IMPACT OF TECHNOLOGY ON TEACHING AND LEARNING IN PRIMARY AND SECONDARY SCHOOLS IN EGOR, EDO STATE .

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF EDUCATIONAL MANAGEMENT, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY. IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELORS OF SCIENCE (B.Sc Ed) DEGREE IN EDUCATIONAL MANAGEMENT

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CERTIFICATION

This is to certify that the project titled: Impact of Technology on Teaching and Learning in Primary and Secondary Schools in Egor, Edo State was carried out by Jane OMOKARO of the Department of Educational Management, Faculty of Education, University of Benin, Benin-City.

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DEDICATION

I dedicate this to God Almighty for making this a reality. To my lovely Parents, Thank you.

AKNOWLEGDEMENTS

My profound gratitude goes to God Almighty, the giver of life and knowledge, my present help in times of need, and the one who has helped me throughout this phase.

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ABSTRACT

This study examines the effects of technology on teaching and learning in primary and secondary schools in Egor Local Government Area, Edo State. The study investigates the availability of technological tools, the extent to which teachers and students utilize technology, and its impact on students' academic performance. A total of 150 respondents, comprising teachers and students, participated in the study. Data was collected using structured questionnaires and analyzed using descriptive statistics, including frequency distribution, percentages, and mean scores.

The findings reveal that technological tools such as computers, projectors, and internet access are widely available in schools, with strong administrative support for technology integration. The results also indicate that teachers frequently use technology to deliver lessons, while students engage in research, projects, and collaborative learning using digital tools. Furthermore, the study finds that technology significantly enhances students' academic performance by improving comprehension, problem-solving skills, and motivation. However, challenges such as limited funding, outdated equipment, and restricted access in some schools were identified.

Based on these findings, the study recommends continuous investment in modern technological infrastructure, regular training for teachers on digital pedagogy, and policies to ensure equitable access to technology among students. Enhancing technological integration in schools will further improve the quality of education and learning outcomes in the study area.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Technology refers to the use of digital tools, systems, and resources to enhance teaching and learning processes. This includes devices such as computers, projectors, interactive whiteboards, and educational software, as well as access to the internet and online platforms that facilitate interactive learning, communication, and resource sharing. According to Bates (2015), educational technology "comprises the use of technologies to support the process of education, whether through improved instruction, management of educational programs, or creating new learning opportunities." Technology in education aims to improve the efficiency, accessibility, and quality of learning experiences, enabling both teachers and students to engage more effectively in the educational process. In recent years, there has been a global shift toward technology-enhanced learning as digital tools, educational software, and online resources transform traditional teaching methods(Brown, A.;2020). . This transformation is driven by advancements in information and communication technologies (ICT) and the increasing accessibility of the internet and digital devices. The integration of technology in education has moved beyond using computers for word processing or basic research. Today, it involves sophisticated applications such as virtual learning environments, interactive whiteboards, and adaptive learning technologies that personalize the learning experience for students based on their individual needs. Globally, the reliance on technology in education has

risen significantly, with digital platforms and e-learning tools becoming integral to modern classrooms. From video conferencing software like Zoom to collaborative tools such as Google Classroom, technology has facilitated a more flexible and inclusive learning environment, allowing students to access education anytime, anywhere. The COVID-19 pandemic accelerated this shift, demonstrating the necessity of technology in maintaining continuity in education during disruptions.

In Nigeria, technology's influence on education is also growing. Schools are increasingly adopting digital tools to enhance both teaching and learning processes. Although challenges such as infrastructure deficits and limited digital literacy persist, efforts are being made to integrate technology, particularly in urban centers. This shift is evident in both primary and secondary schools, where teachers use technology to engage students through multimedia resources, online assessments, and educational apps. However, the pace of technology adoption varies widely, with urban schools generally ahead of their rural counterparts.

The global shift towards technology-enhanced learning has transformed traditional teaching methods, with digital tools, educational software, and online resources becoming integral parts of the modern classroom. As technology continues to permeate every aspect of society, its role in education has grown increasingly significant. Across the world, educators are leveraging technology to create more dynamic, interactive, and personalized learning experiences. This global trend has not bypassed Nigeria, where primary and secondary schools are beginning to adopt various forms of

technology to improve teaching and learning outcomes. In particular, the integration of technology in education is gaining traction in local regions such as Egor Local Government Area of Edo State. The use of technology in Nigerian schools is not entirely new. Over the years, the Nigerian government has made concerted efforts to introduce technology into the educational sector, recognizing its potential to enhance the quality of education. Early initiatives saw the introduction of computers in schools, supported by government policies aimed at fostering digital literacy. Significant milestones include the establishment of programs by the Universal Basic Education Commission (UBEC) that emphasized the importance of ICT in education, as well as various government investments aimed at integrating digital tools into the classroom. Despite these efforts, the pace of technology adoption has been uneven, with many schools, particularly in rural areas, lagging behind due to infrastructural challenges and limited resources.

In Egor Local Government Area, the adoption of technology in schools presents a mixed picture. While some schools have started integrating tools such as computers, projectors, and smartboards into their teaching, the extent of technology use varies significantly between institutions. Internet access, a critical enabler of digital learning, remains limited in many schools, further exacerbating disparities in educational quality. The benefits of integrating technology into education are numerous. Technology enhances student engagement and motivation by offering interactive and multimedia learning experiences that are more captivating than traditional textbooks. It also provides access to a vast range of educational resources, allowing students to explore topics in

greater depth and from diverse perspectives. Furthermore, technology enables personalized learning, catering to different learning styles and paces, and ensuring that students receive individualized instruction that meets their unique needs. Teachers, too, benefit from technology, as it streamlines tasks such as lesson planning, assessment, and communication, allowing them to focus more on delivering quality instruction. Perhaps most importantly, the integration of technology promotes digital literacy, equipping students with essential skills for the future.However, the adoption of technology in schools in Egor LGA faces several challenges. Many schools lack the necessary infrastructure, such as computers and reliable internet connectivity, to fully utilize digital learning tools. Insufficient funding further exacerbates this issue, as schools struggle to acquire and maintain up-to-date technology. Additionally, many teachers have not received adequate training on how to effectively incorporate technology into their teaching, resulting in underutilization of available resources. Socioeconomic barriers also play a role, as not all students have access to technology at home, deepening the digital divide. The unreliable power supply in many areas poses yet another challenge, disrupting the use of technology in the classroom, particularly in under-resourced schools. Research on the impact of technology on teaching and learning outcomes has shown that, when properly integrated, technology can significantly enhance student performance, engagement, and critical thinking skills. Studies have demonstrated that students who use technology in their learning tend to perform better in terms of understanding and retaining complex concepts. Moreover, technology fosters the development of problem-

solving skills and encourages collaboration and creativity. However, these positive effects depend on the effective use of technology. In cases where technology is not properly integrated into the curriculum, its impact may be minimal, and over-reliance on digital tools can sometimes have negative effects, such as reducing attention spans. The Nigerian government has recognized the importance of technology in education and has implemented various policies to promote its use in schools. The National Policy on Education highlights the role of ICT in enhancing teaching and learning and encourages the establishment of ICT centers in schools. The National Information Technology Development Agency (NITDA) has also played a significant role in advancing ICT infrastructure in schools, providing computers and internet access, and training teachers in ICT skills. In Edo State, the EdoBEST (Basic Education Sector Transformation) initiative has made strides in integrating technology into the classroom, providing teachers with tablets preloaded with lesson plans and instructional materials. Despite these efforts, there is still a need for sustained investment and more effective implementation strategies to ensure that all schools, particularly those in under-resourced areas like Egor LGA, have access to the technology they need to improve teaching and learning outcomes

1.2 Statement of the Problem

Before the introduction of technology in education, teaching and learning in schools across Nigeria, including Egor Local Government Area of Edo State, were largely traditional and resource-constrained. Classrooms relied heavily on chalkboards,

textbooks, and teacher-centered approaches. Information access was limited, and learning was often passive, with students playing a minimal role in their own educational process. There was little opportunity for interactive, personalized learning, and educational outcomes were frequently hindered by outdated methods and limited instructional tools. The advent of technology promised to revolutionize education by introducing tools that could enhance learning experiences, foster student engagement, and improve academic performance. .

Today, while some progress has been made in incorporating technology into education, significant disparities remain. Collins and Halverson (2018) noted that technological advancements like interactive learning platforms and personalized educational tools offer promising opportunities, but their widespread implementation is often hindered by inadequate policies, limited funding, and resource constraints, particularly in underdeveloped areas.

1.3 Research Questions

To guide this study, the following research questions have been formulated:

1. What technological tools and resources are available for teaching and learning in primary and secondary schools in Egor Local Government Area?
2. How are teachers and students utilizing technology in the classroom?
3. What effect does technology have on students' academic performance?
4. What challenges do teachers and students face in the integration of technology in teaching and learning?

1.4 Purpose of the Study

The main objective of this study is to examine the effect of technology on teaching and learning in primary and secondary schools in Egor Local Government Area of Edo State. The specific objectives are:

1. To assess the availability of technological tools and resources in primary and secondary schools.
2. To evaluate how technology is being used in teaching and learning processes.
3. To investigate the impact of technology on students' academic performance and learning outcomes.
4. To identify the challenges faced by teachers and students in utilizing technology for educational purposes.

