documents or presentations ($M = 4.43, SD = 1.52$), and communication with families ($M = 4.31, SD = 1.41$). Technology was also frequently used for online safety instruction ($M = 4.10, SD = 1.55$) and data analysis to monitor student progress ($M = 4.01, SD = 1.48$).

Moderate levels of technology use were reported for instructional planning and assessment practices. These included evaluating technology resources ($M = 3.41, SD = 1.43$), aligning technology use with academic standards ($M = 3.34, SD = 1.92$), data reflection ($M = 3.28, SD = 1.46$), data-based instructional decisions ($M = 3.21, SD = 1.43$), and performance-based assessments ($M = 3.11, SD = 1.31$).

Lower levels of technology use were observed in activities related to research and professional inquiry. For instance, teachers reported less frequent use of technology for conducting action research ($M = 2.92, SD = 1.48$) and consulting research-based practices ($M = 2.44, SD = 1.15$).

These findings suggest that teachers most commonly use technology for communication, collaboration, and productivity tasks, while technology is used somewhat less frequently for research-based instructional planning activities (see Table 14).

Table 14*Descriptive Statistics for Frequency of Technology Use*

Technology Activity	<i>n</i>	<i>Mean</i>	<i>SD</i>
Educator collaboration	95	4.74	1.34
Productivity tasks	96	4.43	1.52
Family communication	95	4.31	1.41
Online safety instruction	96	4.10	1.55
Data analysis	96	4.01	1.48
Differentiation using technology	95	3.94	1.64
Evaluate technology resources	96	3.41	1.43
Standards alignment	94	3.34	1.92
Data reflection	96	3.28	1.46
Data-based decisions	96	3.21	1.43
Performance-based assessment	94	3.11	1.31
Professional development participation	96	3.06	1.35
Technology-enhanced lessons	96	3.04	1.41
Action research	95	2.92	1.48
Research-based practices	96	2.44	1.15

Note. (*N* = 101) *Likert-type* scale ranged from 1 (Never) to 5 (Daily).

One-Way ANOVA Results

Title I Status

A one-way analysis of variance (ANOVA) was conducted to examine whether the frequency of technology use differed based on school Title I status. The analysis compared teachers in Title I schools and non–Title I schools across multiple instructional and professional technology use practices.

The results indicated that there were several statistically significant differences in technology use based on Title I status. Specifically, significant differences were found for differentiation, $F(1, 92) = 6.89, p = .010$, productivity, $F(1, 93) = 8.06, p = .006$, family communication, $F(1, 92) = 5.70, p = .019$, and online safety, $F(1, 93) = 6.05, p = .016$. These findings suggest that teachers' use of technology in these areas varied depending on whether they were teaching in Title I or non–Title I schools.

The effect sizes for these significant findings were small to moderate, indicating that while differences existed, the magnitude of these differences was not substantial. This suggests that Title I status had a limited but noticeable influence on specific aspects of technological use. For the remaining technology use variables including research-based practices, evaluation of technology resources, technology-enhanced lessons, performance-based assessment, data analysis, educator collaboration, standards alignment, action research, data reflection, data-based decision-making, and participation in professional development no statistically significant differences were observed ($p > .05$). These results indicate that, overall, teachers reported similar levels of technology use across most instructional and professional practices regardless of school type.

Interpretation of Findings

Overall, the findings suggest that differences in technology use based on Title I status were selective rather than widespread. While certain areas such as communication, productivity, and instructional differentiation showed variation, most technological practices were used at similar levels across both groups of teachers.

These results imply that although some contextual differences exist between Title I and non–Title I schools, the overall integration of technology into teaching and learning is relatively consistent across school settings (see Table 15).

Table 15

ANOVA Results for Technology Usage by Title I Status

Technology Use Item	df	<i>F</i>	<i>p</i>	η^2
Research-based practices	(1, 93)	1.76	.187	.019
Evaluate tech resources	(1, 93)	2.00	.161	.021
Tech-enhanced lessons	(1, 93)	1.09	.300	.012
Performance-based assessment	(1, 91)	1.45	.231	.016
Data analysis	(1, 93)	0.93	.339	.010
Differentiation	(1, 92)	6.89	.010*	.070
Productivity	(1, 93)	8.06	.006*	.080
Family communication	(1, 92)	5.70	.019*	.058
Educator collaboration	(1, 92)	1.72	.193	.018
Standards alignment	(1, 91)	0.37	.545	.004

Technology Use Item	df	<i>F</i>	<i>p</i>	η^2
Action research	(1, 92)	0.14	.708	.002
Data reflection	(1, 93)	0.55	.459	.006
Data-based decisions	(1, 93)	2.97	.088	.031
PD participation	(1, 93)	2.78	.099	.029
Online safety	(1, 93)	6.05	.016*	.061

Note. * $p < .05$

Certification Level

A one-way analysis of variance (ANOVA) was conducted to examine whether the frequency of technology use differed based on teachers' certification level. Certification was analyzed using collapsed categories to ensure adequate group sizes and improve the stability of the results.

The findings revealed that there were statistically significant differences in technology use for family communication, $F(1, 92) = 8.05$, $p = .006$, and educator collaboration, $F(1, 92) = 9.69$, $p = .002$. These results indicate that teachers' certification level influenced how frequently they used technology for communication with families and for collaboration with other educators.

The effect sizes for these significant differences were in the moderate range, suggesting that certification level had a meaningful impact on these specific aspects of technology use. Teachers with standard certification appeared to report higher levels of technology use in these areas compared to those with non-standard certification; however, these differences were limited to communication and collaboration practices.

For all other technology use variables including research-based practices, evaluation of technology resources, technology-enhanced lessons, performance-based assessment, data analysis, differentiation, productivity, standards alignment, action research, data reflection, data-based decision-making, participation in professional development, and online safety no statistically significant differences were observed ($p > .05$). These findings indicate that certification level did not influence most instructional uses of technology (see Table 16).

Table 16

ANOVA Results for Frequency of Technology Use by Certification Level (Collapsed)

Technology Use Item	df	<i>F</i>	<i>p</i>	η^2
Research-based practices	(1, 93)	0.28	.601	.003
Evaluate tech resources	(1, 93)	1.87	.174	.020
Tech-enhanced lessons	(1, 93)	0.01	.913	.000
Performance-based assessment	(1, 91)	0.00	.993	.000
Data analysis	(1, 93)	2.65	.107	.028
Differentiation	(1, 92)	1.17	.282	.013
Productivity	(1, 93)	1.66	.200	.018
Family communication	(1, 92)	8.05	.006*	.080
Educator collaboration	(1, 92)	9.69	.002*	.095
Standards alignment	(1, 91)	0.62	.433	.007
Action research	(1, 92)	0.14	.707	.002
Data reflection	(1, 93)	1.15	.285	.012

Technology Use Item	df	<i>F</i>	<i>p</i>	η^2
Data-based decisions	(1, 93)	1.46	.230	.015
PD participation	(1, 93)	1.51	.223	.016
Online safety	(1, 93)	0.05	.827	.001

Note. * $p < .05$

Interpretation of Findings

Overall, the results suggest that the influence of certification level on technology use was limited and context specific. While certification level played a role in communication and collaboration practices, it did not significantly impact the broader integration of technology in instructional activities.

These findings indicate that teachers, regardless of certification level, generally use technology at similar rates for instructional purposes. Differences were more evident in professional and communication-related uses of technology rather than in classroom instructional practices.

Years of Experience

A one-way analysis of variance (ANOVA) was conducted to examine whether the frequency of technology use differed based on teachers' years of experience. Years of experience were analyzed using collapsed categories to ensure sufficient group sizes and improve the reliability of the statistical results.

The findings indicated that there were no statistically significant differences in the frequency of technology use across any of the instructional or professional practices based on years of experience ($p > .05$). This suggests that teachers, regardless of whether they had fewer or more years of experience, reported similar levels of technological use.

Although no variables reached statistical significance, research-based practices approached significance, $F(1, 94) = 3.68, p = .058$. This result suggests a potential trend in which teachers with differing levels of experience may vary slightly in their use of research-based practices; however, this difference was not strong enough to be considered statistically significant.

For all other variables including evaluation of technology resources, technology-enhanced lessons, performance-based assessment, data analysis, differentiation, productivity, family communication, educator collaboration, standards alignment, action research, data reflection, data-based decision-making, participation in professional development, and online safety no statistically significant differences were observed ($p > .05$) (see Table 17).

Table 17

ANOVA Results for Frequency of Technology Use by Years of Experience (Collapsed)

Technology Use Item	df	<i>F</i>	<i>p</i>	η^2
Research-based practices	(1, 94)	3.68	.058	.038
Evaluate tech resources	(1, 94)	0.60	.442	.006
Tech-enhanced lessons	(1, 94)	0.30	.588	.003
Performance-based assessment	(1, 92)	0.02	.886	.000
Data analysis	(1, 94)	0.40	.530	.004
Differentiation	(1, 93)	0.64	.426	.007
Productivity	(1, 94)	0.03	.876	.000
Family communication	(1, 93)	0.90	.345	.010
Educator collaboration	(1, 93)	2.49	.118	.026
Standards alignment	(1, 92)	0.39	.533	.004

Technology Use Item	df	<i>F</i>	<i>p</i>	η^2
Action research	(1, 93)	1.29	.260	.014
Data reflection	(1, 94)	0.74	.393	.008
Data-based decisions	(1, 94)	0.17	.684	.002
PD participation	(1, 94)	0.62	.434	.007
Online safety	(1, 94)	0.26	.613	.003

Note. $p > .05$.

Interpretation of Findings

Overall, the results indicate that years of teaching experience did not significantly influence how frequently teachers used technology. Technology patterns appeared to be consistent across both less experienced and more experienced teachers.

These findings suggest that experience level does not play a major role in determining how teachers integrate technology into their instructional and professional practices. Instead, technological use may be influenced more by other factors, such as school resources, access to technology, or professional expectations, rather than the number of years a teacher has been in the profession.

Gender

A one-way analysis of variance (ANOVA) was conducted to examine whether the frequency of technology use differed based on teacher gender. The analysis compared teachers across gender groups on multiple instructional and professional uses of technology.

The results revealed that there were statistically significant differences in technology use for family communication, $F(2, 92) = 3.39, p = .038$, and educator collaboration, $F(2, 92) = 4.73, p = .011$. These findings indicate that gender was associated with differences in how

frequently teachers used technology for communication with families and for collaboration with colleagues. An examination of technology use by gender revealed that female teachers generally reported higher mean levels of technology use across most instructional and professional practices compared to male teachers. Specifically, females reported higher usage in areas such as evaluating technology resources ($M = 3.59$ vs. 2.75), tech-enhanced lessons ($M = 3.16$ vs. 2.60), data analysis ($M = 4.12$ vs. 3.60), differentiation ($M = 4.09$ vs. 3.25), productivity ($M = 4.59$ vs. 3.75), family communication ($M = 4.49$ vs. 3.58), educator collaboration ($M = 4.95$ vs. 3.95), and online safety practices ($M = 4.27$ vs. 3.60). Male teachers reported slightly higher use in only a few areas, such as research-based practices ($M = 2.50$ vs. 2.41) and professional development participation ($M = 3.10$ vs. 3.07), although these differences were minimal.

The effect sizes for these significant results were in the small to moderate range, suggesting that while gender influenced these areas of technology use, the magnitude of the differences was not large. Teachers differed in their reported use of technology for communication and collaboration, but these differences were limited to specific professional practices.

For the remaining technology use variables including research-based practices, evaluation of technology resources, technology-enhanced lessons, performance-based assessment, data analysis, differentiation, productivity, standards alignment, action research, data reflection, data-based decision-making, participation in professional development, and online safety no statistically significant differences were observed ($p > .05$). These findings suggest that gender did not significantly influence most instructional uses of technology. Several variables approached statistical significance, including productivity ($p = .052$), differentiation ($p = .055$),

and evaluation of technology resources ($p = .062$), indicating potential trends; however, these differences did not meet the threshold for statistical significance (see Table 18).

Table 18

ANOVA Results for Frequency of Technology Use by Gender

Technology Use Item	df	<i>F</i>	<i>p</i>	η^2
Research-based practices	(2, 93)	0.16	.850	.003
Evaluate tech resources	(2, 93)	2.87	.062	.058
Tech-enhanced lessons	(2, 93)	1.25	.292	.026
Performance-based assessment	(2, 91)	0.19	.831	.004
Data analysis	(2, 93)	0.98	.379	.021
Differentiation	(2, 92)	3.00	.055	.061
Productivity	(2, 93)	3.06	.052	.062
Family communication	(2, 92)	3.39	.038*	.069
Educator collaboration	(2, 92)	4.73	.011*	.093
Standards alignment	(2, 91)	0.07	.928	.002
Action research	(2, 92)	0.41	.668	.009
Data reflection	(2, 93)	0.06	.942	.001
Data-based decisions	(2, 93)	1.34	.268	.028
Professional development participation	(2, 93)	0.31	.733	.007
Online safety	(2, 93)	2.48	.089	.051

Note. * $p < .05$

Interpretation of Findings

Overall, the findings suggest that gender had a limited and context-specific influence on technology use. While differences were observed in communication and collaboration practices, most instructional uses of technology were consistent across gender groups.

These results indicate that teachers, regardless of gender, generally integrated technology into their instructional practices at similar levels. Differences in technology use appear to be more related to specific professional tasks rather than broad patterns of instructional use.

Summary of Research Question 3 Findings

Research Question 3 examined how often teachers used technology to support teaching and learning and whether usage differed based on demographic factors such as Title I status, certification level, years of experience, and gender. The findings from descriptive statistics and one-way ANOVA analyses provided insight into both the frequency and patterns of technology use among teachers.

Descriptive results indicated that teachers reported moderate to high levels of technology use overall. The highest levels of use were observed in areas related to educator collaboration, productivity, family communication, and online safety, suggesting that teachers frequently used technology for communication and professional tasks. In contrast, lower levels of use were reported for research-based practices and action research, indicating that these more advanced or reflective instructional uses of technology were less commonly implemented.

The ANOVA results revealed that differences in technology use were selective rather than widespread. Title I status was associated with significant differences in specific areas, including differentiation, productivity, family communication, and online safety, suggesting that school

context influenced certain aspects of technology use. Similarly, certification level and gender were linked to differences in communication and collaboration practices, while years of experience did not result in any statistically significant differences.

Overall, the findings suggest that while teachers generally used technology at similar levels across most instructional practices, differences emerged in specific areas, particularly those related to communication and professional use. These results indicate that technology integration is not uniform across all contexts but rather varies depending on certain school and teacher characteristics. However, the lack of widespread differences across most variables suggests that technology use is relatively consistent among teachers, regardless of demographic background.

Chapter 4 Summary

This chapter presented the results of the data analysis conducted to examine the digital divide in secondary education. The analysis addressed three research questions related to technological access and integration, perceived barriers, and the frequency of technology use among teachers. Descriptive and inferential statistical methods, including chi-square tests, one-way ANOVA, and logistic regression, were used to analyze the data.

For Research Question 1, the findings revealed that there were selective differences in technological access and integration based on school context, particularly between Title I and non–Title I schools. Teachers in non–Title I schools reported higher levels of access to certain technological resources, including computers, hardware, productivity software, and communication systems. However, not all variables showed significant differences, indicating that disparities in access were present but not consistent across all areas. These results suggest

that structural differences in technology availability continue to exist between schools serving different student populations.

For Research Question 2, descriptive statistics identified the most commonly reported barriers to technology access as limited funding, time constraints, and limited student digital literacy. Chi-square analyses indicated that there were no statistically significant differences in the frequency of reported barriers between Title I and non–Title I schools. Additionally, logistic regression results showed that teacher demographic variables, including years of experience, certification level, and gender, were not significant predictors of reported barriers. These findings suggest that barriers to technology access are systemic and widely experienced, rather than being influenced by school type or individual teacher characteristics.

For Research Question 3, descriptive statistics showed that teachers reported moderate to high levels of technology use, with the highest usage observed in areas such as educator collaboration, productivity, family communication, and online safety. Lower levels of use were reported for research-based practices and action research. One-way ANOVA results indicated that differences in technology use were selective and context specific. Title I status, certification level, and gender were associated with differences in certain areas, particularly communication and collaboration practices, while years of experience did not result in significant differences. Overall, the findings suggest that technology use is relatively consistent across most instructional practices, with variation occurring in specific contexts.

Taken together, the results of this chapter indicate that while some differences in access and usage exist, particularly across school contexts, many aspects of technology integration are shared across teachers. The findings highlight that structural factors play a greater role in shaping technology access and barriers, whereas differences in usage are more nuanced and dependent on

specific tasks and contexts. These results provide a foundation for the discussion of findings, implications, and recommendations presented in Chapter 5.

Chapter 5: Discussion, Conclusion, and Recommendations

Introduction

The purpose of this study was to examine the digital divide in secondary education by exploring differences in technological access, perceived barriers, and frequency of technology use among teachers in Title I and non–Title I schools. This chapter presents an interpretation of the findings discussed in Chapter 4, connects the results to existing literature, and explains them through van Dijk’s Digital Divide Framework. In addition, this chapter outlines the limitations of the study, provides conclusions, and offers recommendations for practice and future research.

Discussion of Findings

Research Question 1

Are there significant differences in technological access and integration based on demographic factors such as Title I status, school classification, and school rating?

Research Question 1 examined whether significant differences exist in technological access and integration based on demographic factors such as Title I status, school classification, and school rating. The findings indicated that teachers generally reported moderate to high levels of technological access and infrastructure support across schools. High ratings for communication systems and productivity tools suggest that many schools have established a foundational level of access to essential technology resources.

However, lower ratings for access to technology support personnel, such as technology directors and technical assistance, highlight an important gap in support structures. This suggests that while hardware, software, and communication tools are widely available, the human and

organizational support needed to effectively implement and sustain technology use may be less consistent across schools. These differences in support may influence how effectively teachers are able to integrate technology into their instructional practices.

When examining differences across demographic variables, the results revealed limited but notable variations. While some differences were observed based on Title I status and school characteristics, many aspects of technological access and integration were similar across groups. This suggests that access to technology is becoming more widespread; however, equity in access does not necessarily translate to equity in support or implementation.

These findings align with van Dijk's Digital Divide Theory, which posits that the digital divide is not solely about physical access to technology (first-level divide), but also includes disparities in resources, support, and the ability to effectively use technology. In this study, the relatively strong access to devices and tools reflects progress in addressing the first-level digital divide. However, the lower ratings related to support personnel and infrastructure highlight ongoing challenges associated with deeper levels of digital inequality.

Overall, the findings suggest that while schools have made progress in providing access to technology, disparities remain in the support systems that enable meaningful technology integration. Addressing these gaps will require a focus not only on resource allocation, but also on strengthening infrastructure, staffing, and professional support systems to ensure that all teachers can effectively utilize available technology to enhance teaching and learning.

Research Question 2

What barriers do teachers perceive as preventing access to technology in Title I and non-Title I schools?

The findings for Research Question 2 showed that teachers most commonly identified limited funding, time constraints, and limited student digital literacy as major barriers to technology access. These barriers reflect structural and instructional challenges rather than individual limitations.

Chi-square analyses revealed no significant differences in barrier reporting between Title I and non-Title I schools. In addition, logistic regression results indicated that teacher demographics, including years of experience, certification level, and gender, did not predict the likelihood of reporting barriers. This suggests that these challenges are widely experienced across different school contexts and teacher groups.