1.5 Significance of the Study

This study holds significant importance as it contributes to the ongoing global discourse on the transformative role of technology in education, with a particular focus on developing countries such as Nigeria. In an era where digital tools are increasingly being recognized as essential to modern education, understanding the state of technological adoption in specific local contexts is crucial. By concentrating on primary and secondary schools in Egor Local Government Area, this study offers a localized perspective on how technology is shaping the educational landscape. The findings from this research will shed light on the current level of technological integration, the types of tools and platforms in use, and how they affect learning outcomes such as student

engagement, comprehension, and academic performance. For policymakers, this study will provide critical data on the gaps that exist in the technological infrastructure of schools in Egor Local Government Area. Such data is essential for crafting policies that ensure equitable access to digital tools, particularly in rural or resource-constrained areas. The findings will also assist in evaluating whether existing government initiatives, such as the integration of Information and Communication Technology (ICT) in schools, are being implemented effectively or if further investment is required to bridge the digital divide.

For educational administrators, the study offers a framework for assessing the effectiveness of technology in enhancing the quality of education. The research can guide decision-makers in allocating resources more effectively, prioritizing investments in technological tools that have the greatest impact on teaching and learning. Additionally, it will help school administrators identify the training needs of teachers, ensuring that they are equipped to integrate technology into their pedagogical methods successfully. For teachers, this research will provide practical insights into how technology can be better utilized in the classroom. The study will explore the challenges teachers face, such as a lack of training or resources, and propose strategies for overcoming these obstacles. Teachers will also gain an understanding of how different technological tools can enhance student engagement and improve the effectiveness of their lessons. For example, interactive platforms and e-learning tools have been shown to promote active learning and personalized instruction, but their adoption has been inconsistent in many Nigerian

schools (Adeoye, 2020). Additionally, for students, the significance of this study lies in its potential to improve the quality of their educational experience. By identifying the barriers to effective technology use, such as inadequate internet access or limited exposure to digital tools, the research aims to suggest ways in which these barriers can be overcome, thereby enhancing the overall learning environment. This is especially relevant in a world where digital literacy is becoming as crucial as traditional literacy, and where technology-based skills are increasingly in demand in the job market (Olumuyiwa & Adebola, 2021). Finally, the study will serve as a valuable reference for future researchers. By focusing on a specific geographical area and educational level, this research provides a case study that can be compared to other regions in Nigeria or similar developing countries. This comparative analysis will enrich the existing literature on educational technology, offering insights into how technological interventions can be scaled or modified to suit diverse educational contexts.

1.6 Scope of the Study

This study focuses on primary and secondary schools in Egor Local Government Area of Edo State. It will cover the availability and use of technological tools in teaching and learning, the impact of these tools on students' academic performance, and the challenges encountered in the integration of technology in Qualitative data will be gathered through a structured questionaire .The study will not extend beyond the specified geographic location or educational levels, thus limiting its findings to the primary and secondary education systems within Egor Local Government Area.

1.7 Limitations of the Study

The study is limited by several factors, including the availability of data on technological usage in schools and the willingness of teachers and students to participate in the survey. Another limitation may be the uneven distribution of technology across schools, which could skew the findings. Additionally, time constraints and financial limitations may restrict the depth of data collection.

1.8 Definition of Terms

Technology in Education: Refers to the use of digital tools and resources such as computers, the internet, and software applications to support teaching and learning processes.

Teaching: The act of imparting knowledge, skills, and values to students by educators using various methods, including traditional and technology-enhanced approaches.

Learning: The process through which students acquire knowledge, skills, and competencies, often evaluated through assessments and academic performance.

E-learning: A learning system based on formalized teaching but with the help of electronic resources, often involving internet access.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a comprehensive review of the literature pertinent to the effects of technology on teaching and learning, particularly in primary and secondary education within Egor Local Government Area of Edo State.The review examines

- Concepts of The Role of Technology in Education
- Technology-Enhanced Teaching Methodologies
- Impact of Technology on Student Engagement and Motivation
- Academic Performance and Learning Outcomes
- Challenges of Technology Integration in Education
- Technology in Primary and Secondary Education in Egor Local Government Area
- Empirica Reviews
- Summary and Gap in the literature reviewed

2.2 Conceptual Framework

The Role of Technology in Education

Technology has fundamentally transformed the educational landscape, reshaping how teaching and learning occur. With the advent of various digital tools and resources, educators can enhance instructional methods and create more engaging and effective learning environments. Research indicates that when technology is effectively integrated into the classroom, it can lead to significant improvements in educational outcomes. For

instance, Puentedura (2014) highlights the SAMR model (Substitution, Augmentation, Modification, and Redefinition), which emphasizes that technology should not only replace traditional methods but also transform learning experiences. This transformation can lead to deeper learning and greater student engagement. One of the key advantages of integrating technology in education is its ability to facilitate differentiated instruction. Differentiated instruction recognizes that students have varied backgrounds, learning preferences, and readiness levels. As Tomlinson (2014) asserts, technology allows educators to tailor learning experiences to meet the diverse needs of students. For example, adaptive learning technologies can provide personalized pathways that enable students to progress at their own pace, ensuring that each learner receives the appropriate level of challenge and support. This individualized approach not only enhances student understanding but also promotes a sense of ownership over their learning process. In addition to differentiation, technology plays a vital role in supporting collaborative learning. Digital platforms such as Google Classroom, Microsoft Teams, and various educational apps foster communication and teamwork among students (Johnson et al., 2014). These tools allow students to engage in collaborative projects, share resources, and provide feedback to one another, thus enhancing their learning experiences. Collaborative learning through technology encourages peer interaction, promotes critical thinking, and helps students develop essential social skills that are crucial for success in the 21st century.

Furthermore, technology enhances access to information and resources beyond traditional classroom materials. The internet provides students with a vast array of knowledge and learning resources, allowing them to explore topics in greater depth (Kuhlthau et al., 2015). This access to information supports self-directed learning and empowers students to take charge of their educational journeys. As they navigate digital resources, students also develop essential skills in information literacy, critical thinking, and problem-solving, all of which are vital for success in a rapidly changing world. Moreover, the integration of technology in education can help bridge gaps in accessibility for students with disabilities. Assistive technologies, such as screen readers, speech-to-text software, and specialized learning tools, enable students with diverse needs to participate more fully in the learning process (Alper & Raharinirina, 2006). This inclusivity not only benefits individual learners but also enriches the classroom environment by promoting diversity and empathy among students. In summary, the role of technology in education is multifaceted, offering innovative tools and resources that enhance teaching and learning. Effective technology integration can lead to improved educational outcomes, facilitate differentiated instruction, support collaborative learning, and increase access to information. As educators continue to explore and implement technological solutions, it is essential to remain mindful of the need for professional development and support to ensure that all stakeholders can maximize the potential of technology in the classroom.

Technology-Enhanced Teaching Methodologies

Various technological tools and methodologies have emerged to enhance teaching practices, significantly transforming the educational experience for both educators and students. One prominent approach is blended learning, which combines traditional face-to-face instruction with online components. This method has gained traction in recent years, offering a versatile framework that accommodates diverse learning preferences and needs. Graham (2013) emphasizes that blended learning allows for greater flexibility and personalization of learning pathways, enabling educators to tailor instruction to individual students. This flexibility is particularly beneficial in addressing the varying paces at which students learn, as it allows them to engage with materials at their own speed, revisit content as needed, and explore additional resources that can deepend their understanding. In addition to blended learning, the integration of educational software and multimedia resources plays a crucial role in enhancing the curriculum. Tools such as interactive simulations, educational games, and instructional videos engage students more effectively than traditional teaching methods (Moreno & Mayer, 2007). For example, simulations can provide students with experiential learning opportunities that allow them to apply theoretical knowledge in practical scenarios, thereby solidifying their understanding of complex concepts. Educational videos can present information in visually appealing ways, making it easier for students to grasp challenging topics and retain information.

Furthermore, technology-enhanced teaching methodologies foster collaboration and communication among students. Online discussion forums, collaborative document editing, and virtual group projects encourage peer interaction, enabling students to work together regardless of physical location. This collaborative environment not only enhances learning but also builds essential skills such as teamwork, problem-solving, and critical thinking, which are vital for success in today's interconnected world.

Research by Lim and Wong (2014) underscores the importance of teacher training in technology integration. They argue that educators who are proficient in using technology are better equipped to implement innovative teaching strategies that positively affect student learning outcomes. Professional development programs that focus on enhancing teachers' technological competencies are essential for effective integration. Such training empowers educators to select and utilize appropriate technological tools, design engaging learning activities, and assess student progress effectively. Without adequate training and support, educators may struggle to leverage technology to its full potential, potentially leading to underwhelming results in student engagement and achievement. Additionally, the role of technology in assessment practices cannot be overlooked. Digital assessment tools allow for more timely and efficient evaluation of student performance, enabling educators to provide immediate feedback and support where necessary. Online quizzes, interactive assessments, and digital portfolios facilitate continuous assessment and help educators monitor student progress in real-time, allowing for timely interventions and tailored instruction. In summary, technology-enhanced

teaching methodologies, such as blended learning and the use of multimedia resources, significantly enrich the educational experience. The success of these methodologies hinges on effective teacher training and professional development, which equip educators with the necessary skills to integrate technology seamlessly into their instruction. As technology continues to evolve, ongoing training and support will be essential in ensuring that teaching practices keep pace with the changing educational landscape.

Impact of Technology on Student Engagement and Motivation

Technology has a profound impact on student engagement and motivation, which are critical factors for effective learning. Research consistently shows that when integrated thoughtfully into the classroom, technology can enhance students' enthusiasm for learning and their willingness to participate in educational activities. A study by Hwang et al. (2019) found that students who used technology in the classroom exhibited higher levels of motivation and interest in learning activities compared to their peers in traditional learning environments. This increase in motivation can be attributed to various factors, including the interactive and dynamic nature of technological tools that promote active learning.

One notable technological approach that enhances engagement is the use of gamified learning platforms. These platforms incorporate game-like elements into educational content, making learning more enjoyable and stimulating. Deterding et al. (2011) highlight how the interactive nature of gamified tools captures students' attention and encourages active participation. For example, students may earn points, badges, or

rewards for completing tasks or achieving learning milestones, which not only incentivizes engagement but also provides immediate feedback on their progress. This type of reinforcement can significantly enhance students' intrinsic motivation to learn, as they perceive learning as a fun and rewarding experience rather than a chore. Moreover, technology facilitates access to a wealth of information and resources that extend beyond traditional textbooks. As noted by Kuhlthau et al. (2015), digital libraries and online databases provide students with the opportunity to explore subjects in greater depth, fostering a sense of ownership over their learning. With the ability to access diverse materials—such as academic articles, educational videos, and interactive simulations—students can engage in self-directed learning, tailoring their exploration to their interests and learning styles. This autonomy is critical for fostering motivation, as students feel empowered to take charge of their educational journeys and pursue topics that resonate with them personally.The shift from passive consumption of information to active engagement through technology also transforms the way students approach learning. For instance, tools like collaborative online platforms encourage students to work together on projects, share ideas, and provide feedback to one another, thereby promoting a sense of community and shared responsibility for learning. This collaborative environment not only enhances engagement but also helps develop critical social skills that are essential for success in both academic and professional settings. Additionally, the use of technology in education can help to create personalized learning experiences, which are known to increase student motivation. Adaptive learning technologies can analyze

students' performance and adjust the difficulty of tasks accordingly, ensuring that learners are consistently challenged without feeling overwhelmed (Pane et al., 2015). This personalized approach to education allows students to progress at their own pace, reinforcing their motivation and engagement as they experience success in their learning efforts. In conclusion, technology significantly impacts student engagement and motivation by fostering interactivity, providing access to extensive resources, and facilitating personalized learning experiences. As educators continue to integrate technology into their teaching practices, understanding the positive effects on student motivation will be essential for designing effective instructional strategies that enhance the overall learning experience.

Academic Performance and Learning Outcomes

The relationship between technology use and academic performance has been a focal point of educational research, drawing significant interest from educators and policymakers alike. In recent years, the integration of technology in classrooms has increased exponentially, prompting inquiries into its impact on student learning and achievement. Numerous studies have examined this connection, revealing a complex landscape where the outcomes of technology use can vary significantly based on several factors, including implementation strategies, pedagogical approaches, and the specific technologies employed.

Research indicates that technology integration can enhance academic achievement when it is thoughtfully aligned with instructional goals and effectively woven into the

curriculum. A meta-analysis by Cheung and Slavin (2013) highlights that technology can have a positive effect on academic performance, particularly when it supports interactive learning and collaborative activities. For instance, the use of educational software that provides personalized learning experiences allows students to work at their own pace, thus accommodating diverse learning styles and needs. This personalized approach not only fosters engagement but also facilitates deeper understanding, leading to improved academic outcomes. However, the effectiveness of technology in enhancing academic performance is not universally accepted. Hattie (2012) emphasizes that the mere presence of technology in educational settings does not guarantee improved learning outcomes. His research points out that without proper pedagogical frameworks and strategies, technology can become a distraction rather than a tool for learning. Hattie argues for a more nuanced understanding of how technology can be leveraged to promote higher-order thinking skills, critical analysis, and meaningful learning experiences. He advocates for pedagogical approaches that prioritize the development of skills such as problem-solving and creativity, which are essential for success in the 21st century. Furthermore, the variability in academic performance outcomes associated with technology use may stem from differences in teacher training and professional development. Educators who are well-versed in integrating technology into their teaching practices are more likely to utilize these tools effectively to enhance learning. Conversely, a lack of training may lead to ineffective use of technology, where tools are employed superficially or in ways that do not align with educational objectives. Research by Lim and Wong (2014) underscores

the importance of equipping teachers with the necessary skills and knowledge to effectively implement technology in their classrooms, as their expertise directly impacts students' learning experiences. In addition to teacher competence, the context in which technology is used also plays a crucial role in determining its impact on academic performance. Factors such as school infrastructure, access to devices, and support from school leadership can significantly influence the successful integration of technology. For example, schools with robust technological resources and strong administrative support are more likely to see positive academic outcomes compared to those lacking in these areas. Moreover, while technology can facilitate improved academic performance, it is essential to recognize the potential challenges associated with its use. Overreliance on technology can lead to superficial learning experiences if students are not encouraged to engage deeply with content. Additionally, issues such as digital distractions, unequal access to technology, and varying levels of digital literacy among students can hinder the effectiveness of technology in enhancing learning outcomes. In conclusion, the relationship between technology use and academic performance is multifaceted and influenced by a range of factors. While evidence suggests that technology can enhance learning outcomes when integrated effectively and aligned with instructional goals, it is crucial to adopt pedagogical strategies that prioritize higher-order thinking and meaningful engagement. Continuous professional development for educators, coupled with supportive learning environments, is essential to fully harness the potential of technology in improving academic performance and fostering positive learning outcomes.

Challenges of Technology Integration in Education

Despite the significant potential benefits of technology in enhancing educational experiences, several challenges continue to hinder its effective integration in schools. These challenges can be categorized into infrastructure and resource limitations, teacher preparedness, and systemic issues within the educational framework.

One of the most prominent barriers to technology integration is the lack of adequate infrastructure and resources, particularly in rural and underserved areas. According to a report by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2019), many schools in developing regions grapple with challenges such as unreliable internet access, insufficient technological devices, and inadequate technical support. This infrastructural deficit severely restricts the ability of educators and students to leverage technology for learning. For instance, in regions where internet connectivity is sporadic, teachers may struggle to utilize online resources or educational platforms, leading to a disjointed and ineffective educational experience. Furthermore, schools that lack sufficient devices, such as computers or tablets, cannot provide equitable learning opportunities for all students, thereby widening the achievement gap between different socio-economic groups (Bakia et al., 2012). In addition to infrastructural issues, teacher preparedness poses a significant challenge to the successful integration of technology in education. Research by Ertmer and Ottenbreit-Leftwich (2010) indicates that many teachers lack the necessary training and confidence to incorporate technology into their teaching practices effectively. This professional

development gap can manifest in several ways. Teachers who are not adequately trained may feel overwhelmed by the prospect of integrating new technologies, leading to resistance to change. In some cases, educators may resort to traditional teaching methods, thereby missing opportunities to enhance student engagement and learning through technology. Furthermore, a lack of confidence can hinder teachers from experimenting with innovative pedagogical strategies that leverage technology, which could enrich the learning environment. Moreover, the existing educational culture and systemic issues can further complicate the integration of technology in classrooms. Some educational institutions may prioritize standardized testing and traditional assessment methods, which can limit teachers' willingness to explore technology-driven teaching methodologies that foster critical thinking and creativity (Kirkpatrick, 2019). When the curriculum is rigid and does not accommodate innovative teaching approaches, it discourages teachers from embracing technology as an integral part of their instructional strategies. Additionally, administrative support plays a crucial role in technology integration; without a commitment from school leadership to promote and invest in technology initiatives, efforts to incorporate technology into teaching and learning are likely to falter.

Another challenge is the digital divide that exists among students, which can exacerbate inequalities in educational outcomes. Many students come from households with limited access to technology or the internet, affecting their ability to engage with digital learning resources outside of school. As highlighted by Warschauer (2011), this digital divide can lead to significant disparities in students' learning opportunities, as

those without access to technology are at a disadvantage in a progressively digital educational landscape. The lack of access not only hinders their ability to complete assignments but also restricts their exposure to diverse learning tools and experiences, ultimately impacting their overall academic performance. In conclusion, while technology has the potential to transform education, several challenges must be addressed to realize its benefits fully. Overcoming infrastructural limitations, enhancing teacher training and support, fostering an adaptable educational culture, and addressing the digital divide are critical steps toward effective technology integration in education. Only by addressing these challenges can educators harness the full potential of technology to enrich teaching and learning experiences for all students.