From the perspective of Jan van Dijk's framework, these findings reflect both the first-level divide (access to resources) and the second-level divide (skills and usage barriers). Limited funding affects access to technology, while constraints such as time and student readiness influence how effectively technology can be used in the classroom.

The absence of demographic differences highlights that barriers are systemic rather than individual, reinforcing the idea that addressing the digital divide requires structural solutions rather than focusing solely on teacher characteristics.

Research Questions 3

How often do teachers use technology to improve teaching and learning, and are there differences based on demographic factors?

The findings for Research Question 3 indicated that teachers reported moderate to high levels of technology use overall. Technology was used most frequently for communication, collaboration, productivity, and online safety, while lower levels of use were observed for research-based practices and action research.

The ANOVA results showed that differences in technology use were selective and context specific. Title I status, certification level, and gender were associated with differences in certain areas, particularly communication and collaboration practices. However, years of experience did not significantly influence technology use, and most instructional practices showed no significant differences across demographic groups.

These findings align with the second- and third-level digital divide described by Jan van Dijk. While access to technology may be improving, differences remain in how technology is used and the outcomes it produces. Teachers appear to use technology consistently for basic and professional tasks, but less frequently for deeper instructional practices that require higher levels of integration. Overall, the results suggest that technology use is not solely determined by access but is influenced by how teachers apply technology in different contexts.

Conclusion

This study examined the digital divide in secondary education by analyzing differences in technological access, perceived barriers, and the frequency of technology use among teachers in Title I and non–Title I schools. The findings revealed that while some differences in access to technology exist, particularly between school contexts, many aspects of technology use and perceived barriers are shared across teachers regardless of demographic characteristics.

The results indicated that disparities in access are still present, reflecting ongoing structural challenges within schools serving economically disadvantaged populations. However, the absence of significant differences in perceived barriers and the limited influence of teacher demographics suggest that these challenges are not isolated to specific groups but are experienced broadly. Additionally, while teachers reported moderate to high levels of technology

use, differences were primarily observed in specific areas such as communication and collaboration rather than across all instructional practices.

Overall, the findings support the view that the digital divide is a multidimensional and systemic issue, extending beyond simple access to technology. Factors such as funding, time, and student readiness play a critical role in shaping how technology is integrated into teaching and learning. Addressing these challenges requires a comprehensive approach that not only improves access to technological resources but also supports effective and meaningful use in educational settings.

In conclusion, this study contributes to a deeper understanding of the digital divide in secondary education and highlights the need for continued efforts to ensure equitable access and integration of technology for all students and teachers.

Recommendations

Recommendations for Practice

1. Schools should prioritize increased funding and resource allocation to ensure equitable access to technology across all school settings.
2. Teachers should seek out grants to provide funding for classroom technology support.
3. Professional development should focus on helping teachers integrate technology into instructional practices, not just basic use.
4. Schools should provide additional support to address student digital literacy, as it was identified as a major barrier.
5. Administrators should consider strategies to reduce time constraints, allowing teachers more opportunities to effectively integrate technology.

6. Professional development on research design and action research should be offered to empower teachers to become reflective practitioners who analyze their classroom practices.

Recommendations for Future Research

1. Future studies should include a larger and more diverse sample to improve generalizability.
2. Researchers should explore student perspectives on technology access and use.
3. Additional research should examine how technology impacts student learning outcomes.
4. Future studies could use mixed methods approaches to gain deeper insights into how teachers use technology in practice.

Reference

- Afzal, A., Khan, S., Daud, S., Ahmad, Z., & Butt, A. (2023). Addressing the digital divide: Access and use of technology in education. *Journal of Social Sciences Review*, 3(2), 883-895. <https://doi.org/10.54183/jssr.v3i2.326>
- Deklich, W. (2021). *Inequalities in Education / Wesley Deklich. Distributed by ERIC Clearinghouse*
- DeMio, P.R. (2024, July 30). How States and Districts can close the Digital Divide to Increase College and Career Readiness. *Center for American Progress*.
<https://www.americanprogress.org/article/how-states-and-districts-can-close-the-digital-divide-to-increase-college-and-career-readiness/>
- Dijk, J. V. (2017). Digital divide: Impact of access. In P. Rössler (Ed.), *The International Encyclopedia of Media Effects* (pp. 1–11). *John Wiley & Sons*.
<https://doi.org/10.1002/9781118783764.wbieme0043>
- Domanico, R. (2024). Title I is a clunky, overbroad failure: Low-income students deserve better. Manhattan Institute. <https://media4.manhattan-institute.org/wp-content/uploads/title-i-is-a-clunky-overbroad-failure-low-income-students-deserve-better.pdf>
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42(3), 255–284.
- Great Schools Partnership. (n.d.). *The glossary of education reform*. Retrieved from <https://www.edglossary.org/>
- Miah, M. (2024). Digital inequality: The digital divide and educational outcomes. *Tennessee State University*. <https://www.researchgate.net/publication/379258768>

- Mohamed, N. (2022). Every family succeeds: The contrast between Title I and non-Title I schools in terms of limited-English proficient parents' engagement experiences in their children's education. *Journal of Underrepresented and Minority Progress*, 6(2), 73-94.
- National Board for Professional Teaching Standards. (2020). National Board certification: Overview and process. Retrieved from <https://www.nbpts.org>
- National Center for Education Statistics. (2020). *Status and trends in the education of racial and ethnic groups 2020*. U.S. Department of Education.
<https://nces.ed.gov/programs/raceindicators/>
- Opper, I. M. (2019, December 4). Teachers matter: Understanding teachers' impact on student achievement. RAND Corporation.
https://www.rand.org/pubs/research_reports/RR4312.html
- Organization for Economic Co-operation and Development. (n.d.). Digital divide in education. OECD. <https://www.oecd.org/en/topics/digital-divide-in-education.html>
- Pierce, G. L., & Cleary, P. F. (2024). The persistent educational digital divide and its impact on societal inequality. *PLOS ONE*, 19(4), e0286795.
<https://doi.org/10.1371/journal.pone.0286795>
- Smith, R. F. (2023, August 23). Understanding the digital divide in education: Navigating learning inequities. *Robert F. Smith Foundation*. <https://robertsmith.com/blog/digital-divide-in-education/>
- The Education Trust. (2018, February 27). Funding gaps 2018: An analysis of school funding equity across the U.S. and within each state. <https://edtrust.org/resource/funding-gaps-2018/>
- The SERVE Center at University of North Carolina Greensboro (2007). *Student Technology*

Needs Assessment (STNA). Greensboro, NC: Author.

UCLA Center for Neighborhood Knowledge. (2020, December 8). Despite improved access, digital divide persists for minority, low-income students. UCLA Newsroom.

<https://newsroom.ucla.edu/releases/digital-divide-persists-for-minority-low-income-students>

U.S. Census Bureau. (2021). Geographic terms and concepts - County and city classification.

U.S. Department of Commerce. Retrieved from <https://www.census.gov>

U.S. Department of Education. (2020). Digital access, design, and use: Addressing disparities in education technology. <https://www.ed.gov>

U.S. Department of Education. (2018). Improving basic programs operated by local educational agencies (Title I, Part A). Retrieved from

<https://www2.ed.gov/programs/titleiparta/index.html>

U.S. Department of Education. (2023). FY 2023 agency financial report.

<https://www.ed.gov/sites/ed/files/about/reports/annual/2023report/4f-otherinfo-mgmt-perf-challenges.pdf>

Appendix A

Assessing Infrastructure, Barriers, and Technology use in South Alabama Secondary Education Survey

This appendix includes the full survey instrument administered to secondary teachers in South Alabama.

Assessing Infrastructure, Barriers, and Technology use in South Alabama Secondary Education
SECTION 1:

Directions: Please rate your level of agreement with the following statements.

“In my school...”	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I have access to enough computers (in the classroom, lab, or mobile cart) for at least one device per student.				
2. I have sufficient access to hardware (e.g., projectors, printers, digital cameras).				
3. I have reliable internet access.				
4. I have fast internet access.				
5. I have students who can access appropriate web resources without being blocked by unnecessary filters.				

<p>6. I have students who can access appropriate web tools without being blocked by unnecessary filters.</p>				
<p>7. I have easy access to technical support (troubleshooting, maintenance).</p>				
<p>8. I have a library media coordinator who is adequately staffed.</p>				
<p>9. I have a technology assistant who is adequately staffed.</p>				
<p>10. I have access to productivity software (e.g., word processing, slide presentations, graphic organizers).</p>				
<p>11. I have access to ongoing technology-related</p>				

professional development.				
12. I have access to ongoing technology-related support.				
13. I have adequate electronic systems for communicating with families (e.g., email, school web pages).				
14. I have adequate electronic systems for communicating within the school (e.g., email among teachers and staff, network drives, lesson and grade submissions).				

SECTION TWO:

Directions: Which of the following do you consider barriers to effective technology use in your classroom?

Barriers	Select all that apply
1. Limited funding	
2. Lack of available devices (e.g., laptops, tablets)	
3. Insufficient internet connectivity/bandwidth	
4. Inadequate technical support or maintenance	
5. Outdated or incompatible technology	
6. Restricted access due to school policies	
7. Limited digital literacy training for teachers	
8. Limited digital literacy training for students	
9. Lack of confidence/self-efficacy	
10. Limited belief in technology's educational value	
11. Resistance to change	
12. Lack of motivation/interest	
13. Time constraints	
14. Fear of losing control	
15. Negative past experiences	
16. Other (please specify): _____	

SECTION THREE:

Directions: For each statement below, please select how often this occurs.

“In my classroom...”	Never	At least once per semester	Monthly	Weekly	Daily
1. I consult professional resources to identify research-based practices I can use in teaching technology.					
2. I evaluate technology resources for student use (e.g., websites).					
3. I design technology-enhanced, learner-centered lessons (e.g., project-based learning).					
4. I apply performance-based student assessment in technology-enhanced lessons (e.g., portfolios, presentations).					
5. I use technology to analyze student assessment data.					
6. I use technology to differentiate instruction for students with special learning needs.					
7. I use technology to support my professional productivity.					
8. I use technology to collaborate with families about student learning.					
9. I use technology to collaborate with other educators.					

10. My lesson plans align with both content and technology standards.					
11. I conduct research activities to improve technology-enhanced classroom practices.					
12. I use multiple sources of data for reflecting on professional practice.					
13. I use multiple sources of data to make decisions about the use of technology.					
14. I use technology to participate in professional development (e.g., online workshops, hands-on training).					
15. I apply measures to enhance online security and safety.					

SECTION FOUR:

1. What is your gender?

Male

Female

Non-binary

Prefer to self-describe: _____

Prefer not to answer.

2. What is your age range?

Under 25

25–34

35–44

45–54

55–64

65 or older

3. How would you describe your ethnicity? (Select all that apply)

American Indian or Alaska Native

Asian

Black or African American

Hispanic or Latino

Native Hawaiian or Pacific Islander

White

Another race or ethnicity: _____

Prefer not to answer.

4. How would you describe your experience using technology in your professional role?

Beginner: I'm just getting started and learning the basics.

Intermediate: I'm comfortable using most tools and platforms.

Advanced: I use technology regularly and can troubleshooting or train others

Expert: I lead or design technology-based projects or solutions.

5. Is your school classified as a Title 1 school, meaning it receives federal funding to support students from low-income families?

Yes

No

6. How many years of experience do you have in your current role?

0-5 years

6-10 years

11-15 years

16-20 years

21+ years

7. What is your teacher certification level?

Class B

Class A

Class AA

Emergency Certification

Provisional Certification

Other

8. What is the grade level of your school? Check all that apply.

6th

7th

8th

9th

10th

11th

12th

9. What is your school's most recent performance rating based on your state's accountability system?

(Please select the option that best represents your school's official rating.)

passing

failing

Appendix B

Email Request for Research Permission

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Sent: Wednesday, August 6, 2025 8:49 PM
To: Sanderson, Edward/Murphy High <esanderson@mcpss.com>
Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Edward Sanderson,

I hope this message finds you well. Ms. Salter mentioned that she would inform you I would be reaching out. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

If granted permission, I would provide a survey link to be shared through your district's communication system. The survey will take approximately 10–15 minutes to complete, and it will not collect any names or personally identifiable information. All responses will remain anonymous and confidential. I will adhere to all district policies as well as Auburn University's and IRB research guidelines throughout the process.

Your support would be invaluable to this research and would help amplify the voices of educators in your district. The findings may also serve as a resource for informing future decisions related to technology access and equity in education.

Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,
Katrina Billups
Doctoral Candidate, Auburn University
kzb0037@tigermail.auburn.edu | (251)295-0447

Katrina Billups

Clark-Shaw Magnet

of Math, Science and Technology

Career Technology Teacher

Information Technology Academy

(251) 221-2106 Ext. 20775

Appendix C

Approval Email Responses: Requesting Research Permission



RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Sanderson, Edward/Murphy High <esanderson@mcpss.com>

Date Thu 8/7/2025 1:13 PM

To Billups, Katrina M/Clark-Shaw Magnet kbillups@mcpss.com

Sounds good. Let me know the date and we can move forward with it.

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Sent: Thursday, August 7, 2025 12:39 PM

To: Sanderson, Edward/Murphy High <esanderson@mcpss.com>

Subject: Re: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

I would like to send the survey out next month.

From: Sanderson, Edward/Murphy High <esanderson@mcpss.com>

Sent: Thursday, August 7, 2025 11:13 AM

To: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Subject: RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Good Morning Ms. Billips,

Congratulations on your efforts in pursuing your doctorate degree. When would you like to send out this survey?

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Sent: Wednesday, August 6, 2025 8:49 PM

To: Sanderson, Edward/Murphy High <esanderson@mcpss.com>

Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Edward Sanderson,

I hope this message finds you well. Ms. Salter mentioned that she would inform you I would be reaching out. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research. 1/2

9/21/25, 12:29 PM RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research - Billups, Katrina M/Clark-Shaw Magne... The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

If granted permission, I would provide a survey link to be shared through your district's communication system. The survey will take approximately 10–15 minutes to complete, and it will not collect any names or personally identifiable information. All responses will remain anonymous and confidential. I will adhere to all district policies as well as Auburn University's and IRB research guidelines throughout the process.

Your support would be invaluable to this research and would help amplify the voices of educators in your district. The findings may also serve as a resource for informing future decisions related to technology access and equity in education.

Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,
Katrina Billups
Doctoral Candidate, Auburn University
kzb0037@tigermail.auburn.edu | (251)295-0447

Katrina Billups

Clark-Shaw

Magnet of

Math,

Science

and

Technology

Career

Technology

Teacher

Information Technology Academy

(251) 221-2106 Ext. 20775

9/21/25, 12:25 PM RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research - Billups, Katrina M/Clark-Shaw Magne...



RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Reed, Randall D./Citronelle High <rreed@mcpss.com>
Date Thu 8/7/2025 7:10 AM
To Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Good morning Mrs. Billups.

Thank you for reaching out regarding your research and survey request. I don't mind at all if you shared the survey link with us. I wish you much success.

Sincerely,



CONFIDENTIALITY NOTICE

This e-mail is intended for the sole use of the individual(s) to whom it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law. You are hereby notified that any dissemination, duplication, or distribution of this transmission by someone other than the intended addressee or its designated agent is strictly prohibited. If you receive this e-mail in error, please notify me immediately by replying to this e-mail.

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Sent: Wednesday, August 6, 2025 8:36 PM
To: Reed, Randall D./Citronelle High <rreed@mcpss.com>
Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Randall Reed,

I hope this message finds you well. My name is Katrina Billups and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

If granted permission, I would provide a survey link to be shared through your district's communication system. The survey will take approximately 10–15 minutes to complete, and it will not collect any names or personally identifiable information. All responses will remain

about:blank 1/2 9/21/25, 12:25 PM RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research - Billups, Katrina M/Clark-Shaw Magne...

anonymous and confidential. I will adhere to all district policies as well as Auburn University's and IRB research guidelines throughout the process.

Your support would be invaluable to this research and would help amplify the voices of educators in your district. The findings may also serve as a resource for informing future decisions related to technology access and equity in education.

Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,
Katrina Billups
Doctoral Candidate, Auburn University
kzb0037@tigermail.auburn.edu | (251)295-0447

Katrina Billups

Clark-Shaw
Magnet of
Math,
Science
and
Technology
Career

Technology
Teacher
Information Technology Academy
(251) 221-2106 Ext. 20775



RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Laffitte, Jason D/Faulkner Career Tech Center <jdlaffitte@mcpss.com>

Date Wed 8/13/2025 10:10 AM

To Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Good Morning,

This will be fine. Will this be sent to teachers at this school?

Jason D. Laffitte, Ed.D.

Principal Faulkner Career Technical Center

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Sent: Wednesday, August 6, 2025 8:42 PM

To: Laffitte, Jason D/Faulkner Career Tech Center <jdlaffitte@mcpss.com>

Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Jason Laffitte,

I hope this message finds you well. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges

teachers face with technology access and the strategies they use to support students in their classrooms.

If granted permission, I would provide a survey link to be shared through your district's communication system. The survey will take approximately 10–15 minutes to complete, and it will not collect any names or personally identifiable information. All responses will remain anonymous and confidential. I will adhere to all district policies as well as Auburn University's and IRB research guidelines throughout the process.

Your support would be invaluable to this research and would help amplify the voices of educators in your district. The findings may also serve as a resource for informing future decisions related to technology access and equity in education.

Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,
Katrina Billups

about:blank 1/29/21/25, 12:37 PM RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research - Billups, Katrina M/Clark-Shaw Magne...

Doctoral Candidate, Auburn University
kzb0037@tigermail.auburn.edu | (251)295-0447

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Mrs. Buchanan



Thursday, Jul 24 • 11:20 AM

RCS chat with Mrs. Buchanan

Good morning, Ms. Buchanan,
I hope you've been doing well. This is Mrs. Billups. I'm currently working on my dissertation, which focuses on the digital divide in education. I was wondering if you would be open to allowing me to survey the teachers at your school. I will follow up with an email that includes the details and a formal request for approval.
Thank you in advance for your support

Thursday, Jul 24 • 2:21 PM

Good afternoon. Yes ma'am. Keep me posted.

Thank you

2:24 PM [🔒]



RCS message



Re: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Jason Petro <jpetro@accelacademymobile.com>

Date Mon 6/23/2025 7:54 AM

To Katrina Billups <kzb0037@auburn.edu>

Ms. Billups,

I apologize for not getting back to you sooner. Ms. Gould can be reached at jgould@accelacademymobile.com and Dr. Stringer can be reached at jstringer@accelacademymobile.com. I know Dr. Stringer is out of the office this week.

Jason Petro

On Wed, Jun 11, 2025 at 6:10 PM Katrina Billups <kzb0037@auburn.edu> wrote:
Yes, that is fine. Will you be able to give me Ms. Gould and Dr. Stringer email address?

From: Jason Petro <jpetro@accelacademymobile.com>

Sent: Wednesday, June 11, 2025 4:26 PM

To: Katrina Billups <kzb0037@auburn.edu>

Subject: Re: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Ms. Billups,

When I spoke to Ms. Lewis, I understood you would only be sending the survey to our CTE instructors. You would have to email Ms. Gould and Dr. Stringer for permission to send to all middle school and high school teachers respectively.

Sincerely,
Jason Petro

On Wed, Jun 11, 2025 at 2:13 PM Katrina Billups <kzb0037@auburn.edu> wrote:

Dear Mr. Petro,

I hope this message finds you well. My name is Katrina Billups, and I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

If granted permission, I would provide a survey link to be shared through your district's communication system. The survey will take approximately 10–15 minutes to complete, and it will not collect any names or personally identifiable information. All responses will remain anonymous and confidential. I will adhere to all district policies as well as Auburn University's and IRB research guidelines throughout the process.