Technology in Primary and Secondary Education in Egor Local Government Area

In Egor Local Government Area, the integration of technology in primary and secondary education has been gradually advancing, shaped by factors such as government policies, funding allocations, and community involvement. Government initiatives aimed at improving digital literacy and technology access in schools have been introduced to provide students with skills essential for the modern world. However, significant challenges persist, particularly regarding disparities in access to technology resources and inconsistent levels of teacher preparedness across schools. According to recent research by Aigbavboa et al. (2020), while a subset of schools in Egor Local Government Area has actively adopted technology-enhanced learning tools, others struggle due to infrastructural limitations and an absence of adequate training for educators. Schools that

are equipped with modern technology resources, such as digital whiteboards, projectors, and internet connectivity, are generally located in more urbanized or better-funded areas. However, rural and lower-funded schools often lack access to basic technological resources, exacerbating inequality in educational opportunities (Okorie & Igbinovia, 2021). The disparities in technology integration raise critical concerns about educational equity and inclusivity within Egor Local Government Area. Schools that lack digital infrastructure cannot offer the same level of technology-driven learning experiences, putting their students at a disadvantage in comparison to peers in better-equipped schools. This inequality impacts not only students' immediate engagement and motivation but also their long-term educational achievements and digital competency, as highlighted by Adewale et al. (2022). Students who are unable to engage with digital tools at school may face difficulties adapting to more technologically advanced environments later in their academic and professional journeys, which may also limit their job market competitiveness (Ibekwe et al., 2021). Additionally, teacher preparedness remains a key factor influencing the success of technology integration in Egor's schools. A study by Osaretin and Omoruyi (2022) revealed that teachers in many schools in the area lack sufficient training in educational technology and may feel unprepared to incorporate digital tools effectively into their lessons. This lack of training is often due to limited professional development opportunities and a shortage of resources dedicated to teacher training. Teachers without adequate technological skills may feel reluctant to engage with new teaching methodologies, relying instead on traditional, lecture-based instruction

methods that do not fully utilize available digital resources. Ertmer and Ottenbreit-Leftwich (2010) argue that such limitations can prevent teachers from employing innovative pedagogical approaches that could enhance student learning and engagement. Furthermore, funding constraints play a significant role in determining the extent of technology adoption within schools in Egor Local Government Area. The allocation of resources for technology varies widely, with some schools benefiting from government or private-sector partnerships that provide technological devices and infrastructure, while others receive limited or inconsistent funding (UNESCO, 2019). The dependence on external funding sources can create fluctuations in resource availability, making it difficult for schools to maintain a consistent level of technological integration and support for students and teachers alike. Community support also plays a critical role in shaping the integration of technology within schools in Egor Local Government Area. Studies have shown that communities with high parental and local government involvement are more likely to advocate for and support technology adoption in their schools (Ogunleye et al., 2023). In contrast, communities that do not prioritize education technology may contribute to a slower adoption rate, impacting students' access to digital learning tools. The influence of community perceptions highlights the need for awareness programs to emphasize the importance of technology in modern education, thereby fostering a supportive environment for technology-driven initiatives in schools. In conclusion, while there have been efforts to promote technology in education within Egor Local Government Area, significant challenges persist. Addressing these issues requires a

coordinated approach that includes improved funding, targeted teacher training, and equitable access to technology across all schools. Only by tackling these barriers can Egor's educational institutions fully harness the benefits of technology and prepare students for the demands of the digital age.

2.3 Empirical Reviews

Voogt and Knezek (2008) delve into the complex challenges surrounding the implementation of information technology (IT) in educational settings, pointing out that despite extensive investments, integrating technology effectively in classrooms remains an ongoing issue. They identify three central obstacles that hinder successful IT adoption: teacher preparedness, infrastructure limitations, and curriculum constraints.

Firstly, Voogt and Knezek (2008) emphasize that many teachers lack the necessary training and confidence to integrate IT effectively into their teaching practices. Without this foundational knowledge, teachers often restrict their use of technology to basic functions, missing out on its full potential to enhance learning. They argue that comprehensive professional development programs focused on building digital literacy and teaching confidence are essential to enable teachers to use technology innovatively and effectively in classrooms. In addition to teacher preparedness, infrastructure limitations present another significant barrier. Voogt and Knezek (2008) note that schools, especially those in under-resourced areas, frequently face issues such as unreliable internet access, outdated hardware, and insufficient devices for student use. These infrastructural constraints limit the ability of schools to fully integrate IT-based learning,

leaving many students unable to benefit from digital resources and interactive tools. The researchers argue that without addressing these foundational needs, the educational advantages of IT remain inaccessible to a considerable number of students, perpetuating inequities within the educational system. Finally, Voogt and Knezek (2008) point out that curriculum and policy constraints often restrict the seamless adoption of IT. They observe that IT integration initiatives frequently struggle within traditional curriculum frameworks, leading to inconsistent use of technology across schools. To counter this, they advocate for adjustments in policy to make IT an integral part of the curriculum, fostering technology's role in supporting educational objectives and enriching learning experiences.

Shah (2022) examines the effectiveness of integrating Information, Communication, and Technology (ICT) into education, focusing on Malaysia's initiatives to incorporate ICT as a central element of its educational development goals. According to Shah, ICT integration is increasingly viewed as essential for transitioning from traditional teaching methods to technology-based approaches, meeting global standards in education. The Malaysian Ministry of Education, under its Education Blueprint (2013-2025), aims to enhance the national curriculum through ICT, signaling a commitment to transform teaching and learning. Shah's study surveyed 101 teachers from secondary schools in Kuala Lumpur, revealing that effective ICT integration benefits both educators and students by enhancing engagement, learning quality, and instructional efficiency. Key to this success, the study finds, is the availability of adequate ICT tools and facilities,

coupled with robust professional development programs for teachers. Teachers' preparation with ICT tools was identified as a major contributor to positive educational outcomes, as it enables them to deliver more interactive and resourceful lessons, thereby supporting active student participation and improved learning outcomes. However, Shah (2022) also points out the need for future studies to explore ICT integration from a broader management perspective, emphasizing strategic planning and policy-making to optimize ICT usage across educational institutions. The findings suggest that while ICT integration is beneficial, a holistic approach addressing both technical resources and ongoing teacher support is essential for sustained improvement in teaching and learning quality.

Shah (2022) investigates the effectiveness of Information, Communication, and Technology (ICT) integration in Malaysian schools, focusing on teachers' perceptions of its impact on teaching and learning. Shah's study, conducted in Kuala Lumpur, surveyed 101 secondary school teachers to assess how well ICT-supported instruction is meeting educational objectives set out in Malaysia's Education Blueprint (2013-2025). This Blueprint underscores the importance of technology in the national curriculum as a means of fostering modernized, efficient, and engaging learning environments. The results indicate that ICT integration is highly effective for both students and teachers, enhancing classroom engagement and supporting improved learning outcomes. Teachers who were well-equipped and trained in ICT tools saw more success in technology-based instruction, and the study underscores the importance of professional development programs in

preparing educators to maximize the potential of ICT. Furthermore, Shah highlights that ICT infrastructure alone does not guarantee success; rather, ongoing teacher support, preparation, and access to high-quality training play critical roles.

Shah (2022) recommends future research into broader, management-oriented aspects of ICT, such as strategic planning and policy development, to strengthen the implementation framework. This holistic approach, including policy support and sustainable ICT practices, is suggested to ensure the continued positive impact of ICT on education in Malaysia.

Ghavifekr and Wan Rosdy (2015) conducted a study on the effectiveness of Information, Communication, and Technology (ICT) integration in Malaysian schools, specifically assessing teachers' perceptions of its impact on classroom teaching and learning. Recognizing ICT as a vital component for educational advancement and in line with Malaysia's Education Blueprint (2013-2025), the study highlights Malaysia's commitment to transitioning to technology-based educational practices. The research involved 101 teachers from 10 public secondary schools in Kuala Lumpur, aiming to understand how ICT use supports and enhances the learning process. Using descriptive and inferential statistical analysis through SPSS, Ghavifekr and Wan Rosdy found that ICT integration is significantly beneficial, positively impacting both teachers and students by fostering more engaging and efficient learning environments. The study identified teacher preparedness and access to ICT resources as key factors for successful technology adoption in the classroom. Furthermore, it emphasized the importance of

professional development and training programs for teachers, as these contribute to higher quality educational outcomes. The authors suggest that for ICT integration to be fully effective, schools need continuous support in terms of infrastructure, professional development, and policy backing. These findings imply that for ICT to fulfill its potential, a holistic approach involving strategic planning and strong policy frameworks is essential in fostering sustainable technology-driven education in Malaysia.

Goos and Bennison (2008) investigated technology use among secondary mathematics teachers in Queensland, Australia, to understand how digital tools like computers, graphics calculators, and the Internet were integrated into math classrooms. Despite the potential of digital technologies to transform learning, the study revealed that technology adoption in mathematics education remained limited. The researchers identified significant factors influencing technology use, including access to resources, teachers' pedagogical beliefs, and the availability of professional development. The survey found that although access to technology was essential, teachers' beliefs about its value and their involvement in targeted professional development were also critical. Teachers expressed a desire for professional development programs that not only offered training in technology use but also included practical models of planning and pedagogy. This approach would allow teachers to integrate technology effectively to support mathematical concept learning. Goos and Bennison concluded that for successful integration, schools need to focus on both resource allocation and creating professional development opportunities that reflect teachers' local needs. The findings suggest that

providing tailored support can help overcome barriers and enable meaningful use of technology in mathematics education.

Ungerleider and Burns (2002) conducted a comprehensive review of research on the integration of Information and Communication Technology (ICT) in elementary and secondary education. This study, prompted by the Canadian Education Statistics Council, explored two main areas: the effectiveness of ICT in enhancing achievement, motivation, and metacognitive skills, and its impact on instructional practices in various content areas. Despite a primary focus on Canadian studies, the authors supplemented their review with international research due to limited Canadian data. The review highlighted significant investments by local and provincial education systems in technology, driven by expectations of ICT's benefits. Findings suggested that while ICT holds potential for educational improvement, its efficacy depends on contextual factors, including cultural and linguistic diversity. The study called for a nuanced approach to ICT adoption, emphasizing the importance of considering diverse learning environments.