Your support would be invaluable to this research and would help amplify the voices of educators in your district. The findings may also serve as a resource for informing future decisions related to technology access and equity in education.

Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,

Katrina Billups

Doctoral Candidate, Auburn University

kzb0037@tigermail.auburn.edu | (251)295-0447

--

Jason Petro
ACCEL Academy CTE

--

Jason Petro
ACCEL Academy CTE



Re: Survey Approval (Dissertation)

From Taylor-Jackson, Timesha L/Clark-Shaw Magnet <tltaylor@mcpss.com>

Date Thu 8/7/2025 7:18 PM

To Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Mrs. Billups,

Yes, I approve your request for distribution of a teacher survey for educational purposes.

Timesha Taylor-Jackson

Clark-Shaw Magnet School

5960 Arlberg Street

Mobile, Alabama 36608

251-221-2106

office 251-

221-2107 fax

tltaylor@mcp

ss.com

A person who never made a mistake never tried anything new.

Albert Einstein

LEARNING TODAY. LEADING TOMORROW. 
Mobile County
PUBLIC SCHOOLS

From: Billups, Katrina M/Clark-Shaw Magnet
<kbillups@mcpss.com>
Sent: Thursday, August 7, 2025 6:15 PM
To: Taylor-Jackson, Timesha L/Clark-Shaw Magnet
<tltaylor@mcpss.com> **Subject:** Survey Approval
(Dissertation)

Dear Mrs. Taylor Jackson,

I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–9th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

<https://outlook.office.com/mail/id/AAkALgAAAAAHYQDEapmEc2byACqAC%2FEWg0ALdynt9fpgUW1BL46sds%2FhQAGkL009gA>
A 1/2 9/21/25, 12:39 PM Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook

If granted permission, I would provide a survey link to be shared through your district’s communication system. The survey will take approximately 10–15 minutes to complete, and it will not collect any names or personally identifiable information. All responses will remain anonymous and confidential. I will adhere to all district policies as well as Auburn University’s and IRB research guidelines throughout the process.

Your support would be invaluable to this research and would help amplify the voices of educators in your district. The findings may also serve as a resource for informing future decisions related to technology access and equity in education.

Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,

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and
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y Career
Technolog
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Information Technology Academy
(251) 221-2106 Ext. 20775



Re: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Billups, Katrina M/Clark-Shaw Magnet
<kbillups@mcpss.com>

Date Mon 8/11/2025 6:13 PM

To Boucher, Todd E./Grand Bay Middle

<toucher@mcpss.com>

Great, thank you so much!

From: Boucher, Todd E./Grand Bay Middle <toucher@mcpss.com>

Sent: Thursday, August 7, 2025 4:04 PM

To: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Subject: Re: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Good afternoon,

Thank you for reaching out and I am okay with you sending your survey to my staff.

Best of luck.

Todd

--

Todd Boucher, Ph.D.
Principal

Grand Bay
Middle
School 12800
Cunningham
Rd.
Grand Bay, AL 36541
(251) 865-6511



From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Sent: Wednesday, August 6, 2025 6:44 PM
To: Boucher, Todd E./Grand Bay Middle <tboucher@mcpss.com>
Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Todd Burcher,

<https://outlook.office.com/mail/id/AAkALgAAAAAHYQDEapmEc2byACqAC%2FEWg0ALdynt9fpgUW1BL46sds%2FhQAGkz0tZwA>
A 1/2 9/21/25, 12:40 PM Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook

I hope this message finds you well. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

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for informing future decisions related to technology access and equity in education.

Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,
Katrina Billups
Doctoral Candidate, Auburn University
kzb0037@tigermail.auburn.edu | (251)295-0447

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Information Technology Academy
(251) 221-2106 Ext. 20775

9/21/25, 12:41 PM

Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook



RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Patterson, James N/Mobile County Training <jpatterson@mcpss.com>

Date Thu 8/7/2025 11:00 AM

To Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Good morning,

You have my permission to distribute your survey.

Thanks,

James N. Patterson Jr.

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Sent: Wednesday, August 6, 2025 5:58 PM

To: Patterson, James N/Mobile County Training <jpatterson@mcpss.com>

Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. James Patterson,

I hope this message finds you well. Mrs. Jackson mentioned that she would inform you I would be reaching out. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

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Please feel free to contact me if you have any questions or need additional information. Thank you for your time and consideration.

Sincerely,
Katrina Billups

<https://outlook.office.com/mail/id/AAkALgAAAAAHYQDEapmEc2byACqAC%2FEWg0ALdynt9fpgUW1BL46sds%2FhQAGkLz2%2FwAA>

1/2

9/21/25, 12:41 PM Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook **Doctoral**
Candidate, Auburn University
kzb0037@tigermail.auburn.edu | (251)295-0447

Katrina Billups

Clark-Shaw

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and

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Teacher

Information Technology Academy

(251) 221-2106 Ext. 20775

9/21/25, 12:43 PM

Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook



Outlook

Re: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Smith, Jason/Causey Middle <jasonsmith@mcpss.com>
Date Wed 8/6/2025 7:07 PM
To Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Yes, I will email to my teachers when you send it to me

Get [Outlook for iOS](#)

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Sent: Wednesday, August 6, 2025 6:29:58 PM
To: Smith, Jason/Causey Middle <jasonsmith@mcpss.com>
Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Jason Smith,

I hope this message finds you well. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

The focus of my study is to examine how access to technology differs across schools and how these differences impact teaching and learning in Title I and non-Title I schools. I am especially interested in understanding the challenges teachers face with technology access and the strategies they use to support students in their classrooms.

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Katrina Billups

Doctoral Candidate, Auburn University

kzb0037@tigermail.auburn.edu | (251)295-0447

<https://outlook.office.com/mail/Id/AAkALgAAAAAHYQDEapmEc2byACqAC%2FEWg0ALdynt9fpgUW1BL46sds%2FhQAGj94DzQAA>
1/2 9/21/25, 12:43 PM Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook

Katrina Billups

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Re: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Williams, Craig O/Washington Middle <cowilliams@mcps.com>

Date Wed 8/6/2025 6:22 PM

To Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcps.com>

Im good as long as you have it cleared through central office.

Sent from my Verizon, Samsung Galaxy
smartphone Get [Outlook for Android](#)

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcps.com>

Sent: Wednesday, August 6, 2025 6:14:25 PM

To: Williams, Craig O/Washington Middle <cowilliams@mcps.com>

Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Craig Williams,

I hope this message finds you well. I am not sure if you remember me, but I worked with you at Williamson High School. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

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<https://outlook.office.com/mail/id/AAkALgAAAAAHYQDEapmEc2byACqAC%2FEWg0ALdynt9fpgUW1BL46sds%2FhQAGj935xwAA>
1/2 9/21/25, 12:45 PM Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook

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Outlook

RE: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

From Knight, Todd/Burns Middle
<tknight@mcpss.com>
Date Thu 8/7/2025 12:12 PM
To Billups, Katrina M/Clark-Shaw Magnet
<kbillups@mcpss.com> **Cc**
BURNS_TEACHERS
<BURNS_TEACHERS@mcpss.com>

I can give you permission for Burns Middle School only, but it will be up to each individual teacher if they want to participate or not.

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Sent: Wednesday, August 6, 2025 6:17 PM
To: Knight, Todd/Burns Middle <tknight@mcpss.com>
Subject: Request for Permission to Survey 6th–12th Grade Teachers for Dissertation Research

Dear Mr. Todd Knight,

I hope this message finds you well. My name is Katrina Billups, and I am a teacher at Clark Shaw Magnet School. I am currently a doctoral candidate at Auburn University. I am writing to request your permission to distribute a brief survey to 6th–12th grade teachers within your district as part of my dissertation research.

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Katrina Billups

Doctoral Candidate, Auburn University

kzb0037@tigermail.auburn.edu | (251)295-0447

<https://outlook.office.com/mail/id/AAkALgAAAAAHYQDEapmEc2byACqAC%2FEWg0ALdynt9fpgUW1BL46sds%2FhQAGkL0ExQAA>
1/29/21/25, 12:47 PM Mail - Billups, Katrina M/Clark-Shaw Magnet - Outlook

Katrina Billups

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Appendix D

IRB Information Letter



INFORMATION LETTER

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

Title of research study: Assessing the Digital Divide in Title 1 and non-Title 1 through infrastructure, support, barriers, and technology use in South Alabama Secondary Schools

Investigator: Katrina Billups

Sponsor: N/A

You are invited to participate in a research study. The purpose of this study is to examine how school demographics such as Title I status, location, type, and school rating relate to differences in technology, access and use in secondary schools. Guided by van Dijk's Digital Divide framework, the study addresses three levels of the digital divide: access to devices and infrastructure, how often and in what ways teachers use technology, and how technology impacts instruction and learning.

The objectives of this study are to identify patterns in access and staff support, explore how frequently teachers integrate digital tools, uncover barriers that limit effective use, and analyze the strategies schools adopt to close gaps in access. By focusing on teachers' perspectives, this research aims to provide a clearer understanding of how technology resources are distributed and used across Title I and non-Title I schools, and how these differences shape equity in student learning opportunities.

The study is being conducted by Katrina Billups, under the direction of Elisha Wohleb, Clinical Professor in the Auburn University Department of *Education*. You were selected as a possible participant because you are a secondary school teacher working in either a Title I or non-Title I school.

If you choose to participate, you will complete an online survey about your experiences with technology in your school, which will take about 15–20 minutes.

Are there any risks or discomforts? The risks of taking part in this study are minimal and are mostly related to possible feelings of discomfort when answering survey questions. To reduce these risks, your responses will remain confidential, and you may skip any question you do not want to answer or stop the survey at any time.

Are there any benefits to yourself or others? You may not receive direct benefits from participating. However, the study may help schools and districts improve technology access and support for teachers and students.

Will you receive compensation for participating? To thank you for your time, you will not receive any payment or compensation.

Are there any costs? If you choose to participate, the only cost is your time to complete the survey. Auburn University does not provide payment if you are harmed as a result of participating in this study.

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

Any data obtained in connection with this study will remain *confidential*. We will protect your privacy and the data you provide by keeping responses secure, removing any identifying information, and reporting results only in group form. Information collected through your participation may be (e.g., used to fulfill an educational requirement, published in a professional journal, and/or presented at a professional meeting, etc.).

If you have questions about this study, please ask them now or contact Katrina Billups at kbillups@mcpss.com / kzb0037@auburn.edu or Elisha Wohleb at wohleec@auburn.edu.

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

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

 9/23/25
Investigator's signature Date

Katrina Billups

Investigator's Name

Co-Investigator's signature

Date

Appendix E

School Technology Needs Assessment (STNA) Survey, Interpretation, and Sample Report



THE WILLIAM & IDA
FRIDAY INSTITUTE
FOR EDUCATIONAL INNOVATION

School Technology Needs Assessment (STNA)

The *School Technology Needs Assessment* (STNA, say “Stenna”) is intended to help school-level decision makers—administrators, technology facilitators, media coordinators, or technology committee members— collect data to plan and improve uses of technology in teaching and learning activities. The STNA is designed to be completed by teachers and other educators working directly with students, and should be administered to the entire staff of any school for which needs are being assessed. STNA results are not scored or reported for each individual respondent. Instead, each person’s responses are combined with those of other educators in their building, and reported at the school level in terms of how many times each possible response is selected for each item. Pilot testing indicates that it should take approximately 25 minutes to complete the STNA.

On this paper-pencil copy of the STNA, responses are coded for use with the *STNA Scoring Tool* spreadsheet. The numbers located next to the response checkboxes have no meaning and are provided only to aid scoring.

Supportive Environment for Technology Use

Selecting Responses – Section I

1. For each item, check the box below the response that best matches how much you agree with the statement - “Strongly Agree,” “Agree,” “Disagree,” or “Strongly Disagree.”
2. If you do not have enough information to form an opinion about the topic of an item, select “Do Not Know.”
3. If you have enough information to form an opinion but are simply split between “Agree” and “Disagree,” select “Neither Agree nor Disagree.”

“In my school...”		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know
		<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
Vision	1) A vision for technology has been developed through an effective collaboration among stakeholders, e.g., administrators, specialists, teachers, students, and community members.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	2) The vision for technology use has been effectively communicated to the community.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	3) Administrators model effective uses of technology.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	4) Administrators support changes in school-level systems, policies, and practices related to technology.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	5) Teachers who are innovators with technology receive nonmaterial incentives, e.g., public recognition, special appreciation.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	6) When administrators are evaluating teachers, they consider technology literacy and leadership for technology.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	7) An effective long-range school technology plan is in place.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
Planning and Budget	8) The school technology plan is developed through an effective collaboration among stakeholders, e.g., administrators, specialists, teachers, students, and community members.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	9) The school technology plan is monitored and updated at least once a year.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	10) Teachers and other staff members support the school technology plan.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	11) The amount of money budgeted for technology resources is sufficient for implementing decisions arising from planning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	12) The amount of money budgeted for technology resources is sufficient for continuously updating and replacing technology systems as they become outdated.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	13) Supplemental sources of funding are actively pursued to support technology, e.g., external grants, collaboration with community or parent groups, support from businesses.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

	14) Multiple sources of data are used to evaluate the impact of technology initiatives on student outcomes.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
Communicator	15) Technology is used to communicate and collaborate with families about school programs and student learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	16) Technology is used to communicate and collaborate with the community about school programs designed to enhance student learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

“In my school...”		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know
Infrastructure and Staff Support	17) There is at least one computer in every classroom	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	18) Teachers have access to enough computers, in the classroom, in a lab, or from a mobile cart, so that they can have one computer for every two students when needed for an activity.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	19) Teachers and students have sufficient access to projectors, printers, digital cameras, printers, and other hardware when I need it.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	20) Electronic systems for communicating within the school are adequate, e.g., e-mail among teachers and staff, network drives to upload lesson plans and grades to the main office.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	21) Electronic systems for communicating with families and the community are adequate, e.g., e-mail, teacher, and/or school Web pages.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	22) Reliability and speed of external connections are sufficient for connecting to the Internet, using online databases, viewing online video, and accessing other resources.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	23) Students can access appropriate web resources and tools that teachers would like them to use without being blocked by filters.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	24) Teachers have ready access to technical support, e.g., to troubleshoot hardware or software problems, maintain systems.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	25) Library media coordinator and/or media assistant positions are adequately staffed.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

26) Technology facilitator and/or technology assistant positions are adequately staffed.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
27) Teachers and students have ready access to productivity software, e.g., graphic organizer, word processing, slide presentation, or drawing applications.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
28) Teachers have ready access to a cataloging system they can use for searching and locating teaching materials.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
29) Teachers and students have ready access to a good collection of print, multimedia, and electronic resources.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
30) When educators are selecting resource media and software, they consider both the curriculum and the needs of learners.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
31) The media center can be flexibly scheduled to provide equitable access to resources and instruction.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
32) Computer labs can be flexibly scheduled for equitable access to resources and instruction. (Leave this item blank if your school has no computer labs.)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
33) Mobile computers can be flexibly scheduled to provide equitable access to resources and instruction. (Leave this item blank if your school has no mobile computers.)	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

Professional Development

Selecting Responses – Section II

1. For each item, check the box below the response that best matches how much you agree with the statement - “Strongly Agree,” “Agree,” “Disagree,” or “Strongly Disagree.”
2. If you do not have enough information to form an opinion about the topic of an item, select “Do Not Know.”
3. If you have enough information to form an opinion but are simply split between “Agree” and “Disagree,” select “Neither Agree nor Disagree.”

		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know
“I would benefit from professional development on...”							
Professional Development Needs	1) Research-based practices I can use in my teaching.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	2) Identification, location, and evaluation of technology resources, e.g., websites that I can use with my students.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	3) Performance-based student assessment of my students.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	4) The use of technology to collect and analyze student assessment data.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	5) Learner-centered teaching strategies that incorporate technology, e.g., project-based or cooperative learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	6) Online security and safety.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	7) The use of technology for differentiating instruction for students with special learning needs.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	8) Uses of technology to increase my professional productivity.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	9) Ways to use technology to communicate and collaborate with families about school programs and student learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	10) Ways to use technology to communicate and collaborate with other educators.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

11) Alignment of lesson plans to content standards and student technology standards.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
12) Use of research or action research projects to improve technology-enhanced classroom practices.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
13) Use of data for reflecting on my professional practices.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
14) Use of data to make decisions about the use of technology.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
15) Use of technology to participate in professional development activities, e.g. online workshops, hands-on training in a computer lab.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

“In my school...”		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know
Professional Development Quality	16) Educators in charge of professional development use data from teachers' needs assessments to determine technology professional development topics and activities.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	17) Technology professional development is timely.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	18) Technology professional development is relevant.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	19) Technology professional development is ongoing.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	20) Teachers have an opportunity to evaluate technology professional development activities in which they participate.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	21) The impact of technology professional development is tracked using data on classroom practice .	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	22) The impact of technology professional development is tracked using data on student learning .	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

Teaching and Learning

Selecting Responses – Section III

1. For each item, check the box below the response that comes closest to indicating how often you do the described activity - “Daily,” “Weekly,” and so on.
2. If you do not have enough information to select a number response for an item, select “Do Not Know.”

		Daily	Weekly	Monthly	Once per Grading Period	Never	Do Not Know
“In the settings where I work with children...”							
Teacher Technology Use	1) I consult publications, online journals, or other resources to identify research-based practices I can use in teaching with technology.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	2) I identify, locate, and evaluate technology resources for use by my students, e.g., websites.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	3) I apply performance-based student assessment to technology-enhanced lessons, e.g., student portfolios, student presentations.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	4) I use technology regularly to collect and analyze student assessment data.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	5) My lessons include technology-enhanced, learner-centered teaching strategies, e.g., project-based learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	6) I apply policies and practices to enhance online security and safety.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	7) I use technology to differentiate instruction for students with special learning needs.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	8) I use technology to support and increase my professional productivity.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	9) I use technology to communicate and collaborate with families about school programs and student learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	10) I use technology to communicate and collaborate with other educators.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

11) My lesson plans refer to both content standards and student technology standards.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
12) I do research or action research projects to improve technology-enhanced classroom practices.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
13) I use multiple sources of data for reflecting on professional practice.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
14) I use multiple sources of data to make decisions about the use of technology.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
15) I use technology to participate in professional development activities, e.g. online workshops, hands-on training in a computer lab.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

		Daily	Weekly	Monthly	Once per Grading Period	Never	Do Not Know
“In the settings where I work with children...”							
Student Technology Use	16) Students use a variety of technologies, e.g., productivity, visualization, research, and communication tools.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	17) Students use technology during the school day to communicate and collaborate with others, beyond the classroom.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	18) Students use technology to access online resources and information as a part of classroom activities.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	19) Students use the same kinds of tools that professional researchers use, e.g., simulations, databases, satellite imagery.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	20) Students work on technology-enhanced projects that approach real-world applications of technology.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	21) Students use technology to help solve problems.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	22) Students use technology to support higher-order thinking, e.g., analysis, synthesis, and evaluation of ideas and information.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	23) Students use technology to create new ideas and representations of information.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

Impact of Technology

Selecting Responses – Section IV

1. For each item, check the box below the response that best matches how much you agree with the statement - “Strongly Agree,” “Agree,” “Disagree,” or “Strongly Disagree.”
2. If you do not have enough information to form an opinion about the topic of an item, select “Do Not Know.”
3. If you have enough information to form an opinion but are simply split between “Agree” and “Disagree,” select “Neither Agree nor Disagree.”