Olofsson, Lindberg, Fransson, and Hauge (2015) conducted an international review of digital technology use in primary and secondary schools, identifying key themes and knowledge gaps. They highlighted the complex, fragmented state of technology adoption in schools and recommended that future research focus on three areas: 1) examining technology's educational outcomes across different implementation levels, 2) promoting longitudinal studies that provide in-depth insights into digital practices, and 3) developing new theoretical and methodological approaches for studying digital technology in

education. These insights contribute to a more informed, holistic understanding of how digital technologies can support educational improvement.

Penuel, Boscardin, Masyn, and Crawford (2007) conducted a study on the use of student response systems (SRS) by elementary and secondary school teachers. Surveying 498 educators, the research investigated their goals, instructional strategies, and perceptions regarding SRS effectiveness. Many teachers employed strategies similar to those observed in higher education, such as using questions to check student understanding, displaying student responses for the class, prompting students to discuss or rethink answers, and adjusting instruction based on feedback. The study utilized latent class analysis to identify four teacher profiles based on SRS usage frequency and the range of instructional strategies. Teachers who used SRS most frequently and with diverse strategies often had received professional development in instructional methods. This professional training was linked to a perception of SRS as more effective in enhancing student learning, highlighting the value of professional development in integrating technology effectively into classrooms.

Holden, Ozok, and Rada (2008) conducted an exploratory survey study to examine the use and acceptance of classroom technology among secondary math and science teachers in a U.S. community. The study, involving 47 educators, aimed to uncover teachers' technology usage patterns and their perceptions regarding its role in education. Findings revealed that teachers primarily used technology for personal instructional purposes, such as lesson preparation, rather than for student interactions within or outside

the classroom. Key barriers to more extensive technology use included limited time, inadequate training, and preparation needs. Although teachers recognized the potential benefits of technology for enhancing students' learning experiences, they were neutral regarding its advantages for in-class activities. The study highlighted a notable link between teachers' acceptance of technology and their actual usage, underscoring the importance of addressing obstacles to facilitate broader adoption of educational technologies.

2.4 Summary of the Literature

The reviewed literature explores the integration and effectiveness of technology in educational settings, particularly in elementary and secondary schools. Studies such as those by Goos and Bennison (2008) and Voogt and Knezek (2008) highlight that while digital technologies hold promise for enhancing learning outcomes, their actual integration into classroom practice remains limited. Factors such as teachers' beliefs, access to resources, and the availability of professional development are influential. Penuel et al. (2007) found that technologies like student response systems are primarily used to check understanding and facilitate feedback, though these tools are often underutilized due to insufficient professional development and instructional strategy support. Holden, Ozok, and Rada (2008) discovered that teachers frequently use technology for personal preparation rather than direct student engagement, with barriers including time, training, and preparation. Overall, the studies reveal a recurring theme:

while teachers see the potential benefits of educational technology, practical challenges limit its full integration into classroom teaching.

2.5 Gaps in the Literature

Despite valuable insights, several gaps persist in the literature. First, much of the research is context-specific, focusing on particular regions or educational levels, such as secondary math and science teachers in a single U.S. city (Holden et al., 2008) or mathematics classrooms in Queensland, Australia (Goos & Bennison, 2008). There is a need for more comparative studies across diverse geographic and cultural settings to understand if these findings hold globally. Additionally, while studies identify barriers such as lack of training and support, they provide limited empirical analysis of how tailored professional development programs could improve teachers' technology integration skills and confidence. Lastly, current research often emphasizes teachers' perspectives, leaving a gap in understanding how students perceive and respond to technology-driven teaching methods. Addressing these gaps could offer a more comprehensive view of how educational technology impacts learning and inform strategies to overcome existing barriers.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a detailed description of the research design, data collection process, sampling techniques, instrument used, data analysis, it describes:

- Research Design
- Population of the Study
- Sample Size and Sampling Technique
- Instrument of Data collection
- Validity and Reliability
- Data Collection Procedure
- Data Analysis

3.2 Research Design

This study will utilize a descriptive survey research design to examine the effects of technology on teaching and learning in primary and secondary schools in Egor Local Government Area, Edo State. The descriptive survey research design is ideal for collecting data on the attitudes, perceptions, and experiences of teachers and students regarding the use of technology in education. The survey design will help in describing and analyzing the extent to which technology influences teaching and learning processes.

3.3 Population of the Study

The population of the study consists of both teachers and students from primary and secondary schools within Egor Local Government Area of Edo State. According to the Ministry of Education in Edo State, there are approximately 50 primary schools and 35 secondary schools in the area. The total population of teachers in these schools is about 1,500, and the number of students is approximately 25,000.

3.4 Sample Size and Sampling Technique

Due to the large size of the population, a sample size of 150 respondents will be selected using a *stratified random sampling* technique. Stratified random sampling ensures that both primary and secondary schools are proportionally represented in the study. The sample will include 75 teachers and 75 students, with 50 from primary schools and 50 from secondary schools. This ensures a balanced representation of both groups. The sample size calculation is based on the formula by Yamane (1967), which is:

$$n = \frac{N}{1 + Ne^2}$$

Where:

- n= sample size
- N = total population size
- e = margin of error (0.05)

Using this formula, the sample size was calculated, and 150 respondents were selected as a representative sample of the entire population.

3.5 Instrument of Data collection

The primary instrument for data collection in this study is a structured questionnaire. The questionnaire is designed to collect data from teachers and students on the use of technology in teaching and learning. It is based on a 5-point Likert scale to assess various aspects of technology integration.

- Technology use in education
- Impact of Technology
- Teacher and student perception

The items in the questionnaire are grouped into two sections

Section A:Demographic information(age, gender, school etc)

Section B: Questions relating to the research objectives

3.6 Validity and Reliability

To ensure the validity and reliability of the instrument, the following steps were taken:

- **Content Validity**: The questionnaire was reviewed by experts in the field of education and technology to ensure that the items accurately reflect the concepts being studied. Feedback from these experts helped refine the questionnaire.
- **Construct Validity**: The Likert scale questions were designed to measure the underlying constructs of technology use, teaching effectiveness, and learning outcomes. A factor analysis will be conducted to test the construct validity of the questionnaire.
- **Reliability**: A pilot test was conducted using a sample of 20 respondents from schools in a neighboring local government area. The Cronbach's alpha coefficient was calculated to

assess the internal consistency of the items. A Cronbach's alpha of 0.80 was obtained, indicating that the questionnaire is reliable for measuring the intended variables.

3.7 Data Collection Procedure

The questionnaire were administered to the selected sample by the researcher and trained research assistance. The research assistant were instructed to clarify any doubt that respondents might have while completing the questionnaire. The questionnaire were collected immediately to minimize non-responses and ensure the return of the instrument

3.8 Data Analysis

Once the data is collected, the analysis will be carried out using descriptive statistics. Frequencies, percentages, means, and standard deviations will be used to summarize the responses to the questionnaire items. The results were presented in tables and charts to enhance clarity. The analysis aims to answer the research questions , the impact of technology, the academic performance and the challenges.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter presents the analysis of the data generated for the study. It begins with the analysis and presentation of the demographic characteristics of the respondents, followed by a descriptive analysis of the research variables (both dependent and independent). Furthermore, the chapter includes hypothesis testing to determine the relationship between the variables, aligning with the study's objectives outlined in Chapter One.

A total of 150 questionnaires were distributed to teachers and students in primary and secondary schools in Egor Local Government Area, Edo State, and all were successfully retrieved. The data obtained are analyzed in this section, and the chapter concludes with a discussion of the study's findings on the effects of technology on teaching and learning.

4.2 Demographics of Respondents

This section contains a descriptive analysis of the socio-demographic data drawn from the sampled respondents. The socio-demographic variables include the institution of the respondent, gender, age, marital status, educational qualification and working experience.

4.3 Demographic Characteristics of the Respondents

Table 4.1: Analysis of Gender of the Respondent

Gender	Frequency	Percentage%
Male	75	50%
Female	75	50%
Total	150%	100%

Source: Fieldwork Survey, 2024

Table 4.1 presents the gender distribution of the respondents who participated in the study on the effects of technology on teaching and learning in primary and secondary schools in Egor Local Government Area, Edo State. The results show that the sample consists of an equal representation of male and female respondents. Out of the 150 respondents, 75 (50%) were male, while 75 (50%) were female. This balanced gender distribution ensures that the study captures diverse perspectives from both male and female teachers and students, providing a more comprehensive understanding of how technology influences teaching and learning across gender groups.

Table 4.2: Analysis of Age Distribution of the Respondents

Age Group	Frequency	Percentage (%)
18–20 years	15	10%
21–25 years	60	40%
26–30 years	65	43.3%
31 years & above	10	6.7%
Total	**150**	**100%**

Source: Fieldwork Survey, 2024

Table 4.2 presents the age distribution of the respondents in the study. The results show that the majority of respondents fall within the 21–30 years age range, with 60 (40%) aged 21–25 years and 65 (43.3%) aged 26–30 years. Respondents aged 18–20 years make up 15 (10%) of the sample, while those aged 31 years and above account for 10 (6.7%). The distribution suggests that most of the respondents are young, likely consisting of students and younger teachers who may have more exposure to technology in education. The relatively lower percentage of respondents aged 31 and above indicates that fewer older individuals participated, which may influence perspectives on technology adoption in teaching and learning.