		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know
“In the settings where I work with children...”							
Teacher Impact	1) My teaching is more student-centered and interactive when technology is integrated into instruction.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	2) My teaching practices emphasize teacher uses of technology skills to support instruction.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	3) My teaching practices emphasize student uses of productivity applications, e.g., word processing, spreadsheet.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	4) My teaching practices emphasize student uses of technology as an integral part of specific teaching strategies, e.g., project-based or cooperative learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
Student Impact	5) Technology has helped my students become more socially aware, confident, and positive about their future.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	6) Technology has helped my students become independent learners and self-starters.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	7) Technology has helped my students work more collaboratively.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	8) Technology has increased my students’ engagement in their learning.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
	9) Technology has helped my students achieve greater academic success.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

The School Technology Needs Assessment Interpretation Guide

The School Technology Needs Assessment (STNA, pronounced "stenna") was originally developed by

SEIR*TEC at SERVE in collaboration with the North Carolina Department of Public Instruction's Educational Technology Division, as part of the LANCET project (Looking at North Carolina Educational Technology).

What the STNA Measures

The STNA (teacher version) and STNA-S (student version) are intended to determine the collective needs of a school, from the teachers' and students' perspectives, related to the use of technology in education settings. The current version of the STNA is expected to uncover teacher and student perceptions of four constructs and ten sub-constructs, listed in the table below.

I. Supportive Environment for Technology Use: <i>a. Vision</i> <i>b. Planning and Budget</i> <i>c. Communication</i> <i>d. Infrastructure and Staff Support</i>	II. Professional Development: <i>a. Professional Development Needs</i> <i>b. Quality of Professional Development</i>
III. Teaching and Learning: <i>a. Purpose of Technology Use</i> <i>b. Frequency of Technology Use</i>	IV. Impact of Technology: <i>a. Impact on Teaching Practices</i> <i>b. Impact on Student Outcomes</i>

How to Use STNA Data

The STNA and STNA-S provide information to help planners—administrators, technology and media specialists, and school or technology planning team members—make

purchasing, resource allocation, or other decisions relating to technology. They also provide decision makers and policy makers with data to guide building- and district-level decisions about resource allocation, professional development, and school readiness for technology initiatives.

Collecting Data

The STNA collects perception data (what teachers or students think or feel) about a variety of broad areas of technology implementation in your school. Survey data provides information from one angle so it may be helpful to employ other methods of data collection to compare results and to gain better insight into why participants think or feel about a certain topic. Consider collecting additional information to see if responses point to a common conclusion. Interviews or observations, for example, are other angles from which you can better understand how technology implementation impacts teachers and students in your school or district.

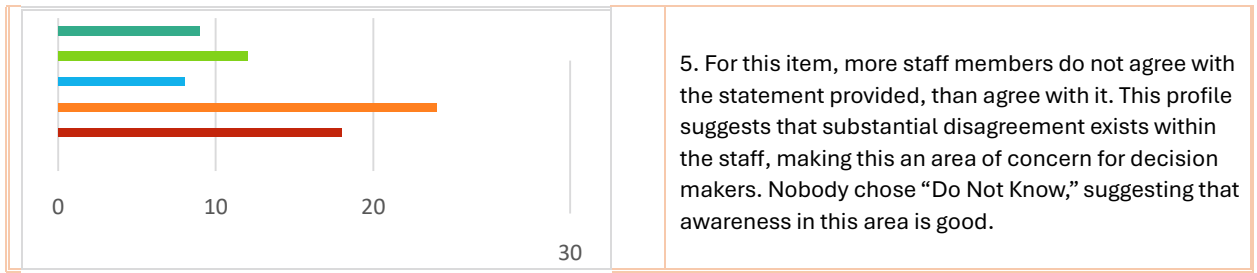
How to Interpret Your STNA Report

Data for the STNA were collected through an online surveying system by the Friday Institute for Educational Innovation at North Carolina State University in Raleigh, NC. Responses were analyzed through the online system and results in the following sections provide a picture of your school as a whole, presented as frequencies and percentages of responses to all items, and as bar chart representations of those values.

To simplify the interpretation of the STNA, all items are designed as positive statements. Each construct examined by the STNA is thought to be beneficial for successful implementation of technology in teaching and learning settings. This means that it is generally good if a large number of staff members report that they “Strongly Agree” with a STNA item statement, or that they do something “Very Often” with technology in their classrooms. However, even schools with high levels of technology integration should expect to have items for which the most positive response options are not highly endorsed.

STNA Report Profile Examples

	<p>The following profiles illustrate potential STNA data distributions and suggestions for how to interpret such data for additional information gathering or planning purposes. It is important to identify bar charts that “stand out” from others and to think critically about the results for each item.</p>
	<p>1. All responses either “Strongly Agree” or “Agree” with the statement. Since all STNA items are worded positively, it is reasonable to infer that needs are being met in the area examined by the item. However, if you expected a much more enthusiastic response (e.g., mostly strongly agree), there might be room for improvement but may not be an immediate priority.</p>
	<p>2. In this example, respondents as a group are feeling neutral to negative about the area examined by the item resulting in this profile. This response distribution represents an issue that should be an area of concern for building decision makers, assuming that the substance of the item is a priority.</p>
	<p>3. In this profile, a large number of respondents report that they “Do Not Know” – that they do not have enough information to respond to the statement in the item. This may suggest that a large portion of the staff is not fully informed about its substance. It may be that they did not recognize a key term in the item, or that in their position they do not have access to some information necessary to respond. Gathering additional information may prove useful to learn more.</p>
	<p>4. This profile more closely resembles the normal or bell-shaped curve, indicating a staff that is mixed in the nature of members’ thinking about the area examined by the item. While it may be that the staff as a whole does not have strong feelings about the substance of the item, it would be useful to investigate further why people feel the way they do, including why a number chose “Neither Agree nor Disagree.”</p>



5. For this item, more staff members do not agree with the statement provided, than agree with it. This profile suggests that substantial disagreement exists within the staff, making this an area of concern for decision makers. Nobody chose “Do Not Know,” suggesting that awareness in this area is good.

Note: Table adapted from the SERVE Center at UNC Greensboro STNA interpretation guide (<http://www.serve.org/uploads/docs/STNA3inferences.pdf>)



School Technology Needs Assessment for Teachers (STNA)

Sample Report for

ABC HIGH SCHOOL

Prepared for NCTIES Conference on March 6, 2013 by



THE WILLIAM & IDA
FRIDAY INSTITUTE
FOR EDUCATIONAL INNOVATION

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The School Technology Needs Assessment

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The STNA and STNA-S are intended to determine the collective needs of a school, from the teachers' and students' perspectives, related to the use of technology in education settings. The STNA and STNA-S provide information to help planners—administrators, technology and media specialists, and school or technology planning team members— make purchasing, resource allocation, or other decisions relating to technology. They also provide decision makers and policy makers with data to guide building- and district-level decisions about resource allocation, professional development, and school readiness for technology initiatives.

The current version of the STNA (4.0) is expected to uncover teacher perceptions of four constructs and ten subconstructs, listed below.

- Supportive Environment for Technology Use - This construct subsumes four subconstructs, which are Vision; Planning and Budget; Communication; and Infrastructure and Staff Support.

- Professional Development - The two Professional Development subconstructs ask teachers about their professional development needs as well as the quality of the professional development they receive.

- Teaching and Learning - The two subconstructs captured by Teaching and Learning ask teachers the purpose and frequency with which teachers and students use technology.

- Impact of Technology - This construct consists of two subconstructs, one that addresses the overall impact on teaching practices, and another that addresses student outcomes.

If you have any questions, please contact Jennifer Maxfield at jennifer_maxfield@ncsu.edu or 919-513-8556.

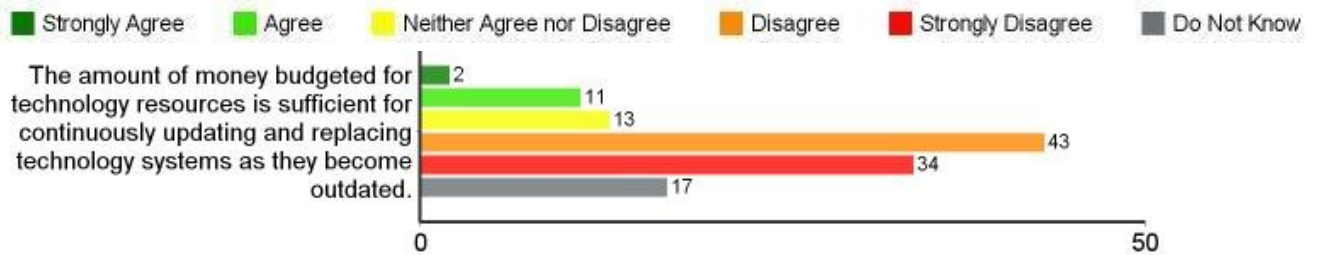
How to Interpret this Report

Data for the STNA were collected through an online surveying system by the Friday Institute for Educational Innovation at North Carolina State University in Raleigh, NC. Responses were analyzed through the online system and results in the following sections provide a picture of your school as a whole, presented as frequencies and percentages of responses to all items, and as bar chart representations of those values.

The STNA collects *perception data* (what teachers think or feel) about a variety of broad areas of technology implementation in your school. Interpretation is simplified by the design of the STNA, in which all items are stated such that one end of the scale is inherently positive (green bars). Each construct examined by the STNA is thought to be beneficial for successful implementation of technology in teaching and learning settings. This means that it is generally good if a large number of staff members report that they “Strongly Agree” with a STNA item statement, or that they do something “Very Often” with technology in their classrooms. However, even schools with high levels of technology integration should expect to have items for which the most positive response options are not highly endorsed. The numbers at the end of each bar indicate the number of respondents who endorsed the response option represented by that particular bar; the percentage of respondents who endorsed each response option is provided in the tables below the graphs.

Examples

In the first profile, the majority of respondents either “Strongly Disagree” or “Disagree” with the statement in the item. Since all STNA items are worded positively, it is reasonable to infer that needs are not being met in the area examined by the item.

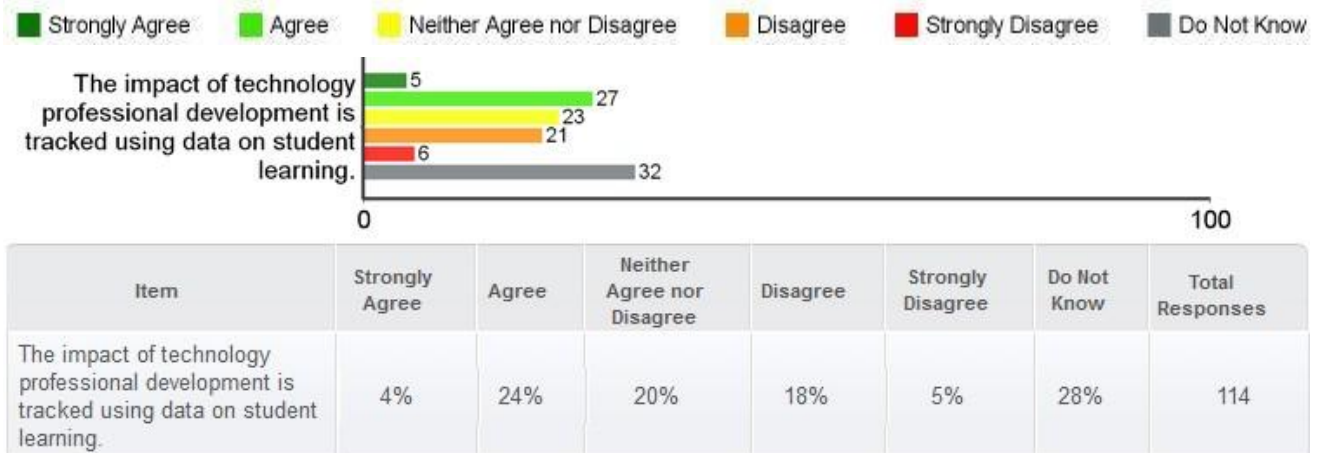


Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
The amount of money budgeted for technology resources is sufficient for continuously updating and replacing technology systems as they become outdated.	2%	9%	11%	36%	28%	14%	120

This second profile represents a group of respondents that is very mixed in its thinking about the area examined. Additional information will be required to determine why teachers feel the way that they do about issues related to this item. It is difficult to make any specific inferences, but it is possible that a need is not being met and that this is an area that should be explored further.



The third profile below shows that a large number of respondents report that they “Do Not Know,” which indicates that they do not have enough information to respond to the statement. This suggests that a large portion of the staff is not fully informed about this area, or that they do not have access to some information necessary to respond. In this case, it is possible a need is not being met and gathering additional information about why the respondents are uninformed might prove helpful.



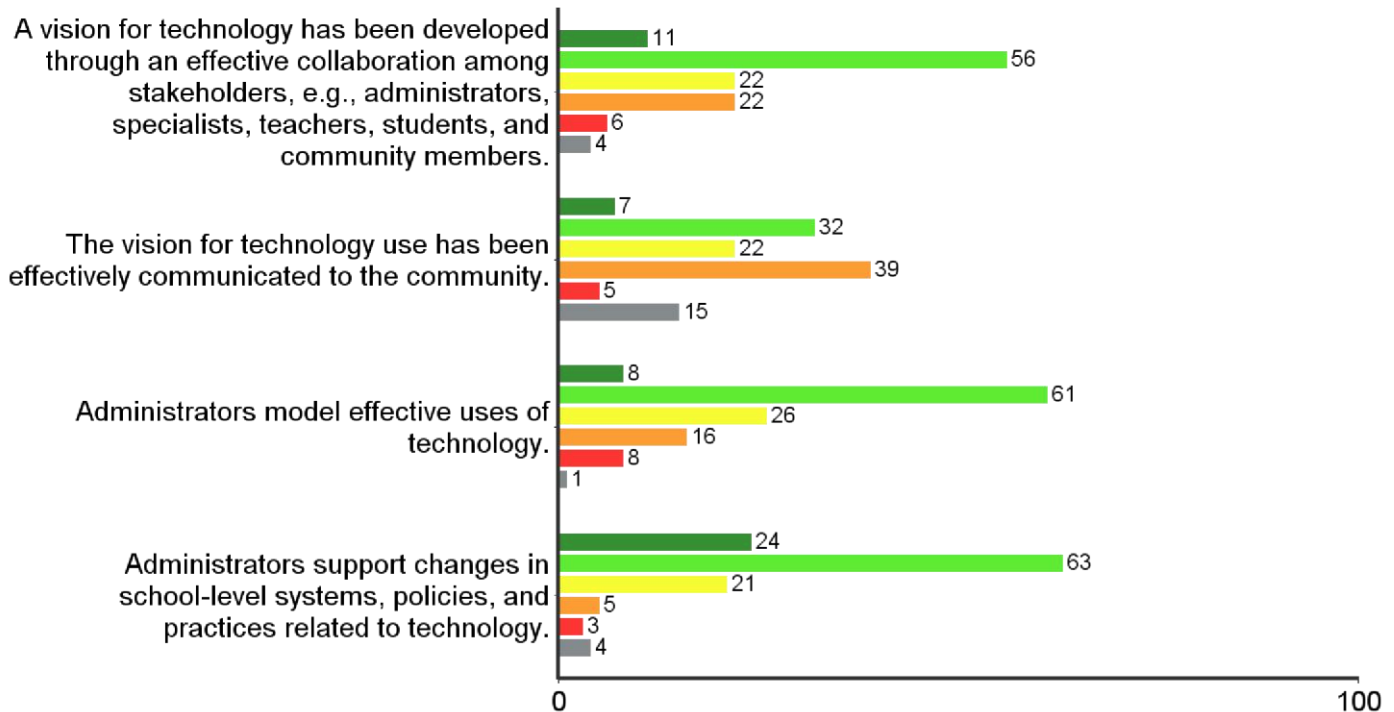
The remaining pages contain the actual STNA report for your school. Use your knowledge of the STNA to make data-driven decisions about what steps to take next and to determine how to address your school's needs to better support technology use in teaching and learning.

SUPPORTIVE ENVIRONMENT FOR TECHNOLOGY USE

The following statements pertain to VISION.

"In my school..."

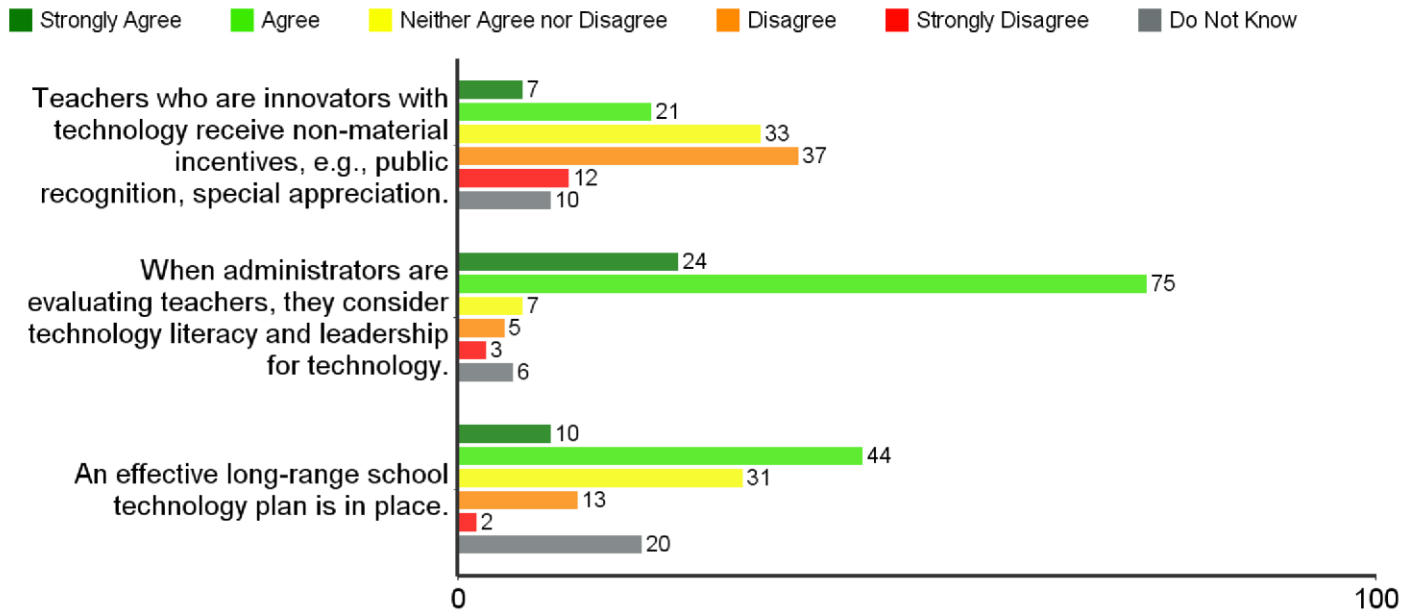
■ Strongly Agree
 ■ Agree
 ■ Neither Agree nor Disagree
 ■ Disagree
 ■ Strongly Disagree
 ■ Do Not Know



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
A vision for technology has been developed through an effective collaboration among stakeholders, e.g., administrators, specialists, teachers, students, and community members.	9%	46%	18%	18%	5%	3%	121
The vision for technology use has been effectively communicated to the community.	6%	27%	18%	33%	4%	13%	120
Administrators model effective uses of technology.	7%	51%	22%	13%	7%	1%	120
Administrators support changes in school-level systems, policies, and practices related to technology.	20%	53%	18%	4%	3%	3%	120

The following statements pertain to VISION (continued).