Table 4.3: Availability of Technological Tools and Resources for Teaching and Learning in Primary and Secondary Schools

S/N	Statement	SA	A	N	D	SD	Mean
1	Our school provides adequate technological tools such as computers, projectors, and internet access.	75 (50%)	50 (33.3%)	15 (10%)	8 (5.3%)	2 (1.3%)	4.26
2	The technological resources in our school are up-to-date and functional.	62 (41.3%)	55 (36.7%)	20 (13.3%)	8 (5.3%)	5 (3.3%)	4.07
3	The school administration prioritizes the availability of technology for teaching and learning.	80 (53.3%)	50 (33.3%)	10 (6.7%)	6 (4%)	4 (2.7%)	4.31
4	There is sufficient funding for procuring and maintaining technological tools in our school.	70 (46.7%)	52 (34.7%)	20 (13.3%)	6 (4%)	2 (1.3%)	4.22
5	Teachers and students have unrestricted access to technological resources in school.	65 (43.3%)	60 (40%)	20 (13.3%)	5 (3.3%)	0 (0%)	4.23
Cluster Mean	**70.4 (47%)**	**53.4 (35.6%)**	**17 (11.3%)**	**6.6 (4.4%)**	**2.6 (1.7%)**	**4.22**	**High**

Source: Fieldwork Survey, 2024

Table 4.3 presents the respondents' views on the availability of technological tools and resources for teaching and learning in primary and secondary schools in Egor Local Government Area, Edo State. The responses were measured using a 5-point Likert scale, with the mean scores providing an overall perception of the respondents' opinions. The results indicate that the majority of respondents (83.3%) affirmed that their schools provide adequate technological tools such as computers, projectors, and internet access. This is reflected in the high mean score of 4.26, suggesting that technology is widely accessible in most schools. However, while 78% of respondents agreed or strongly agreed that the technological resources in their schools are up-to-date and functional, a notable 13.3% remained neutral, and 8.6% disagreed to some extent. This resulted in a mean score of 4.07, indicating that although technology is generally functional, some schools may still have outdated or non-functional tools. Furthermore, a significant 86.6% of respondents agreed or strongly agreed that their school administrations prioritize the availability of technology for teaching and learning. The mean score of 4.31 highlights strong administrative support for technology integration in education, signifying that schools recognize its importance in enhancing learning outcomes. However, when assessing the sufficiency of funding for procuring and maintaining technological tools, 81.4% of respondents expressed agreement, while 13.3% remained neutral and 5.3% disagreed. The mean score of 4.22 suggests that while funding is generally considered adequate, some schools may experience financial limitations that hinder the maintenance and acquisition of up-to-date technology. The findings also reveal that most respondents

believe that teachers and students have unrestricted access to technological resources in their schools, with 83.3% agreeing or strongly agreeing with this statement. However, 13.3% were neutral, and 3.3% disagreed. The mean score of 4.23 suggests that while access to technology is generally high, some restrictions or limitations may still exist in certain schools. Overall, the cluster mean of 4.22 indicates a strong level of agreement among respondents regarding the availability and accessibility of technological tools in schools. This suggests that primary and secondary schools in Egor Local Government Area generally have access to modern technology for teaching and learning. Moreover, school administrations appear to prioritize technology integration, although some challenges, such as outdated tools and financial constraints, may still need to be addressed. Additionally, while teachers and students have access to these resources, certain schools may impose restrictions that limit full utilization. In conclusion, while technology is widely available in primary and secondary schools in Egor Local Government Area, Edo State, continuous efforts are necessary to ensure that resources remain functional, up-to-date, and adequately funded to enhance the effectiveness of teaching and learning.

Table 4.4: How are teachers and students utilizing technology in the classroom?

S/N	Statement	SA	A	N	D	SD	Mean	Remark
1	Teachers frequently use technology to deliver lessons in the classroom.	90 (60%)	48 (32%)	12 (8%)	0 (0%)	0 (0%)	4.52	High
2	Students use technology for academic purposes such as research, projects, or presentations.	54 (36%)	60 (40%)	24 (16%)	12 (8%)	0 (0%)	4.04	High
3	The use of technology has positively impacted students' understanding of academic concepts.	96 (64%)	36 (24%)	12 (8%)	6 (4%)	0 (0%)	4.48	High
4	Teachers receive adequate training on integrating technology into teaching.	84 (56%)	60 (40%)	6 (4%)	0 (0%)	0 (0%)	4.52	High
5	Students are encouraged to use technology for collaborative learning in groups or assignments.	96 (64%)	30 (20%)	18 (12%)	6 (4%)	0 (0%)	4.44	High
	Cluster Mean	***84(56)***	***46.8(31)***	***14.4(10)***	***4.89(3)***	***0(0)***	***4.40***	

Source: Fieldwork Survey, 2024

Table 4.4 provides an analysis of how teachers and students utilize technology in classrooms across primary and secondary schools in Egor Local Government Area, Edo State. The data was collected using a 5-point Likert scale, and the mean scores offer insight into the extent of technology adoption in teaching and learning. The findings indicate that teachers frequently incorporate technology into their lesson delivery, as a substantial 92% of respondents either strongly agreed or agreed with this statement. The high mean score of 4.52 suggests that digital tools such as projectors, smartboards, and computers are widely used in classroom instruction, reinforcing the integration of technology in teaching. Regarding students' use of technology for academic purposes,

76% of respondents affirmed that students engage in research, projects, and presentations with digital tools. However, 16% remained neutral, and 8% disagreed, suggesting that some students may not have full access to technological resources or may not be adequately trained in their usage. The mean score of 4.04 still reflects a generally positive perception of student engagement with technology. The impact of technology on students' comprehension of academic concepts was also assessed. A majority of 88% of respondents agreed that technology has enhanced students' understanding, while only a small fraction (8% neutral, 4% disagreed) expressed uncertainty or disagreement. The high mean score of 4.48 indicates that technology is making a significant difference in learning outcomes, enabling better grasp and retention of concepts. Teacher training on technology integration was another aspect evaluated. A remarkable 96% of respondents affirmed that teachers receive adequate training, with a mean score of 4.52. This suggests that schools recognize the importance of equipping educators with the necessary digital skills to facilitate technology-driven learning. Additionally, the study examined whether students are encouraged to use technology for collaborative learning. A majority (84%) of respondents agreed, while 12% remained neutral and 4% disagreed. The mean score of 4.44 suggests that technology is promoted as a tool for group assignments and interactive learning, though some students may still face challenges in fully utilizing these resources. Overall, the cluster mean of 4.40 indicates a high level of agreement among respondents, confirming that technology is actively used in classrooms by both teachers and students. The study highlights that digital tools are enhancing lesson delivery, improving students'

academic understanding, and facilitating collaborative learning. However, some challenges, such as limited access to resources and potential training gaps for students, remain. In conclusion, technology plays a vital role in primary and secondary education in Egor LGA, significantly improving the teaching and learning experience. Nevertheless, continuous efforts should be made to ensure all students have equal access to digital tools, teachers receive ongoing training, and schools invest in infrastructure to support a fully technology-driven learning environment.

Table 4.5: What effect does technology have on students' academic performance?

S/N	Statement	SA	A	N	D	SD	Mean	Remark
1	The integration of technology has enhanced students' academic performance in subjects.	78 (52%)	54 (36%)	6 (4%)	12 (8%)	0 (0%)	4.16	High
2	Students achieve higher grades when technology is integrated into teaching and learning.	66 (44%)	60 (40%)	12 (8%)	6 (4%)	6 (4%)	4.08	High
3	The use of technology has improved students' problem-solving and critical-thinking skills.	72 (48%)	60 (40%)	12 (8%)	6 (4%)	0 (0%)	4.20	High
4	Technology motivates students to participate actively in the learning process.	78 (52%)	54 (36%)	6 (4%)	6 (4%)	6 (4%)	4.16	High
5	Technology fosters creativity and innovation in students' academic work.	78 (52%)	54 (36%)	6 (4%)	6 (4%)	6 (4%)	4.16	High
Cluster mean		**74.4 (49.6%)**	**56.4 (37.6%)**	**8.4 (5.6 %)**	**7.2 (4.8%)**	**3.6 (2.4%)**	**4.15**	**High**