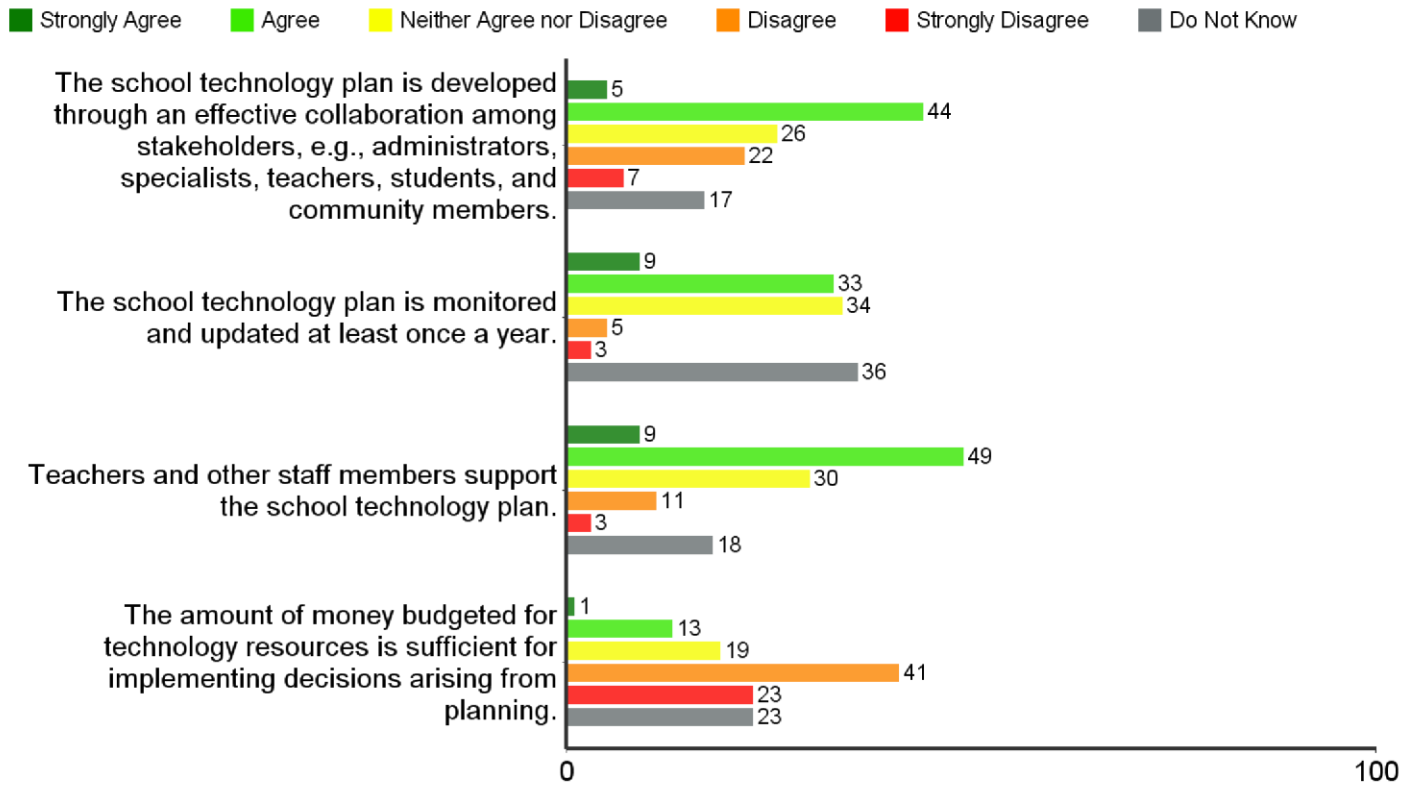
"In my school..."



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
Teachers who are innovators with technology receive non-material incentives, e.g., public recognition, special appreciation.	6%	18%	28%	31%	10%	8%	120
When administrators are evaluating teachers, they consider technology literacy and leadership for technology.	20%	63%	6%	4%	3%	5%	120
An effective long-range school technology plan is in place.	8%	37%	26%	11%	2%	17%	120

The following statements pertain to PLANNING AND BUDGET.

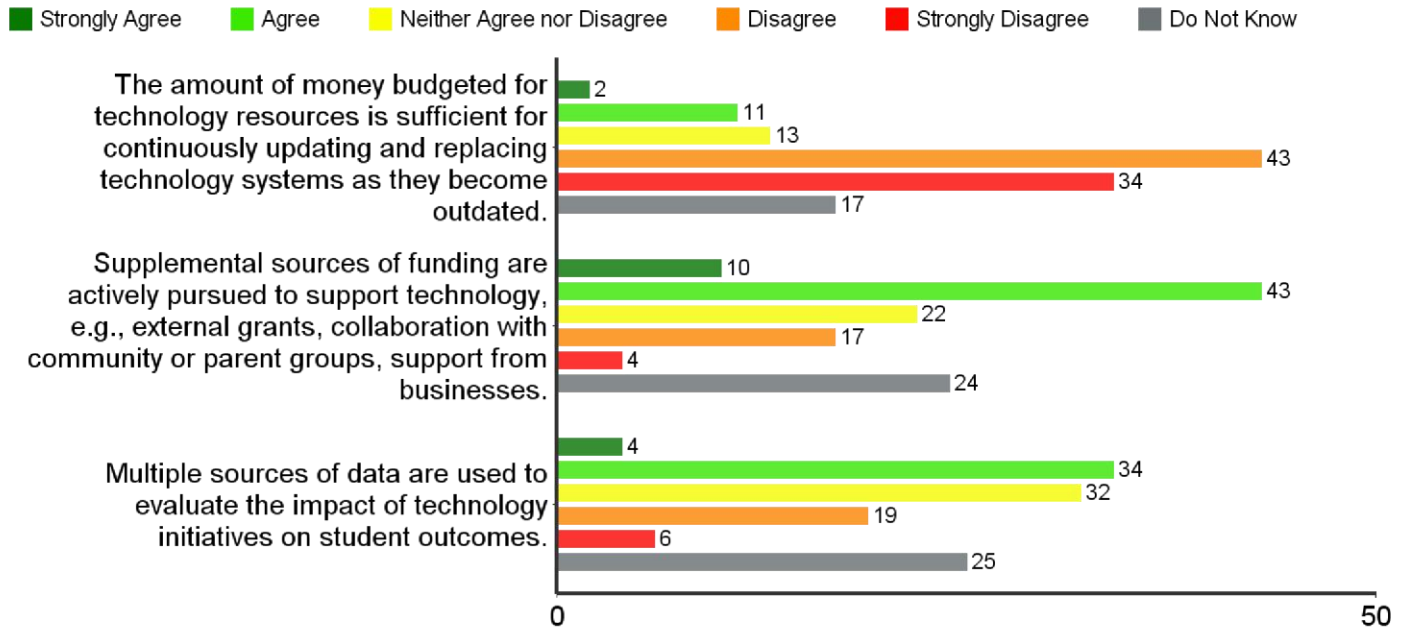
"In my school..."



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
The school technology plan is developed through an effective collaboration among stakeholders, e.g., administrators, specialists, teachers, students, and community members.	4%	36%	21%	18%	6%	14%	121
The school technology plan is monitored and updated at least once a year.	8%	28%	28%	4%	3%	30%	120
Teachers and other staff members support the school technology plan.	8%	41%	25%	9%	3%	15%	120
The amount of money budgeted for technology resources is sufficient for implementing decisions arising from planning.	1%	11%	16%	34%	19%	19%	120

The following statements pertain to **PLANNING AND BUDGET** (continued).

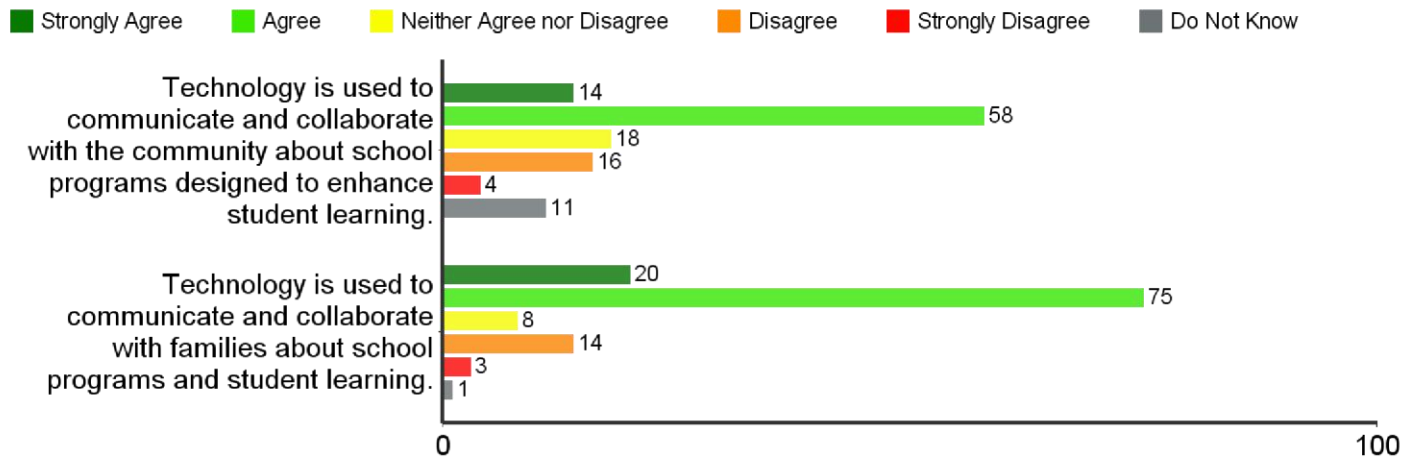
"In my school..."



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
The amount of money budgeted for technology resources is sufficient for continuously updating and replacing technology systems as they become outdated.	2%	9%	11%	36%	28%	14%	120
Supplemental sources of funding are actively pursued to support technology, e.g., external grants, collaboration with community or parent groups, support from businesses.	8%	36%	18%	14%	3%	20%	120
Multiple sources of data are used to evaluate the impact of technology initiatives on student outcomes.	3%	28%	27%	16%	5%	21%	120

The following statements pertain to **COMMUNICATION**.

"In my school..."

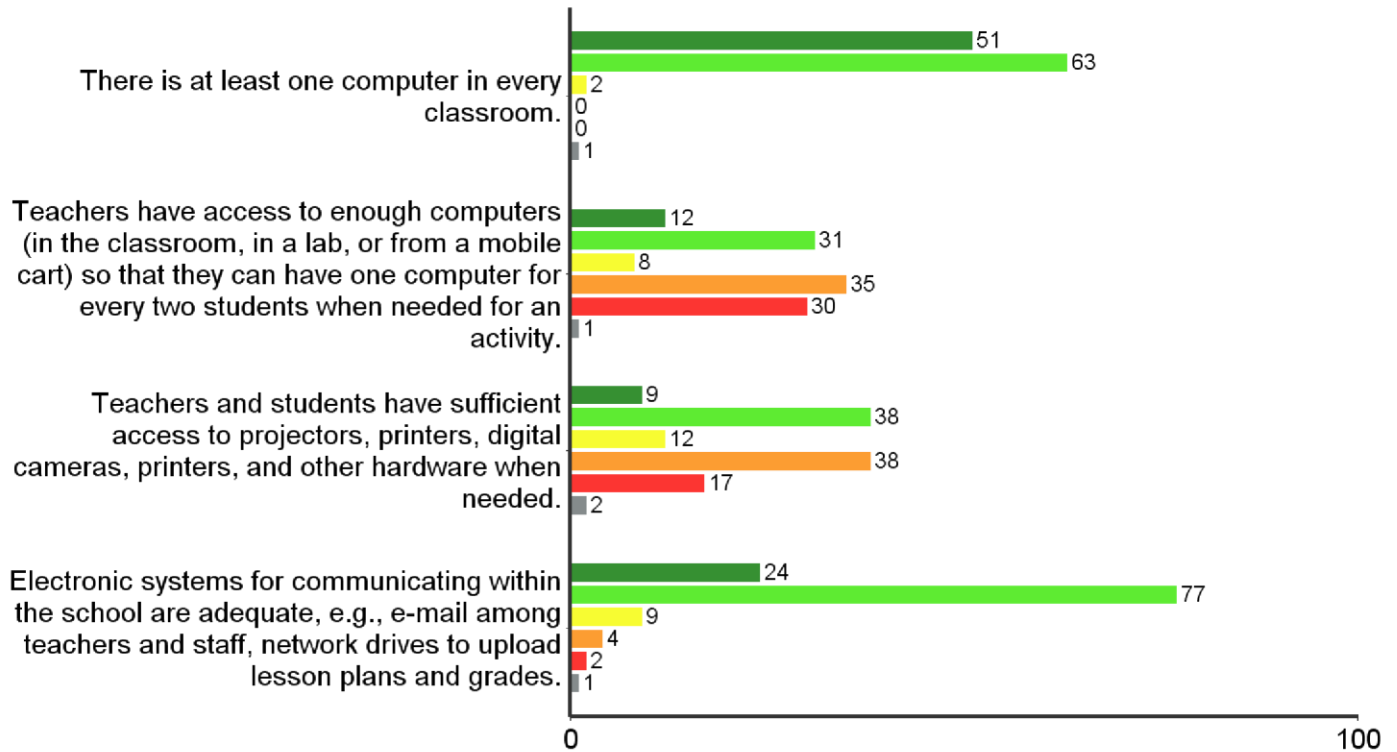


Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
Technology is used to communicate and collaborate with the community about school programs designed to enhance student learning.	12%	48%	15%	13%	3%	9%	121
Technology is used to communicate and collaborate with families about school programs and student learning.	17%	62%	7%	12%	2%	1%	121

The following statements pertain to **INFRASTRUCTURE AND STAFF SUPPORT**.

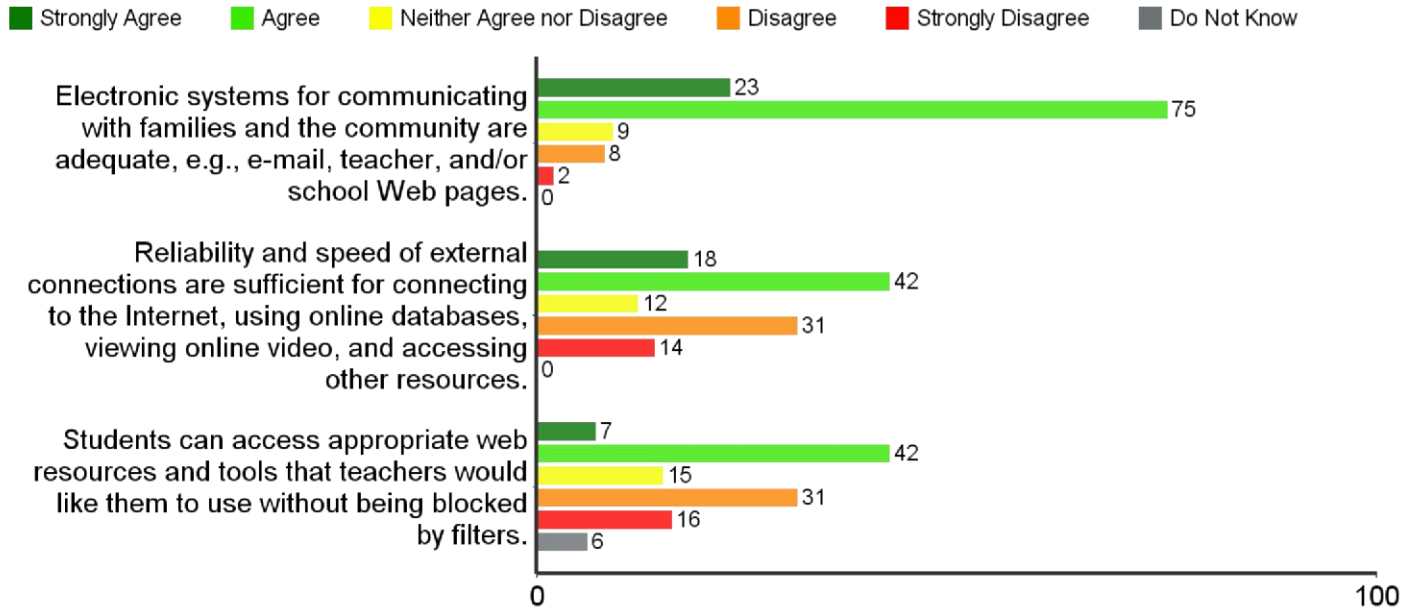
"In my school..."

■ Strongly Agree
 ■ Agree
 ■ Neither Agree nor Disagree
 ■ Disagree
 ■ Strongly Disagree
 ■ Do Not Know



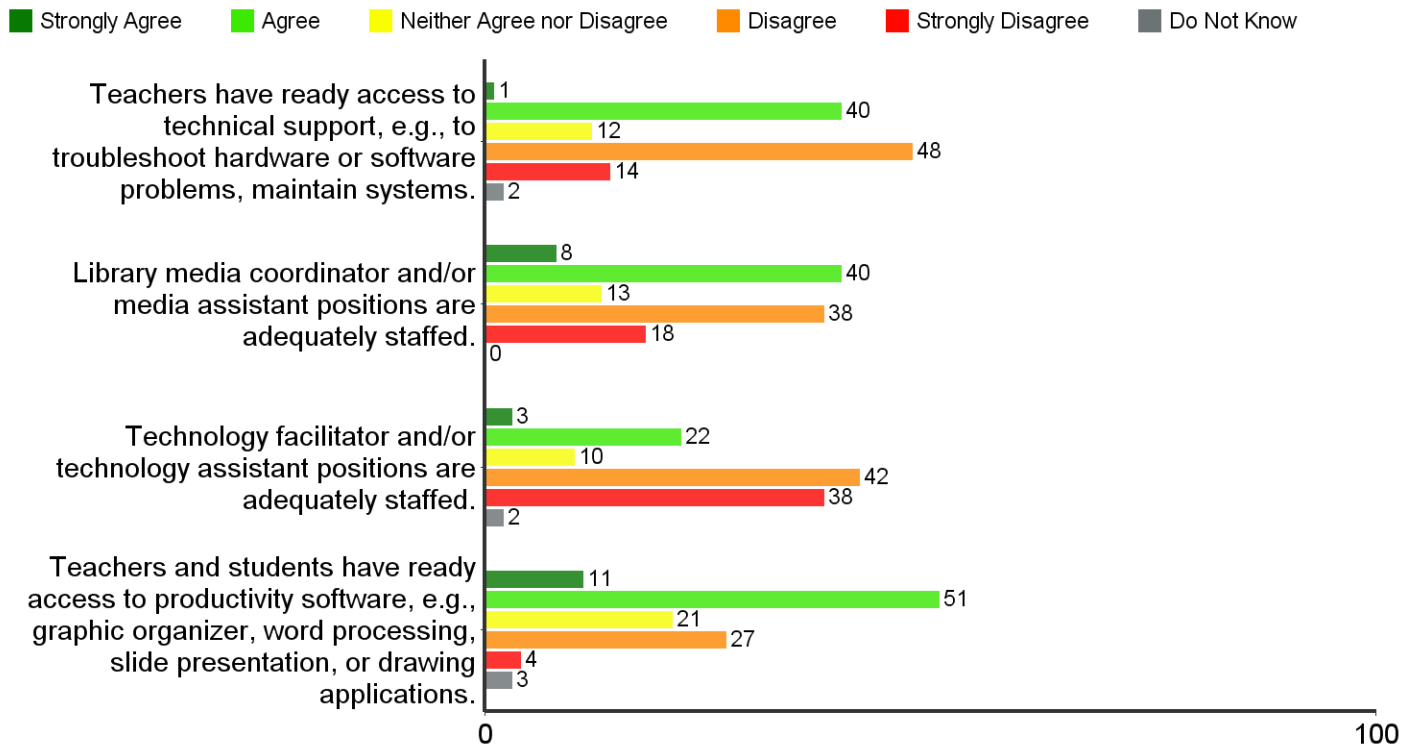
Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
There is at least one computer in every classroom.	44%	54%	2%	-	-	1%	117
Teachers have access to enough computers (in the classroom, in a lab, or from a mobile cart) so that they can have one computer for every two students when needed for an activity.	10%	26%	7%	30%	26%	1%	117
Teachers and students have sufficient access to projectors, printers, digital cameras, printers, and other hardware when needed.	8%	33%	10%	33%	15%	2%	116
Electronic systems for communicating within the school are adequate, e.g., e-mail among teachers and staff, network drives to upload lesson plans and grades.	21%	66%	8%	3%	2%	1%	117

"In my school..."