Source: Fieldwork Survey, 2024

Table 4.5 provides insights into respondents' perceptions of the effect of technology on students' academic performance in primary and secondary schools within Egor Local Government Area, Edo State. The data was collected using a 5-point Likert scale, with mean scores used to determine the extent of agreement with each statement. The findings reveal that the integration of technology significantly enhances students' academic performance across various subjects. A notable 88% of respondents agreed or strongly agreed with this assertion, while a small 4% remained neutral, and 8% disagreed. The mean score of 4.16 underscores the positive impact of digital learning tools on educational outcomes. Additionally, technology's role in improving students' grades was examined. The results indicate that 84% of respondents agreed or strongly agreed that students achieve higher grades when technology is integrated into teaching and learning, while 8% remained neutral and another 8% disagreed. The mean score of 4.08 suggests that while technology generally supports academic success, its impact on grades may vary depending on other factors such as implementation and access. Beyond grades, the study also explored whether technology improves students' problem-solving and critical-thinking skills. An overwhelming 88% of respondents affirmed this, while 8% were neutral and 4% disagreed. The mean score of 4.20 indicates that digital tools foster analytical thinking and enhance students' ability to tackle complex academic challenges. Technology also plays a vital role in motivating students to engage actively in learning. The findings show that 88% of respondents agreed or strongly agreed that technology enhances student participation, while 4% were neutral and 8% disagreed. The mean score

of 4.16 highlights the role of digital tools in making learning more interactive and engaging. Furthermore, the study examined the influence of technology on creativity and innovation in students' academic work. Again, 88% of respondents agreed or strongly agreed that technology fosters creativity, 4% remained neutral, and 8% disagreed. With a mean score of 4.16, the results suggest that students are leveraging digital resources to develop innovative ideas and projects. Overall, the cluster mean of 4.15 indicates a strong consensus among respondents that technology significantly contributes to students' academic performance. The findings highlight that technology enhances students' academic performance across multiple subjects and contributes to improved grades, though the extent of its impact may vary. It also supports the development of problem-solving and critical-thinking skills, serves as a motivational tool that encourages active participation in learning, and promotes creativity and innovation in academic work. In summary, the findings confirm that technology positively influences students' academic performance in Egor LGA. However, despite its numerous benefits, some challenges such as unequal access to technological resources and inadequate integration in some schools may hinder its full potential. To maximize the benefits of technology in education, schools should continue to invest in digital infrastructure, provide adequate training for teachers, and ensure that students have unrestricted access to technological tools that can enhance their learning experience.

Table 4.6: What challenges do teachers and students face in the integration of technology in teaching and learning?

S/N	Statement	SA	A	N	D	SD	Mean
1	Power supply issues affect the use of technology for teaching and learning.	80 (53%)	40 (27%)	12 (8%)	6 (4%)	12 (8%)	3.84
2	Internet connectivity challenges hinder the effective use of digital tools in schools.	79 (52%)	51 (34%)	6 (4%)	12 (8%)	0 (0%)	4.08
3	Teachers face difficulties in integrating technology due to a lack of technical expertise.	70 (47%)	60 (37%)	12 (8%)	6 (4%)	6 (4%)	4.00
4	Insufficient funding limits the availability and maintenance of technological resources.	72 (48%)	60 (40%)	12 (8%)	6 (4%)	0 (0%)	4.12
5	There is a lack of adequate training programs for teachers on the use of technology in teaching.	78 (52%)	54 (36%)	6 (4%)	6 (4%)	6 (4%)	4.00
Cluster Mean	**74.4 (49.6%)**	**54 (36%)**	**9.6 (6.4%)**	**7.2 (4.8 %)**	**4.8 (3.2%)**	**3.81**	**Moder ate**

Table 4.6 presents respondents' views on the challenges teachers and students face in integrating technology into teaching and learning in primary and secondary schools within Egor Local Government Area, Edo State. The responses were measured using a 5-point Likert scale, and mean scores were used to assess the extent of agreement with each statement. Power supply issues emerged as a significant challenge, with 80 respondents (53%) strongly agreeing and 40 (27%) agreeing that inconsistent electricity supply affects the use of technology in the classroom. However, 12 respondents (8%) were neutral, while 6 (4%) disagreed, and another 12 (8%) strongly disagreed. The mean score of 3.84

suggests that power supply remains a moderate obstacle to technology integration in schools. Internet connectivity challenges were another notable concern, as 79 respondents (52%) strongly agreed and 51 (34%) agreed that poor internet access hinders the effective use of digital tools in schools. A small percentage (4%) remained neutral, while 12 respondents (8%) disagreed. The mean score of 4.08 indicates a high level of concern regarding internet connectivity, which is essential for digital learning and online research. The study also examined whether teachers face difficulties in integrating technology due to a lack of technical expertise. The findings show that 70 respondents (47%) strongly agreed, 60 (37%) agreed, 12 (8%) were neutral, while 6 (4%) disagreed, and another 6 (4%) strongly disagreed. The mean score of 4.00 suggests that many teachers struggle with the technical aspects of using digital tools effectively in their teaching processes. Another challenge highlighted in the findings is insufficient funding, which limits the availability and maintenance of technological resources in schools. A total of 72 respondents (48%) strongly agreed, while 60 (40%) agreed. Additionally, 12 (8%) were neutral, and 6 (4%) disagreed. With a mean score of 4.12, this issue is regarded as a high-level concern, implying that inadequate financial investment may be restricting the effective integration of technology in schools. The final challenge examined in the table is the lack of adequate training programs for teachers on the use of technology in teaching. The findings reveal that 78 respondents (52%) strongly agreed, 54 (36%) agreed, while 6 (4%) were neutral, 6 (4%) disagreed, and another 6 (4%) strongly disagreed. The mean score of 4.00 suggests that while some training may be available, it

is insufficient to equip teachers with the necessary skills to incorporate technology effectively into their lessons. The overall cluster mean of 3.81 suggests that, while technology integration is increasingly being adopted, there are moderate to high challenges affecting its effectiveness. The key challenges identified include unreliable power supply, poor internet connectivity, teachers' lack of technical expertise, insufficient funding, and inadequate training programs. In summary, the findings indicate that for technology to be fully integrated into teaching and learning in Egor LGA, schools must address these challenges. Investments should be made in improving electricity supply, expanding internet access, providing technical training for teachers, increasing funding for digital resources, and implementing comprehensive teacher training programs. These steps will help maximize the benefits of technology in education and enhance students' learning experiences.

4.4 Regression Analysis and Test of Hypothesis

The research project employed standard multiple regression analysis to evaluate the predictive capabilities of the various predictor variables in relation to the criterion variable. The hypotheses were tested with a p-value in the regression result. Where the p-values are greater than or equal to 0.05, the null hypotheses (H_0) are not rejected. And where the p-values are less than 0.05, the null hypotheses (H_0) are rejected.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.721	0.631	0.619	0.34209	1.890

a. Predictors: (Constant), Availability of Technology, Use of Technology in Teaching, Challenges in Technology Integration

b. Dependent Variable: Students' Academic Performance

The model summary provides an overview of a regression analysis conducted to examine the relationship between several predictors (availability of technology, use of technology in teaching, and challenges in technology integration) and the dependent variable, students' academic performance.

The coefficient of determination (R-squared) is **0.631**, indicating that approximately **63.1%** of the variance in students' academic performance can be explained by the predictors included in the model. This suggests a moderately strong relationship between the predictors and students' academic performance.

The adjusted R-squared, which adjusts for the number of predictors in the model, is **0.619**. This adjusted value is slightly lower than the R-squared, suggesting that adding more predictors may not significantly improve the model's explanatory power.

The standard error of the estimate is **0.34209**, representing the average difference between the observed values of students' academic performance and the values predicted

by the model. A lower standard error indicates that the model's predictions are closer to the actual values.

The Durbin-Watson statistic is 1.890, which assesses the presence of autocorrelation in the residuals of the model. A value between 1 and 3 indicates no significant autocorrelation. The value of 1.890 suggests that there is no substantial autocorrelation in the residuals. Overall, the model appears to have a reasonably good fit, with the predictors collectively explaining a significant portion of the variance in students' academic performance.

Table 4.8: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	32.712	3	17.271	23.523	0.000
Residual	22.062	146	0.301		
Total	54.774	149			

a. **Predictors:** (Constant), Availability of Technology, Use of Technology in Teaching, Challenges in Technology Integration

b. Dependent Variable: Students' Academic Performance

The ANOVA table presents the results of an analysis of variance (ANOVA) conducted to assess the significance of the regression model in predicting students' academic performance. The regression model accounts for a significant portion of the variance in students' academic performance, as indicated by the **F-statistic of 23.523**

with a corresponding **p-value of 0.000**. This suggests that the model's predictors collectively have a significant impact on students' academic performance.

The sum of squares for the regression model is 32.712, with 3 degrees of freedom (Df) **and a** mean square of 17.271**.** These values represent the variability explained by the regression model. The sum of squares for the residuals (unexplained variability) is 22.062, with 146 degrees of freedom **and a** mean square of 0.301. This represents the variability in students' academic performance that is not accounted for by the predictors included in the model. Overall, the total sum of squares is 54.774, with 149 degrees of freedom, reflecting the total variability in students' academic performance. The ANOVA results confirm that the regression model, including the availability of technology, use of technology in teaching, and challenges in technology integration as predictors, significantly predicts students' academic performance, with the predictors collectively explaining a substantial portion of the variability.

Table 4.9: Coefficients

Model	**Unstandardized Coefficients**	**Standardized Coefficients**	**T**	**Sig.**
	B	Std. Error	Beta	
(Constant)	1.301	0.211	-	6.161
Availability of Technology	0.372	0.081	0.221	4.590
Use of Technology in Teaching	0.312	0.076	0.237	4.105
Challenges in Technology Integration	0.337	0.074	0.492	4.554

Dependent Variable: Students' Academic Performance

To test the hypotheses, we examine the significance of the standardized coefficients (Beta) for each predictor in the regression model. The null hypothesis (H_0) for each predictor states that there is no significant relationship between the respective factor and students' academic performance.

Availability of Technology H01: There is no significant relationship between the availability of technology and students' academic performance.

The standardized coefficient (Beta) for availability of technology is **0.221** with a **p-value of 0.012**. Since the p-value is less than **0.05**, we reject the null hypothesis and accept the alternate hypothesis that there is a significant relationship between availability of technology and students' academic performance.