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
Electronic systems for communicating with families and the community are adequate, e.g., e-mail, teacher, and/or school Web pages.	20%	64%	8%	7%	2%	-	117
Reliability and speed of external connections are sufficient for connecting to the Internet, using online databases, viewing online video, and accessing other resources.	15%	36%	10%	26%	12%	-	117
Students can access appropriate web resources and tools that teachers would like them to use without being blocked by filters.	6%	36%	13%	26%	14%	5%	117

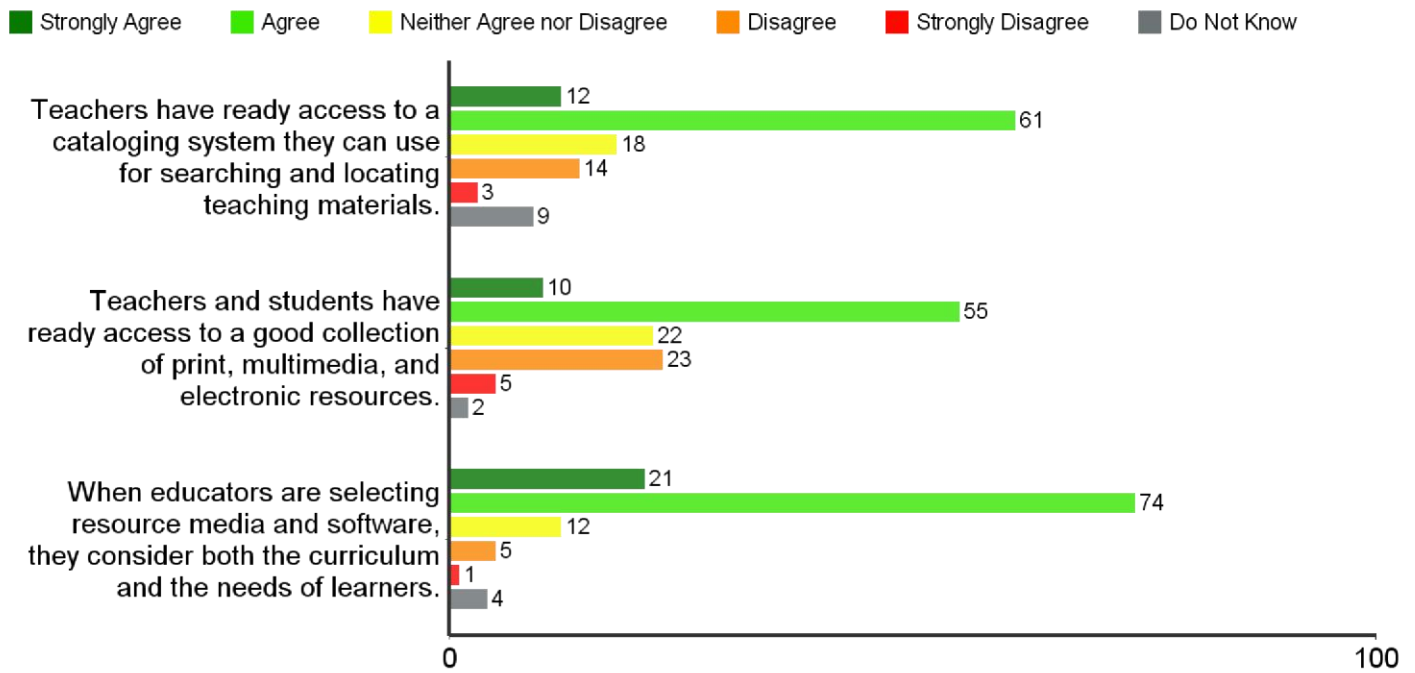
"In my school..."



"In my school..."

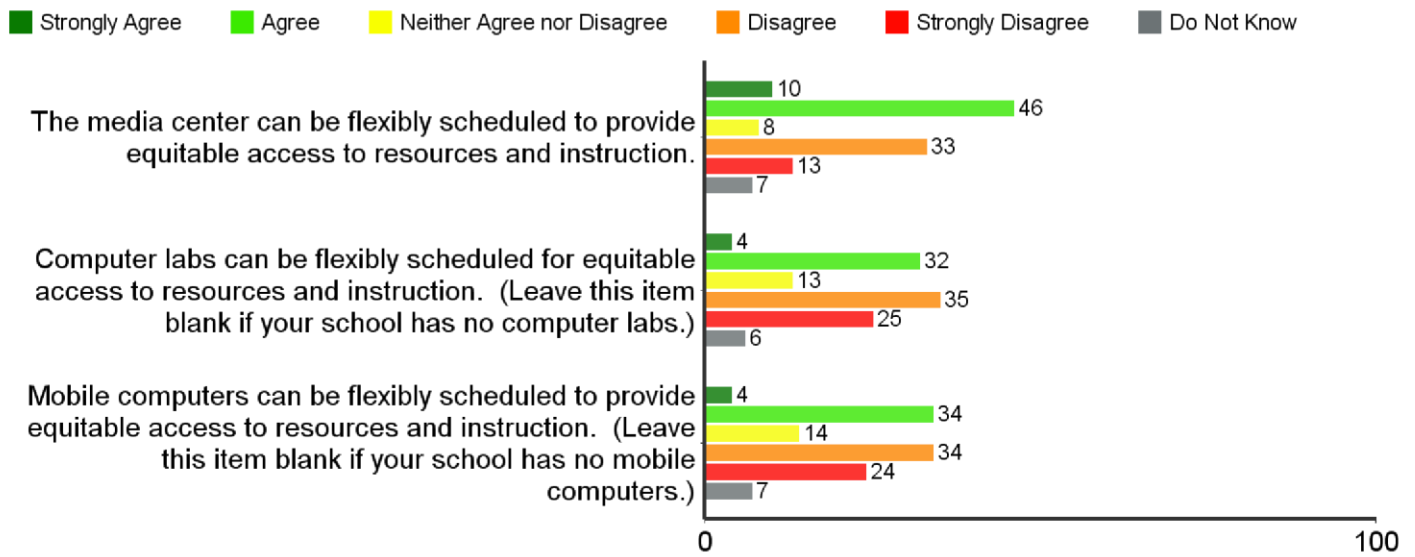
Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
Teachers have ready access to technical support, e.g., to troubleshoot hardware or software problems, maintain systems.	1%	34%	10%	41%	12%	2%	117
Library media coordinator and/or media assistant positions are adequately staffed.	7%	34%	11%	32%	15%	-	117
Technology facilitator and/or technology assistant positions are adequately staffed.	3%	19%	9%	36%	32%	2%	117
Teachers and students have ready access to productivity software, e.g., graphic organizer, word processing, slide presentation, or drawing applications.	9%	44%	18%	23%	3%	3%	117

"In my school..."



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
Teachers have ready access to a cataloging system they can use for searching and locating teaching materials.	10%	52%	15%	12%	3%	8%	117
Teachers and students have ready access to a good collection of print, multimedia, and electronic resources.	9%	47%	19%	20%	4%	2%	117
When educators are selecting resource media and software, they consider both the curriculum and the needs of learners.	18%	63%	10%	4%	1%	3%	117

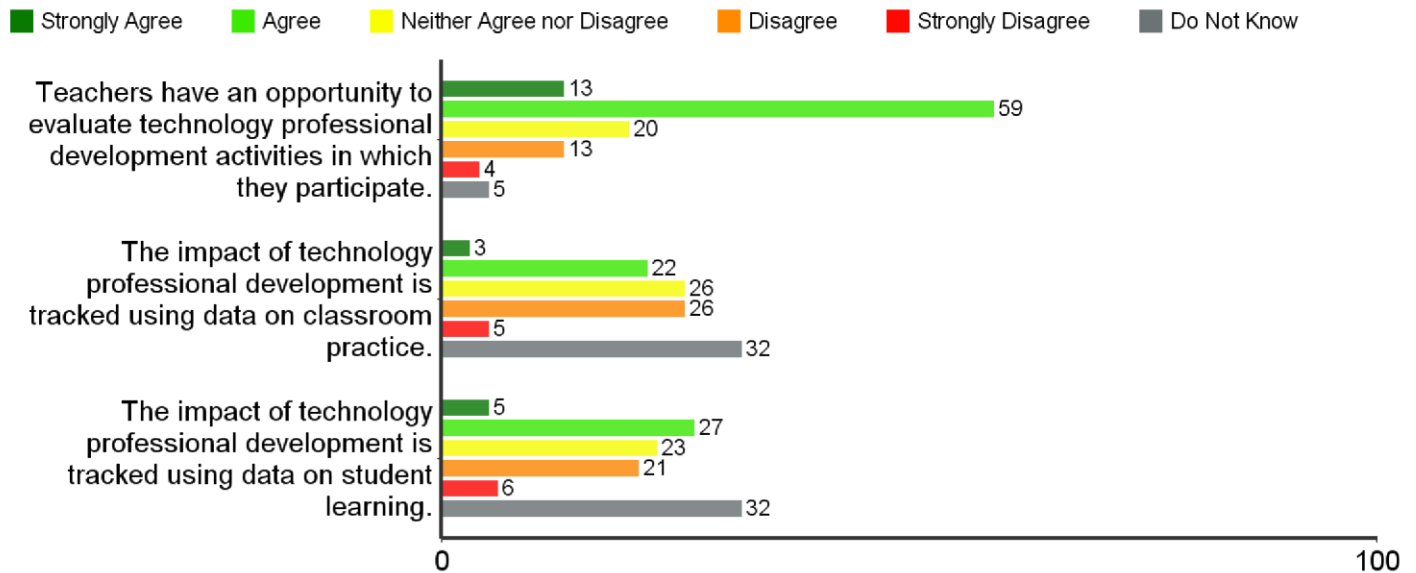
"In my school..."



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
The media center can be flexibly scheduled to provide equitable access to resources and instruction.	9%	39%	7%	28%	11%	6%	117
Computer labs can be flexibly scheduled for equitable access to resources and instruction. (Leave this item blank if your school has no computer labs.)	3%	28%	11%	30%	22%	5%	115
Mobile computers can be flexibly scheduled to provide equitable access to resources and instruction. (Leave this item blank if your school has no mobile computers.)	3%	29%	12%	29%	21%	6%	117

The following statements pertain to **PROFESSIONAL DEVELOPMENT QUALITY** (continued).

"In my school.."

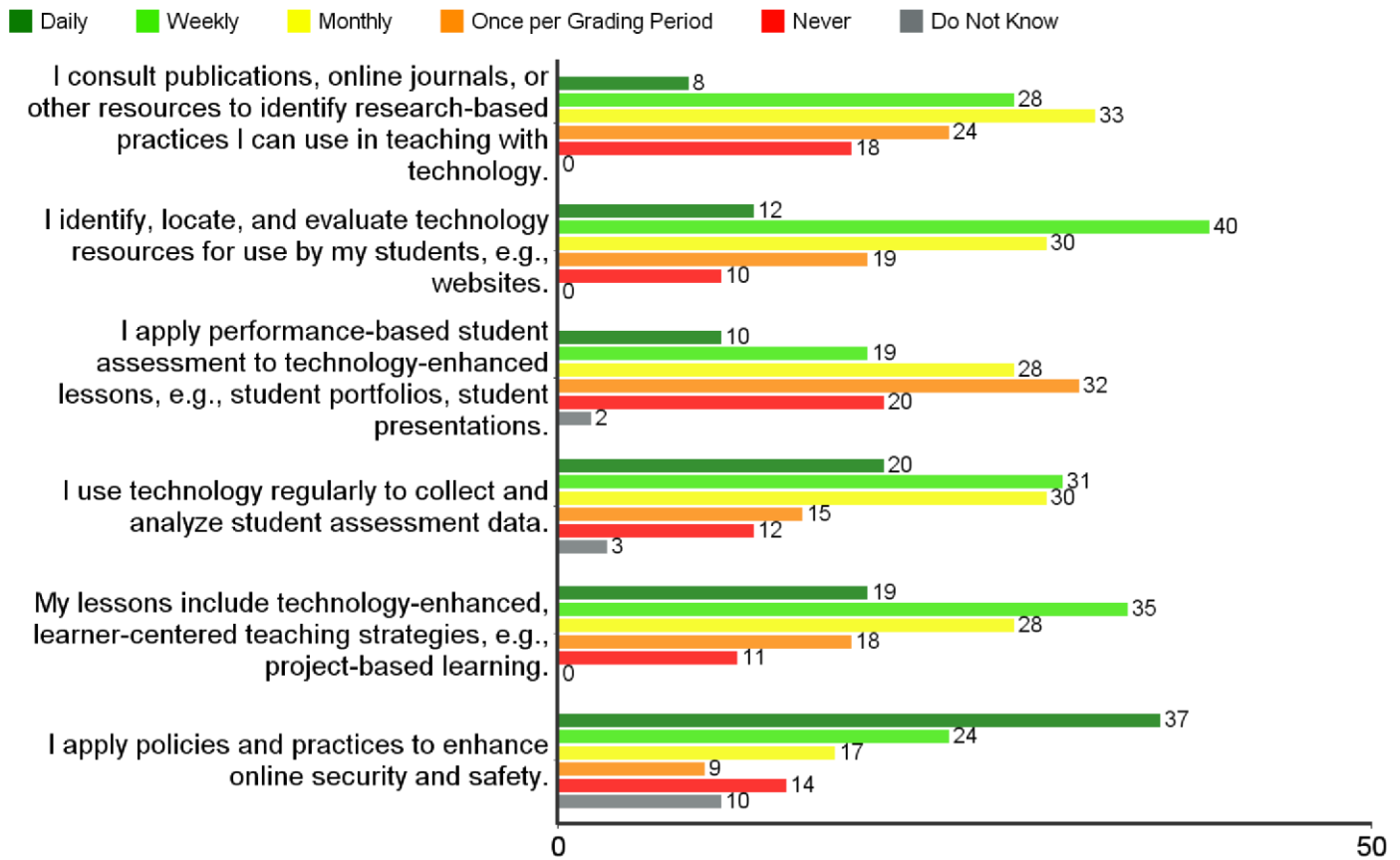


Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
Teachers have an opportunity to evaluate technology professional development activities in which they participate.	11%	52%	18%	11%	4%	4%	114
The impact of technology professional development is tracked using data on classroom practice.	3%	19%	23%	23%	4%	28%	114
The impact of technology professional development is tracked using data on student learning.	4%	24%	20%	18%	5%	28%	114

TEACHING AND LEARNING

The following statements pertain to **TEACHER TECHNOLOGY USE**.

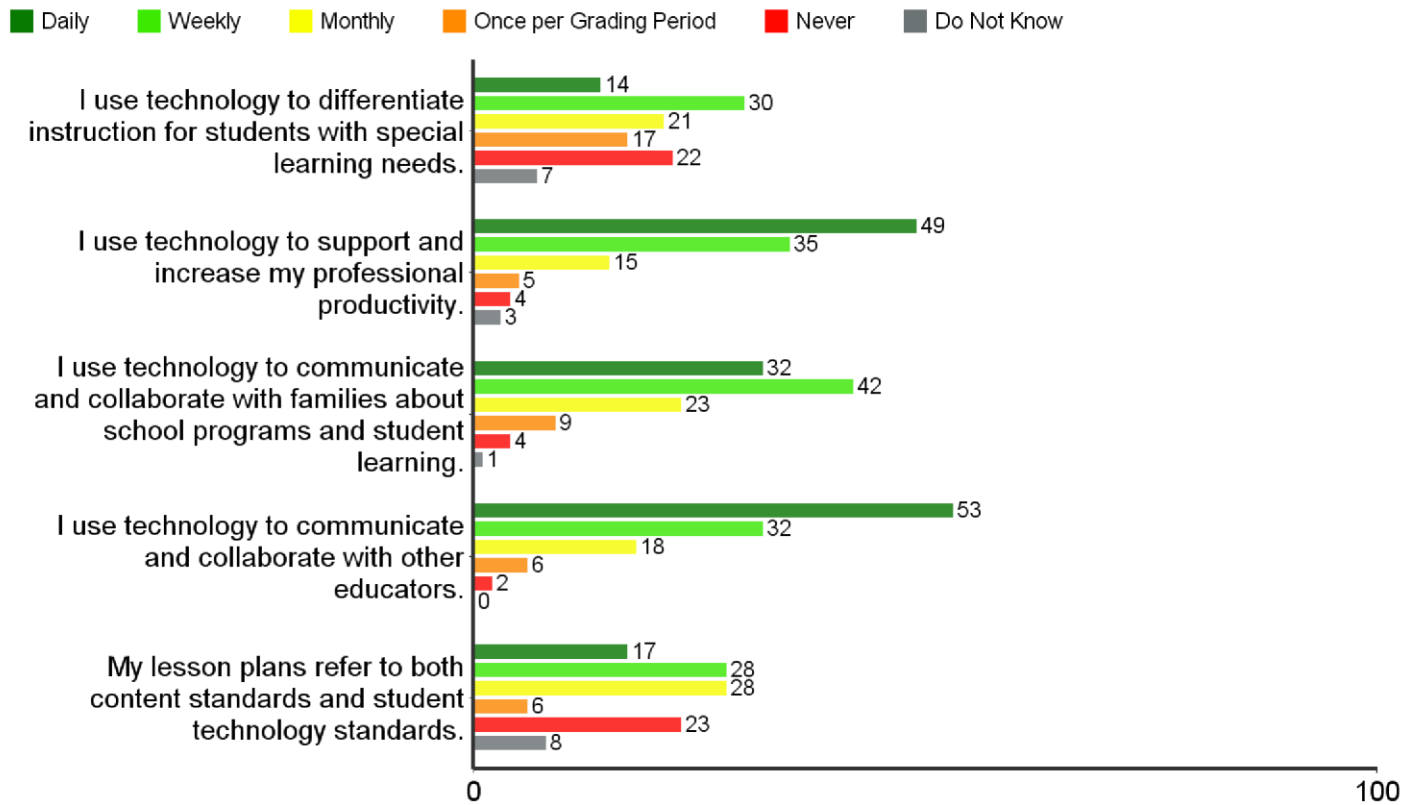
“In the settings where I work with children...”