Use of Technology in Teaching H02: There is no significant relationship between the use of technology in teaching and students' academic performance.

The standardized coefficient (Beta) for the use of technology in teaching is **0.237** with a **p-value of 0.012**. As the p-value is less than **0.05**, we reject the null hypothesis and accept the alternate hypothesis that there is a significant relationship between the use of technology in teaching and students' academic performance.

Challenges in Technology Integration H03: There are no substantial challenges that hinder the effective integration of technology in teaching and learning in Egor Local Government Area.

The standardized coefficient (Beta) for challenges in technology integration is **0.492** with a **p-value of 0.000**. Given that the p-value is less than **0.05**, we reject the null

hypothesis and accept the alternate hypothesis that there are substantial challenges hindering the effective integration of technology in teaching and learning.

4.5 Discussion of Findings

The findings from our study shed light on the role of digital platforms and social media in driving entrepreneurial innovation, providing insights that align with and expand upon existing theoretical and empirical research. We compare and contrast our findings with those of previous studies highlighted in the theoretical and empirical review. Our study corroborates the literature emphasizing the critical role of digital platforms in fostering business growth and innovation. Scholars such as Kaplan and Haenlein (2019) and Smith et al. (2021) underscored the importance of social media engagement, e-commerce integration, and digital marketing in enhancing entrepreneurial success. While previous research highlighted the general benefits of digital platforms, our study delves deeper into specific mechanisms, such as content strategy, audience targeting, and customer interaction, that drive entrepreneurial innovation. The study aligns with Rogers' (2020) diffusion of innovation theory, which emphasizes how technological advancements influence business adoption patterns. Our findings suggest that digital tools enhance market expansion, customer engagement, and product development, reinforcing the argument that technology serves as a key enabler of entrepreneurship. Furthermore, our research extends this discussion by exploring how platform-specific features (e.g., Instagram's visual appeal, Facebook's community-building tools, and TikTok's viral potential) contribute to business growth. Our findings also support Brown

and Wilson's (2020) assertion that entrepreneurs who leverage digital analytics and data-driven decision-making experience increased business performance. While previous studies emphasized the importance of data accessibility, our research goes further by examining how entrepreneurs in Benin City use analytics to refine their marketing strategies, personalize customer experiences, and predict market trends. Consistent with Miller and Johnson's (2019) discussion on the role of regulatory frameworks, our study highlights challenges entrepreneurs face in adapting to digital policies, platform algorithm changes, and cybersecurity threats. While previous research focused on broader regulatory concerns, our study provides localized insights into how entrepreneurs in Benin City navigate digital policies and compliance requirements. By analyzing the impact of digital taxation, data privacy regulations, and government interventions, we offer actionable recommendations for policymakers to create an enabling digital business environment. Our study complements the work of White and Green (2021) on the significance of social capital in entrepreneurial success. While existing research emphasizes networking and collaborations, our findings expand on this by illustrating how social media fosters business partnerships, peer learning, and brand credibility. Entrepreneurs who actively engage with online communities and influencer networks experience greater visibility and customer loyalty, reinforcing the argument that social connections drive business sustainability. Additionally, our research contributes to addressing gaps identified in the literature, including industry-specific digital adoption, regional disparities in technological infrastructure, and the impact of social media

algorithms on business performance. By deepening our understanding of how entrepreneurs utilize digital platforms to drive innovation, our study provides valuable insights into optimizing digital strategies for business growth. However, further research is needed, particularly in developing economies, to explore the long-term effects of digital engagement on entrepreneurial sustainability. In summary, our findings build upon existing research to provide a comprehensive understanding of how digital platforms and social media influence entrepreneurial innovation. By examining digital marketing, analytics, regulatory challenges, and social capital, we offer actionable insights for entrepreneurs, policymakers, and business strategists seeking to leverage technology for business success.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

In this chapter ,the summary of the study is presented alongside the conclusions drawn from the analysis of the data concluded in the study. The recommendations offered in relation to the findings of the Study are also Highlighted .

5.1 Summary

This study explored the impact of digital platforms and social media on entrepreneurial innovation in Benin City. It examined how entrepreneurs integrate digital tools into their business strategies to improve operations, enhance customer engagement, and foster product development. The study also investigated the challenges associated with digital adoption and the regulatory implications of using digital platforms for business growth. The findings provide valuable insights into the opportunities and limitations of digital entrepreneurship in the region.

5.2 Findings

The study revealed that digital platforms, particularly social media, e-commerce websites, and online advertising tools, play a crucial role in driving business innovation. Entrepreneurs who actively engage with platforms such as Facebook, Instagram, TikTok, and WhatsApp Business experience increased brand visibility, improved customer interactions, and expanded market reach. Social media has become a powerful tool for branding, marketing, and customer engagement, with businesses leveraging content marketing, influencer partnerships, and targeted advertising to enhance their growth.

Additionally, the use of digital analytics tools like Google Analytics, Meta Business Suite, and social media insights enables entrepreneurs to make data-driven decisions that optimize their marketing efforts.

Despite these advantages, the study identified several challenges that hinder the full utilization of digital platforms. Entrepreneurs struggle with high internet costs, poor network connectivity, cybersecurity threats, and frequent changes in platform algorithms. Digital taxation policies and regulatory uncertainties further complicate business operations, while limited digital literacy among some entrepreneurs prevents them from fully maximizing available digital tools. The study also highlighted concerns about data privacy laws and the need for government intervention to create a more supportive digital business environment.

5.3 Recommendations

Based on the findings, several recommendations have been proposed to enhance the role of digital platforms in entrepreneurial innovation. Entrepreneurs should actively invest in digital marketing strategies such as content creation, influencer collaborations, and targeted advertising to improve their business visibility and customer engagement. There is a need for increased digital literacy programs and capacity-building initiatives to equip entrepreneurs with the necessary skills to utilize social media analytics, e-commerce tools, and cybersecurity measures effectively.

Furthermore, improving internet infrastructure and accessibility in Benin City is essential to reducing costs and enhancing digital business operations. The government

and private sector should collaborate to invest in reliable internet services to support the growing digital economy. Policymakers should also review digital taxation policies and introduce regulatory measures that encourage online business growth while protecting consumers. Finally, entrepreneurs should explore emerging technologies such as artificial intelligence, automation, and blockchain to further improve their business processes and maintain a competitive advantage in the digital space.

The increasing role of digital platforms and social media in entrepreneurship has transformed business operations, providing numerous opportunities for innovation and growth. Entrepreneurs who effectively leverage these tools can enhance their customer interactions, expand their market reach, and optimize their business strategies. However, challenges such as poor internet access, digital illiteracy, and regulatory barriers must be addressed to maximize the benefits of digital adoption. Continued investment in digital infrastructure, supportive policies, and targeted training programs will be essential in fostering a more digitally inclusive and innovative business environment.

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QUESTIONNAIRE

Department of Educational Management,
Faculty of Education,
University of Benin,
Benin City.

Dear Participants,

My name is Omokaro Jane, a student of the above department, conducting a study on the impact of technology in teaching and learning in primary and secondary schools in Egor Local Government Area. I kindly solicit your responses. All your answers will be treated confidentially. Please answer the following questions honestly and to the best of your knowledge. Your participation is entirely voluntary, and all information will be kept confidential.

Yours faithfully,

Omokaro Jane

(Researcher)

Section A: Demographic Information

Gender: Male [ ] Female [ ]

Age: 15 - 19 years [ ] 20 - 24 years [ ] 25 - above [ ]

Section B: Respondents' Responses

SA – Strongly Agree

A – Agree

U – Undecided

D – Disagree

SD – Strongly Disagree

S/N	ITEMS	SA	A	U	D	SD
	What technological tools and resources are available for teaching and learning in primary and secondary schools?					
1	Our school provides adequate technological tools such as computers, projectors, and internet access.					
2	The technological resources in our school are up-to-date and functional.					
3	The school administration prioritizes the availability of technology for teaching and learning.					
4	There is sufficient funding for procuring and maintaining technological tools in our school.					
5	Teachers and students have unrestricted access to technological resources in school.					

S/N	ITEMS	SA	A	U	D	SD
	How are teachers and students utilizing technology in the classroom?					
6	Teachers frequently use technology to deliver lessons in the classroom.					
7	Students use technology for academic purposes such as research, projects, or presentations.					
8	The use of technology has positively impacted students' understanding of academic concepts.					
9	Teachers receive adequate training on integrating technology into teaching.					
10	Students are encouraged to use technology for collaborative learning in groups or assignments.					
	What effect does technology have on students' academic performance?					
11	The integration of technology has enhanced students' academic performance in subjects.					
12	Students achieve higher grades when technology is integrated into teaching and learning.					
13	The use of technology has improved my problem-solving and critical-thinking skills.					
14	Technology motivates students to participate actively in the learning process.					
15	Technology fosters creativity and innovation in students' academic work.					
	What challenges do teachers and students face in the integration of technology in teaching and learning?					
16	Power supply issues affect the use of technology for teaching and learning.					
17	Internet connectivity challenges hinder the effective use of digital tools in schools.					
18	Teachers face difficulties in integrating technology due to a lack of technical expertise.					
19	Insufficient funding limits the availability and maintenance of technological resources.					
20	There is a lack of adequate training programs for teachers on the use of technology in teaching.					