Item	Daily	Weekly	Monthly	Once per Grading Period	Never	Do Not Know	Total Responses
I consult publications, online journals, or other resources to identify research-based practices I can use in teaching with technology.	7%	25%	30%	22%	16%	-	111
I identify, locate, and evaluate technology resources for use by my students, e.g., websites.	11%	36%	27%	17%	9%	-	111
I apply performance-based student assessment to technology-enhanced lessons, e.g., student portfolios, student presentations.	9%	17%	25%	29%	18%	2%	111
I use technology regularly to collect and analyze student assessment data.	18%	28%	27%	14%	11%	3%	111
My lessons include technology-enhanced, learner-centered teaching strategies, e.g., project-based learning.	17%	32%	25%	16%	10%	-	111
I apply policies and practices to enhance online security and safety.	33%	22%	15%	8%	13%	9%	111

The following statements pertain to **TEACHER TECHNOLOGY USE** (continued).

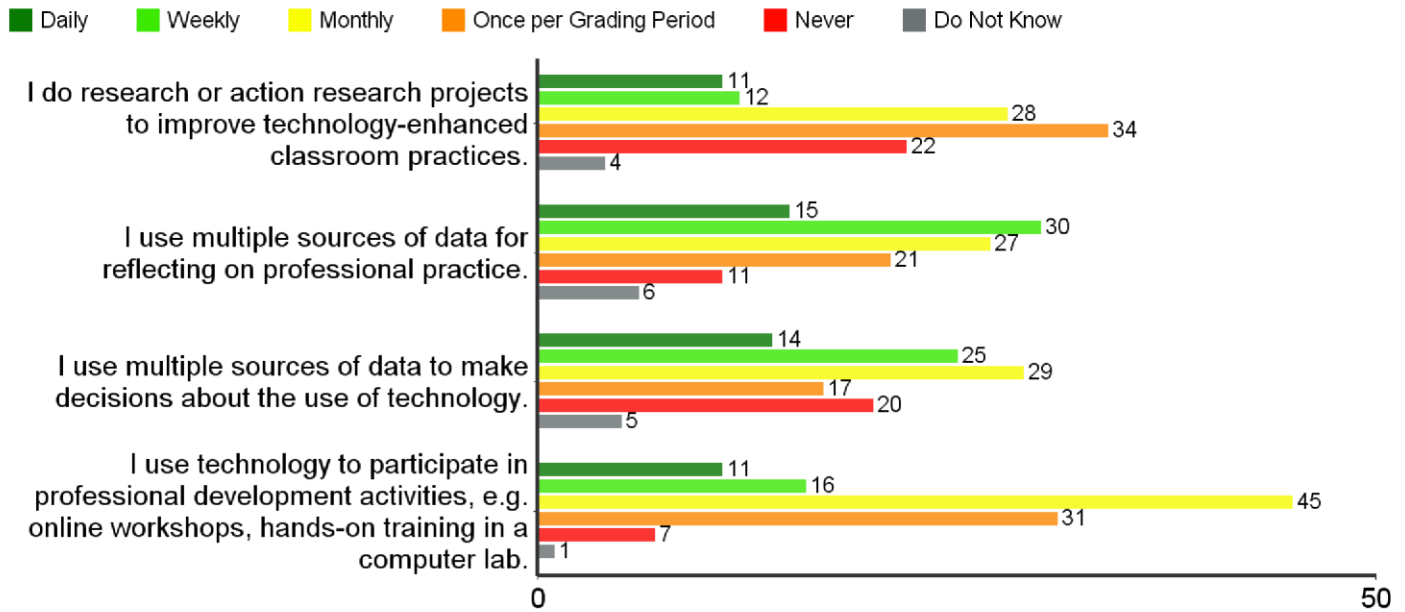
“In the settings where I work with children...”



Item	Daily	Weekly	Monthly	Once per Grading Period	Never	Do Not Know	Total Responses
I use technology to differentiate instruction for students with special learning needs.	13%	27%	19%	15%	20%	6%	111
I use technology to support and increase my professional productivity.	44%	32%	14%	5%	4%	3%	111
I use technology to communicate and collaborate with families about school programs and student learning.	29%	38%	21%	8%	4%	1%	111
I use technology to communicate and collaborate with other educators.	48%	29%	16%	5%	2%	-	111
My lesson plans refer to both content standards and student technology standards.	15%	25%	25%	5%	21%	7%	110

The following statements pertain to **TEACHER TECHNOLOGY USE** (continued).

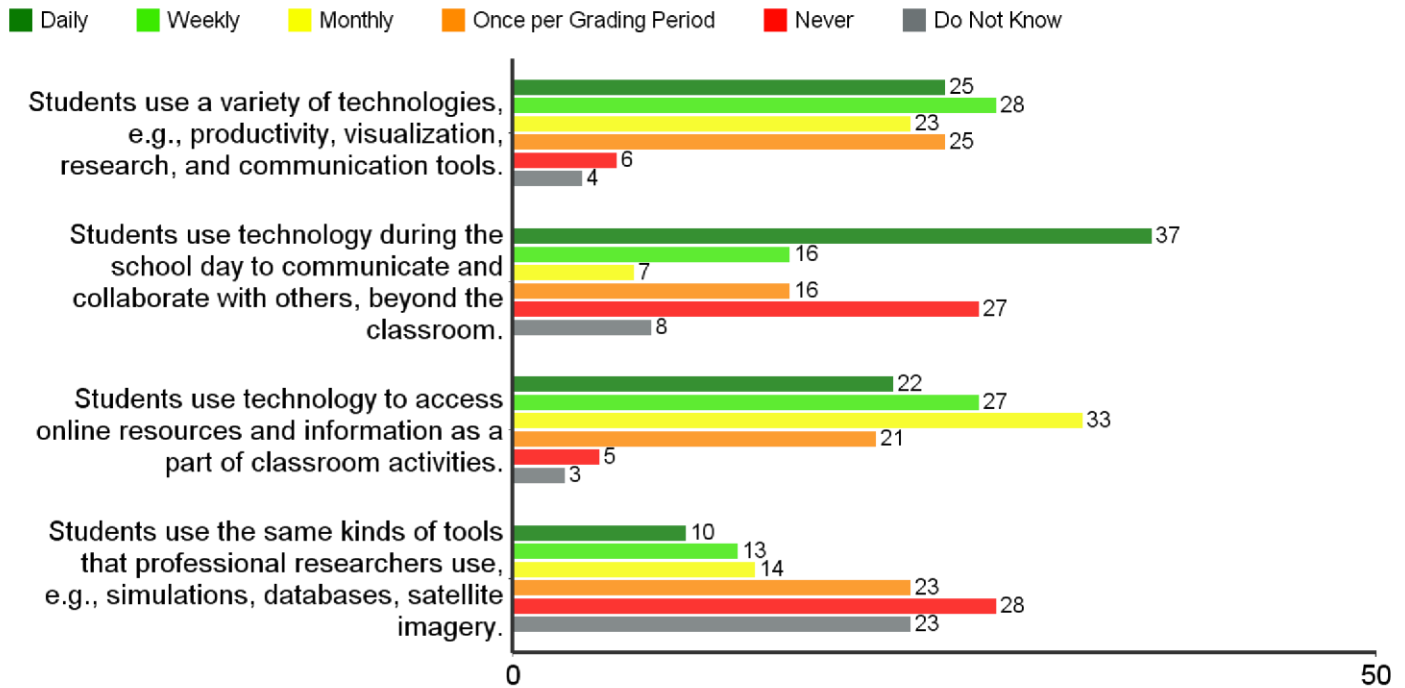
“In the settings where I work with children...”



Item	Daily	Weekly	Monthly	Once per Grading Period	Never	Do Not Know	Total Responses
I do research or action research projects to improve technology-enhanced classroom practices.	10%	11%	25%	31%	20%	4%	111
I use multiple sources of data for reflecting on professional practice.	14%	27%	25%	19%	10%	5%	110
I use multiple sources of data to make decisions about the use of technology.	13%	23%	26%	15%	18%	5%	110
I use technology to participate in professional development activities, e.g. online workshops, hands-on training in a computer lab.	10%	14%	41%	28%	6%	1%	111

The following statements pertain to **STUDENT TECHNOLOGY USE**.

“In the settings where I work with children...”

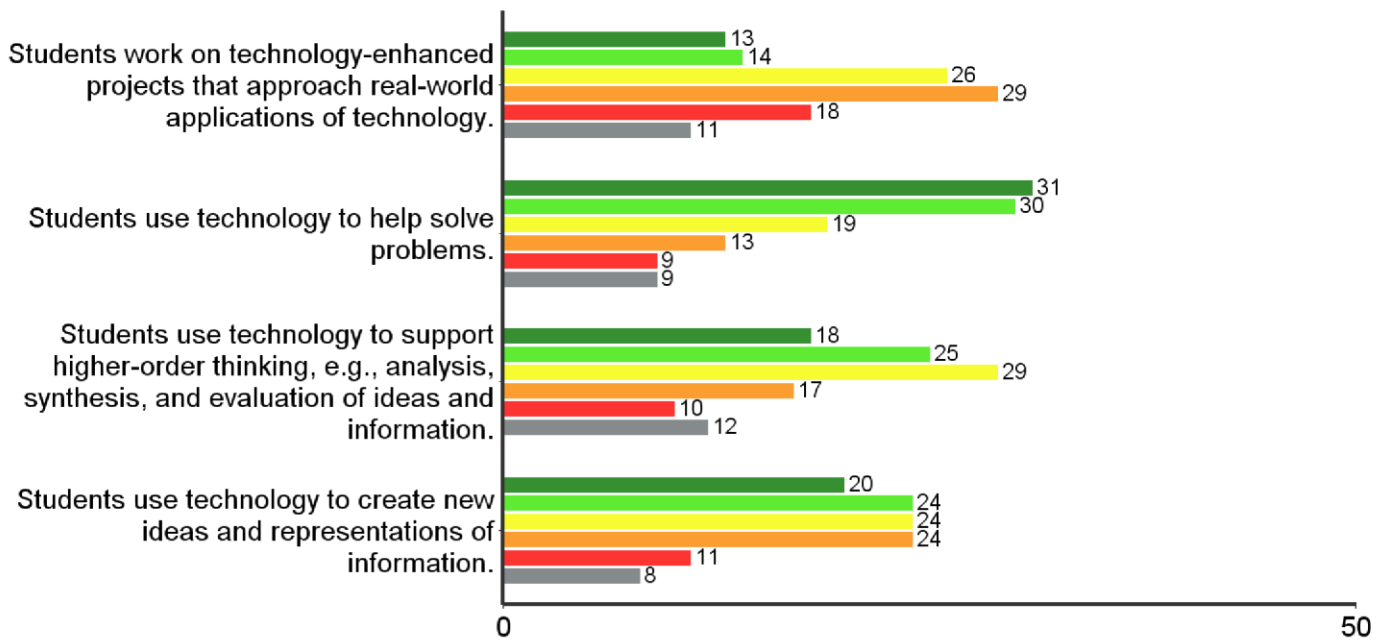


Item	Daily	Weekly	Monthly	Once per Grading Period	Never	Do Not Know	Total Responses
Students use a variety of technologies, e.g., productivity, visualization, research, and communication tools.	23%	25%	21%	23%	5%	4%	111
Students use technology during the school day to communicate and collaborate with others, beyond the classroom.	33%	14%	6%	14%	24%	7%	111
Students use technology to access online resources and information as a part of classroom activities.	20%	24%	30%	19%	5%	3%	111
Students use the same kinds of tools that professional researchers use, e.g., simulations, databases, satellite imagery.	9%	12%	13%	21%	25%	21%	111

The following statements pertain to **STUDENT TECHNOLOGY USE** (continued).

“In the settings where I work with children...”

■ Daily
 ■ Weekly
 ■ Monthly
 ■ Once per Grading Period
 ■ Never
 ■ Do Not Know



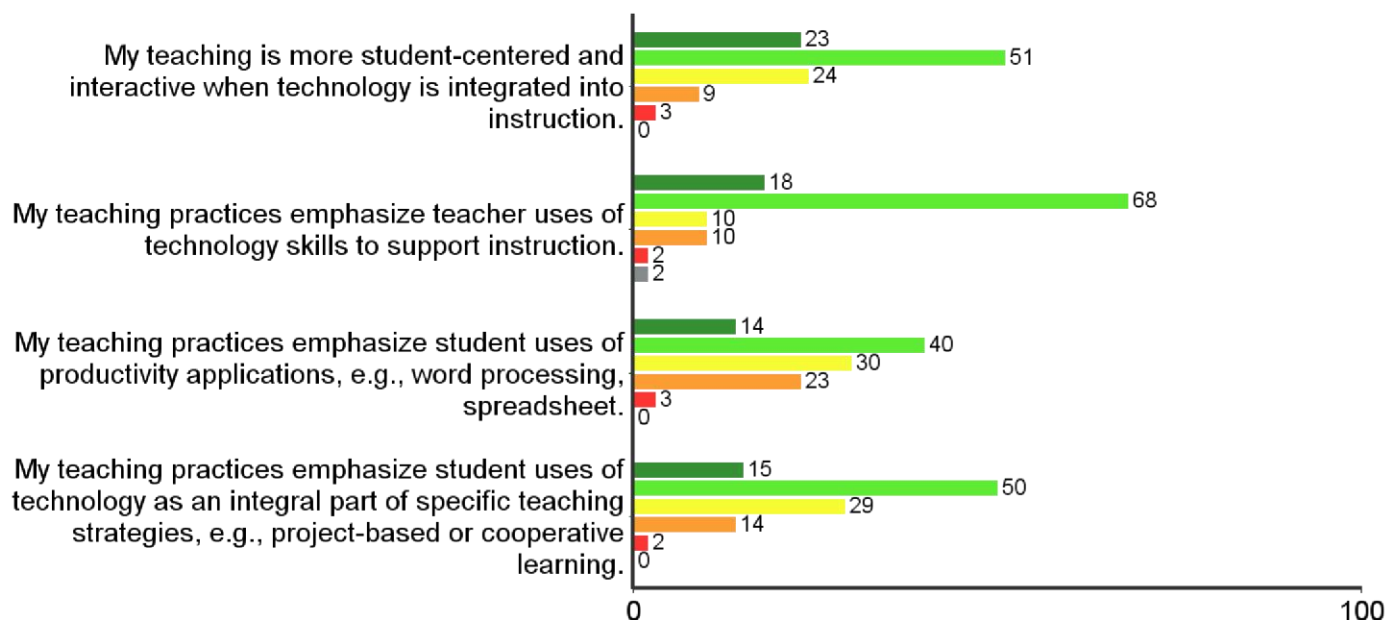
Item	Daily	Weekly	Monthly	Once per Grading Period	Never	Do Not Know	Total Responses
Students work on technology-enhanced projects that approach real-world applications of technology.	12%	13%	23%	26%	16%	10%	111
Students use technology to help solve problems.	28%	27%	17%	12%	8%	8%	111
Students use technology to support higher-order thinking, e.g., analysis, synthesis, and evaluation of ideas and information.	16%	23%	26%	15%	9%	11%	111
Students use technology to create new ideas and representations of information.	18%	22%	22%	22%	10%	7%	111

IMPACT OF TECHNOLOGY

The following statements pertain to **TEACHER IMPACT**.

“In the settings where I work with children...”

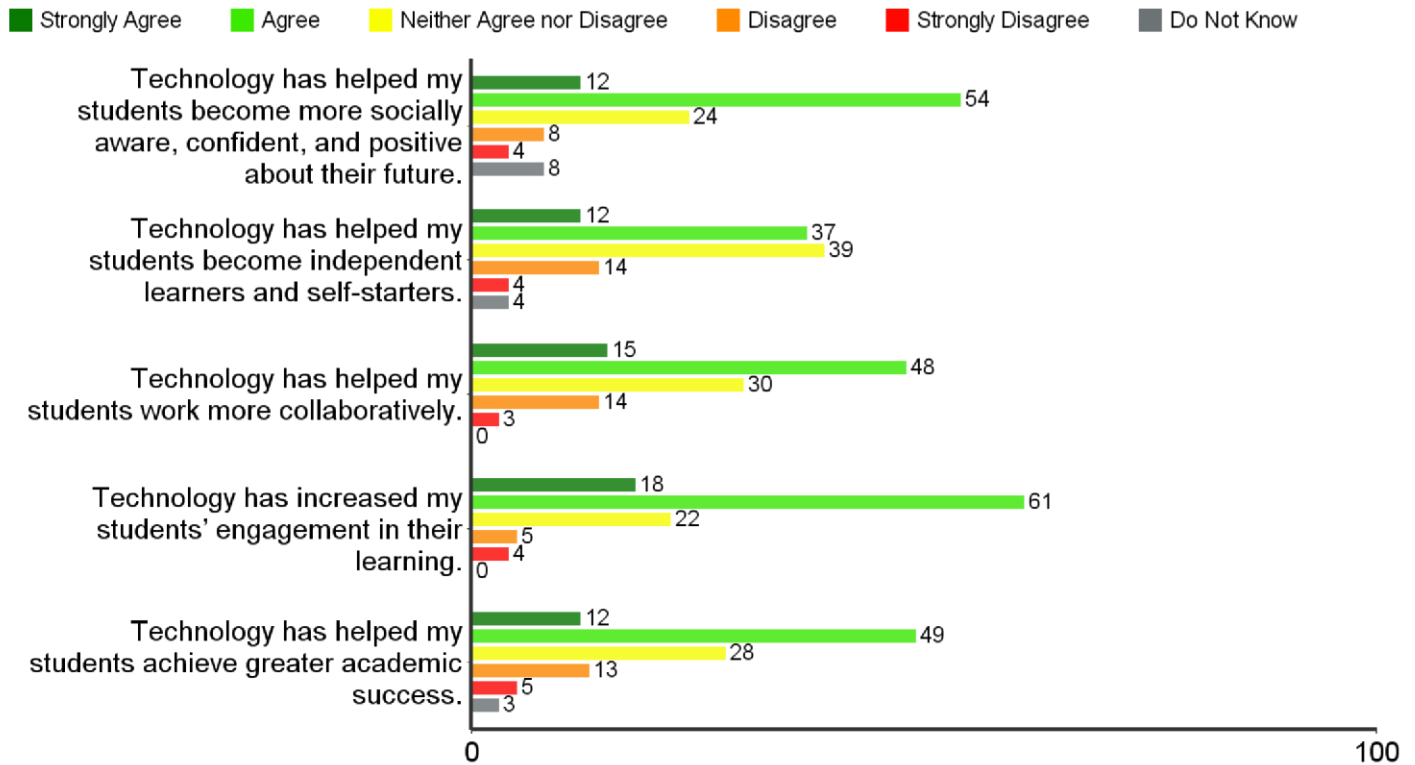
■ Strongly Agree
 ■ Agree
 ■ Neither Agree nor Disagree
 ■ Disagree
 ■ Strongly Disagree
 ■ Do Not Know



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
My teaching is more student-centered and interactive when technology is integrated into instruction.	21%	46%	22%	8%	3%	-	110
My teaching practices emphasize teacher uses of technology skills to support instruction.	16%	62%	9%	9%	2%	2%	110
My teaching practices emphasize student uses of productivity applications, e.g., word processing, spreadsheet.	13%	36%	27%	21%	3%	-	110
My teaching practices emphasize student uses of technology as an integral part of specific teaching strategies, e.g., project-based or cooperative learning.	14%	45%	26%	13%	2%	-	110

The following statements pertain to **STUDENT IMPACT**.

“In the settings where I work with children...”



Item	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Do Not Know	Total Responses
Technology has helped my students become more socially aware, confident, and positive about their future.	11%	49%	22%	7%	4%	7%	110
Technology has helped my students become independent learners and self-starters.	11%	34%	35%	13%	4%	4%	110
Technology has helped my students work more collaboratively.	14%	44%	27%	13%	3%	-	110
Technology has increased my students' engagement in their learning.	16%	55%	20%	5%	4%	-	110
Technology has helped my students achieve greater academic success.	11%	45%	25%	12%	5%	3%	110

Appendix F

School Technology Needs Assessment (STNA) Approval Email

Fw: Instrument Request from the Friday Institute

From Katrina Billups <kzb0037@auburn.edu>

Date Mon 7/7/2025 1:56 PM

To Elisha Wohleb <wohleec@auburn.edu>

■ 4 attachments (2 MB)

STNA.pdf; STNA Instructions.pdf; STNA Interpretation Guide.pdf; STNA Sample Report.pdf;

Good evening,

I have received approval to use their survey. Please find the relevant information attached.

Sent from my Verizon, Samsung Galaxy smartphone

Get [Outlook for Android](#)

From: Joy Alcantara Chuquiruna <jealcant@ncsu.edu>

Sent: Monday, July 7, 2025 1:04:49 PM

To: Katrina Billups <kzb0037@auburn.edu>

Subject: Instrument Request from the Friday Institute

You don't often get email from jealcant@ncsu.edu. [Learn why this is important](#)

Hello,

The materials you requested are attached; consent language and our preferred citations are below. Some of our users request guides for using the surveys, so we have attached such documents as well.

Thank you again for your interest in our evaluation instruments, and best of luck with your work!

Best regards,
Joy Alcantara

YOUR CONSENT:

The Friday Institute grants you permission to use these instruments for educational, non-commercial purposes only. You may use an instrument "as is", or modify it to suit your needs, but in either case please credit its original source - see the citations below. By using this instrument you agree to allow the Friday Institute to use the data collected for additional validity and reliability analysis. You also agree to share with the Friday Institute publications, presentations, evaluation reports, etc. that include data collected and/or results from your use of these instruments. The Friday Institute will take appropriate measures to maintain the confidentiality of all data.

It is not likely that we will follow up with a data request, but we use this standard language for all our instrument requests and do include in the outside chance that the data would be needed for further psychometric testing.

PLEASE USE THE FOLLOWING CITATIONS:

The SERVE Center at University of North Carolina Greensboro (2007). *Student Technology Needs Assessment (STNA)*, Greensboro, NC: Author.

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Joy Alcantara Chuquiruna (she/her)
Research Assistant
Friday Institute for Educational Innovation
NC State College of Education
North Carolina State University
1890 Main Campus Drive
Raleigh, NC 27606
jealcant@ncsu.edu
<http://www.fi.ncsu.edu/>

"All electronic mail messages in connection with state business that are sent to or received by this account are subject to the North Carolina public records law and may be disclosed to third parties."

Appendix G

IRB Approval Email

STUDY00000943 has been approved

 Endeavor IRB <endvirb@auburn.edu>
To:  Katrina Billups

  Reply  Reply all  Forward  

Fri 11/21/2025 1

Template: IRB_T_Post-Review_Approved

Notification of Approval

To: Katrina Billups
Link: [STUDY00000943](#)
P.I.: Elisha Wohleb
Title: Assessing the Digital Divide in Title 1 and non-Title 1
Description: This submission has been approved. You can access the correspondence letter using the following link:
[Correspondence for STUDY00000943 \(1\).pdf\(0.02\)](#)

To review additional details, click the link above to access the project workspace.

Appendix H

EXEMPT DETERMINATION



AUBURN UNIVERSITY

Institutional Review Board

EXEMPT DETERMINATION

November 21, 2025

Elisha Wohleb 3348444434

wohleec@auburn.edu

Dear Elisha Wohleb:

On 11/21/2025, the IRB reviewed the following submission:

Protocol Information	Submission Details
Type of Review:	Initial Study
Title:	Assessing the Digital Divide in Title 1 and non-Title 1 through infrastructure, support, barriers, and technology use in South Alabama Secondary Schools
Investigator:	Elisha Wohleb
IRB ID:	STUDY00000943
Funding:	None
Grant Title:	N/A
Grant ID:	None
IND, IDE or HDE:	None
Documents Reviewed:	<ul style="list-style-type: none"> • HRP-503a - TEMPLATE - Exempt Protocol.pdf, Category: IRB Protocol; • HRP-581 - TEMPLATE - Information Letter (1).pdf, Category: Consent Form; • Survey to committee 8-25-27.pdf, Category: Survey/Questionnaire;

The IRB determined that this protocol meets the criteria for exemption from IRB review. This determination is valid through 11/21/2028. The IRB has implemented a three-year determination period for Exempt submissions to better manage the active research portfolio.

In conducting this protocol you are required to follow the requirements listed in HRP-103
- INVESTIGATOR MANUAL.

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities impact the exempt determination, please submit a modification in the Endeavor system.

Sincerely,

IRB Administration

540 Devall Drive Auburn, AL
36849 irbadmin@auburn.edu

(334) 844-5966

Appendix I

MCPSS (Mobile County Public School System) Approval Email

Thank you!

Sent from my Verizon, Samsung Galaxy smartphone

Get [Outlook for Android](#)

From: Reed, Denita D/Research and Testing <ddreed@mcpss.com>

Sent: Friday, November 7, 2025 10:24:13 AM

To: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Subject: RE: Research Request

You may proceed with the survey.

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>

Sent: Thursday, November 6, 2025 6:30 PM

To: Reed, Denita D/Research and Testing <ddreed@mcpss.com>

Subject: Re: Research Request

The survey will be distributed electronically. The total number of teachers are 399.

Table 1

Middle Schools in the Sample

School Name	Number of Teachers	Title I Status
Clark Shaw Magnet School	30	Yes
Grand Bay Middle	78	Yes
Mobile County Training	15	Yes
Causey Middle School	75	No
Booker T. Washington	18	Yes
Burns Middle	41	Yes

Table 2

High Schools in the Sample

School Name	Number of Teachers	Title I Status
Murphy High School	54	Yes
Citronelle High School	43	Yes
Vigor High School	31	Yes
Faulkner State Career Tech Center	14	No

From: Reed, Denita D/Research and Testing <ddreed@mcpss.com>
Sent: Thursday, November 6, 2025 5:32 PM
To: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Subject: RE: Research Request

What schools and how many teachers at each school are you surveying? How are you disseminating the survey?

From: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Sent: Wednesday, October 29, 2025 9:24 PM
To: Reed, Denita D/Research and Testing <ddreed@mcpss.com>
Subject: Re: Research Request

From: Reed, Denita D/Research and Testing <ddreed@mcpss.com>
Sent: Friday, September 19, 2025 11:29 AM
To: Billups, Katrina M/Clark-Shaw Magnet <kbillups@mcpss.com>
Subject: Research Request

Please complete this attached Research Application and return it to me via email. I would also like to review the survey questions.

Denita Reed
251-221-5219
ddreed@mcpss.com

Appendix J

MCPSS Research Application



Mobile County Public Schools Information and Instructions for Completing Research Application

Please read prior to requesting approval to conduct research.

Purpose

The Mobile County Public School System believes that responsible research is necessary to evaluate and improve educational outcomes. As such, MCPSS encourages qualified individuals and/or organizations to conduct research with the potential to inform educational practices.

Board Policy-Research 4.12

The professional staff is encouraged to conduct educational research aimed at developing, validating and standardizing new or alternative instructional programs, strategies or methods. All formal research or experimental projects using either school system personnel or pupils shall be approved by the superintendent. Informal studies in individual schools may be conducted upon the approval of the local principal. All research programs coordinated by persons or agencies outside the school system and all programs involving multiple schools within the system shall be approved by the superintendent. Summary reports of all research efforts conducted in the school system will be submitted to the superintendent.

Who is required to complete a research application?

All researchers (i.e. graduate students), whether MCPSS employees or non-MCPSS employees, must submit a MCPSS Application to Conduct Research for consideration and have an approval letter from the Division of Research, Assessment, Grants & Accountability prior to making any formal agreements with principals, system staff, parents or students.

What are the guidelines for conducting research in MCPSS?

- All applications for conducting research in MCPSS must be submitted to the Division of Research, Assessment, Grants & Accountability.
- Applications must be submitted electronically.
- Incomplete applications will not be reviewed.
- Once approval from the university's IRB is received, a copy of the approval letter must be submitted to the office of Research, Assessment, Grants & Accountability
- Research permission is valid for one calendar year. No study related activities may continue beyond the expiration date of the original research approval.
- MCPSS will not edit or make changes in application for a researcher.
- The researcher is responsible for ensuring that proposals are free from factual, grammatical, spelling and typographical errors. Proposals containing such errors will not be accepted for review.
- Research projects are prohibited during local/state testing windows, the beginning or end of the school year, end of quarter, and other times of conflict identified by the principals.
- In accordance with the Family Education Rights and Privacy Act (FERPA) regulations, personally identifiable information from a student's educational record will not be disclosed without prior parental consent. Staff members may not be asked to conduct/manage the administration of informed consent for external research projects.
- Pseudonyms must be used for the school division, schools, and any individuals participating in the study in all reports articles, or presentations about the study or its findings.
- A copy of the executive summary must be submitted to the Division of Research, Assessment, Grants & Accountability within 30 days of completion of the project.
- The Division of Research, Assessment, Grants & Accountability must be notified prior to the publication of any results of, or data from, the research study.

Mobile County Public Schools Application to Conduct Research

Section A: Applicant/Researcher Information

Name: Katrina Billups	
Mailing Address: 2905 Brant Dr. Mobile, AL	
Email: kbillups@mcpss.com	Phone: 2512950447
Current Employer: MCPSS (Clark Shaw Magnet School)	Position: CTE Teacher
This research is related to a:	
<input checked="" type="checkbox"/> Dissertation <input type="checkbox"/> Other: _____	
Has any MCPSS employee already agreed to support your research study? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
If yes, please list the name, school/office and position of the MCPSS employee who has agreed to support this study: _____ <small>Sanderson, Edward/Murphy High, Reed, Randal D./Citronelle High, Luffite, Jason D./Faulkner Career Tech Center, Ms. Buchanan/Vigor, Taylor Jackson, Tamesha L./Clark Shaw Magnet, Boucher, Todd E./Grand Bay Middle, Patterson, James N./Mobile County Training, Smith, Jason/Causey Middle, Williams, Craig O./Washington Middle, Knight, Todd/Burns Middle</small>	
Graduate Students Only: Please fill out the information below. <i>MCPSS reserves the right to contact university faculty associated with a proposed research project. Advisor contact information is required for graduate student projects.</i>	
Research Title: Assessing the Digital Divide in Title 1 and non-Title 1 through infrastructure, support, barriers, and technology use in South Alabama Secondary Schools	
University Name: Auburn University	College/Department: Business Education
Advisor's Name: Elisha Wohleb, PhD	Title/Position: Clinical Professor
Email: wohleec@auburn.edu	Phone: 334-844-4434
Have all advisory committee members formally approved this research? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Do you have approval from your university's Institutional Review Board? If so, please provide a copy of the approval letter. <input type="checkbox"/> Approval Received <input checked="" type="checkbox"/> Approval Pending <input type="checkbox"/> NA	
Other Researchers: Is this research sponsored by another organization? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes, please provide the following information regarding the organization.</i>	
Name of Organization: _____	
Contact Name: _____	
Email: _____ Phone: _____	
Type of Study	<input checked="" type="checkbox"/> Quantitative <input type="checkbox"/> Qualitative <input type="checkbox"/> Mixed-Methods
Data Elements	<input type="checkbox"/> Data <input checked="" type="checkbox"/> Surveys <input type="checkbox"/> Other: _____
Participants	<input type="checkbox"/> Elementary School <input type="checkbox"/> Principals <input type="checkbox"/> Other: <input checked="" type="checkbox"/> Middle School <input checked="" type="checkbox"/> Teachers <input checked="" type="checkbox"/> High School <input type="checkbox"/> Students

Mobile County Public Schools Application to Conduct Research

Section C: Proposed Study Information

Overview:

What is the general purpose of the research? (300 words or less)

This study aims to investigate the availability and use of digital devices and tools in secondary education classrooms across South Alabama. It will analyze whether significant differences exist in technological access and integration based on factors such as Title I status, classification, and school ratings. The research will also explore the barriers, both extrinsic and intrinsic, that hinder technology. Moreover, this research will investigate how often technology integration/practices occurs.

Research Questions:

What are the primary questions to be addressed by this research?

RQ1: How does the infrastructure and staff support vary based on specific demographic factors, including Title I status, school classification, and school rating?

RQ2: What barriers do teachers perceive as preventing access to technology in Title I and non-Title I schools?

RQ3: How often do teachers use technology to improve teaching and learning and is there a difference based on demographic factors, including Title I status, years of experience, gender, and level of certification?

Research:

Summarize relevant theory and relevant research. (Include references; 300 words or less)

This study examines the disparities in technology access and educational resources between Title I and non-Title I secondary schools in South Alabama. Dijk (2004) emphasized that Digital Divide Framework focuses on the gap between individuals and communities that have access to modern information and technology. The framework identifies three levels of digital divide:

1. First-Level Digital Divide – Differences in access to physical technology, such as computers, tablets, and internet connectivity.
2. Second-Level Digital Divide – Variations in how technology is used, including disparities in digital literacy, instructional integration, and teacher training.
3. Third-Level Digital Divide – The long-term consequences of unequal technology access, including impacts on student achievement, career readiness, and social mobility.

Title I schools, which serve a high percentage of low-income students, often face significant technological challenges compared to non-Title I schools. In th

Mobile County Public Schools Application to Conduct Research

Research Method:

Provide a summary of your research design (procedures, methods, analysis, etc.), including specific actions, you will take to meet the stated purpose of the study and answer the research questions (300 words or less).

The study employs a nonexperimental, quantitative survey research design to investigate technology access, barriers, and usage among secondary school teachers in South Alabama. The purpose is to examine how infrastructure and staff support vary across demographic factors, identify teacher-perceived barriers to technology integration, and explore the frequency of technology use in teaching and learning.

The target population includes teachers in grades 6-12 across 12 schools in the Mobile County Public School System and Ascot Academy Charter Career Tech Center, representing both Title I and non-Title I contexts. Principals provided approval for participation, and surveys were distributed electronically via Qualtrics to ensure confidentiality and compliance with district and state guidelines.

The survey instrument was adapted from the School Technology Needs Assessment (STNA), developed by the G21CNC Center and Policy Institute, and modified to align with the study's purpose. The final instrument includes four sections: (1) infrastructure and staff support, (2) teacher-perceived barriers, (3) frequency of technology use, and (4) demographic information. Responses are measured using Likert-type scales and categorical checkboxes.

Procedures included initial survey distribution, follow-up reminders, and secure data collection through Qualtrics. Participation was voluntary, with no personally identifiable information collected.

Analysis will use descriptive statistics (means, frequencies, percentages) to summarize teacher perceptions. Inferential statistics will examine group differences, chi-square tests for categorical comparisons, independent samples t-tests for mean differences, and one-way and factorial ANOVAs to analyze demographic effects on infrastructure, support, and frequency of use. Logistic regression will be employed to predict likelihood of reporting specific barriers based on teacher characteristics such as years of experience, certification level, and gender. Reliability will be established using Cronbach's alpha, and expert review ensured content validity.

This design enables identification of trends and group differences without manipulation of variables, providing meaningful insights into the digital divide across Title I and non-Title I secondary schools.

Requesting Existing Data for Your Study

Describe data collection and analysis procedures.

Are you requesting to use existing data provided by the district? Yes No

If yes, what data elements are you requesting? Demographics Attendance Discipline Grades/Courses Assessments

Other

If other, please explain:

Detailed Description of Variables (Please be as specific as possible):

Reporting Out

How will the results be reported? Include the purpose and audience for each type of publication and presentation. Note: MCPSS requires an executive summary (500 words or less) within 30 calendar days of the final report date. This summary should be emailed to shinton@mcpss.com and will be used at the discretion of MCPSS

The results of this study will be disseminated through multiple formats to serve academic, professional, and education-level audiences. Each type of reporting will be tailored in length, detail, and focus to meet the needs of its intended audience.

Doctoral Dissertation:

Purpose: To fulfill the requirements of the Doctor of Philosophy degree at Auburn University and provide a comprehensive analysis of the digital divide in South Alabama secondary schools.

Audience: Dissertation committee, university faculty, graduate students, and future researchers.

Article: The full dissertation will be archived in Auburn University's digital repository and will include complete data analysis, findings, and implications for policy and practice.

Benefits of research study

How will the research study directly and indirectly benefit the students and/or stakeholders of MCPSS?

This study will provide both direct and indirect benefits to the Mobile County Public School System (MCPSS). Directly, the research will identify specific infrastructure, staff support, and technology-related barriers, giving district leaders actionable data to guide resource allocation and policy decisions. Teachers will also benefit by gaining insight into effective strategies and professional development needs, which can support stronger integration of technology in instruction. Indirectly, the findings will help improve student learning experiences by expanding access to digital tools and promoting equitable opportunities across Title I and non-Title I schools. Over time, these improvements will enhance digital literacy, workforce readiness, and college preparation for MCPSS students. The study also strengthens community and stakeholder engagement by providing evidence-based recommendations that can support funding requests and partnerships. Ultimately, the research promotes MCPSS's mission to deliver equitable, high-quality education for all students.

Mobile County Public Schools Application to Conduct Research

Supporting Documents

Appropriate required documentation should be submitted. Applications missing required and applicable appendices will not be reviewed. Indicate appendices below:

<input checked="" type="checkbox"/> Approval form from Institutional Review Board (IRB)
<input checked="" type="checkbox"/> Informed Consent Form
<input checked="" type="checkbox"/> Questionnaire/Survey
<input type="checkbox"/> Additional Research Design, Methodology, and Data Analysis
<input type="checkbox"/> Other (please specify):

Timeline:

Pending approval, enter approximate dates for each of the following events. Please Note: Research activities must be scheduled at a time that is convenient and beneficial to all the participants involved in the study. Therefore, consideration should be given to refrain from scheduling activities during periods of time such as: the beginning/ending of the school year, end of the quarter, or statewide assessments.

Application Submitted to MCPSS	
Data Request-Archival <i>(Time needed will vary, depending on the complexity of the request; at minimum, allow 3 business weeks.)</i>	
Data Collection-Survey <i>(These must be administered electronically through the MCPSS Division of Research, Assessment, Grants & Accountability)</i>	
Other: <i>(please explain)</i>	
Anticipated date for submitting an abstract of the research findings to MCPSS	

Certification Statement:

In submitting this application, I certify that the application is an accurate and complete description of my proposed research study. I assure the Mobile County Public School System that the research activities to be conducted are in compliance with all existing legal and ethical codes, regulations, as well as the Federal Policy for the Protection of Human Subjects, the Educational Protections for Children Involved as Research Subjects, Family Educational Rights and Privacy Act and Protection of Pupil Rights Amendments. Furthermore, I assure that all data collected for this study will be kept confidential in compliance with the Education Rights and Privacy Act. The approval to conduct research does not obligate any school, staff, student, or parent to participate, as all participation remains voluntary. I also agree to share my final report and findings with the MCPSS district no later than one year following the conclusion of the research.



 Signature of Applicant

10/29/25

Date