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RESEARCH ARTICLE

The Contribution of Educational Technologies on Students' Academic Achievement in Public Secondary Schools in Nyamagana District, Mwanza-Tanzania

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ABSTRACT

This paper intends to assess the contribution of educational technologies to students' academic achievement in public secondary schools in Nyamagana District, Mwanza-Tanzania. This study was guided by the Theory of Technological Pedagogical Content Knowledge (TPACK) which was established by Matthew Koehler and Punya Mishra in 2006. This study employed the mixed research approach and a convergent parallel design. The study used a sample size of 84 teachers, 98 students, 4 heads of schools and 1 DEO. Moreover, stratified and simple random sampling was used to select teachers and students and purposive sampling was used to get heads of schools and DEO. Data was collected through questionnaires and interviews. Validity was ensured through face and content validity checks, while reliability was assessed using Cronbach's alpha achieving a correlation coefficient of 0.7. The results show that the adoption rate of educational technologies in public secondary schools in Nyamagana District is steadily increasing, driven by administrative support and positive perceptions from both teachers and students regarding technology's impact on learning outcomes. However, challenges such as insufficient training and inconsistent technological infrastructure persist, indicating areas needing improvement. The study reveals a significant upward trend in the adoption of educational technologies, emphasising the need for targeted enhancements in training and resources to ensure equitable access for all educators and students. It was recommended that policymakers prioritise comprehensive professional development for teachers and invest in reliable infrastructure to support effective technology integration in schools.

Keywords: Educational technologies; students; academic achievement; pedagogies

INTRODUCTION

Technology significantly impacts educational practices and mass communication, facilitating a paradigm shift in teaching and learning (Asbari et al., 2020). While many educators recognize the potential benefits of digital tools, such as online courses, virtual classrooms, and interactive technologies (Kiong, 2022), the actual improvements in student outcomes, particularly in

under-resourced areas, remain uncertain (Sintema, 2020). Trends in educational technology, driven by advancements like AI and adaptive technologies, offer greater flexibility and personalization in learning experiences (Wang & Sun, 2021). AI is increasingly used to tailor education and streamline assessment processes (Yuan & Lu, 2020), while VR and AR enhance engagement in subjects like science and

history (Zhang et al., 2019). Overall, the integration of technology in education aims to create personalized learning experiences and prepare students for a digital future (Li et al., 2020).

The integration of digital technologies in education is rapidly evolving in both France and Germany, reflecting a broader recognition of their potential to enhance teaching and learning. In France, the Ministry of Education (2020) reports an increasing use of interactive whiteboards, digital textbooks, and online platforms in public secondary schools, supported by studies from the University of Paris (2019) and the French National Centre for Scientific Research (2018), which highlight the adoption of educational apps and virtual reality to create more engaging learning experiences in subjects like history and science (Violić-Koprivec & Tolj, 2022). The COVID-19 pandemic has further accelerated this trend, prompting a shift towards remote and hybrid learning models that emphasize innovative teaching methods (Courtney et al., 2022). Meanwhile, in Germany, teachers are similarly incorporating online resources, learning management systems, and adaptive learning platforms to support personalized learning and address individual student needs (DIPF, 2021; LfBi, 2020). Moreover, the emphasis on digital literacy and media education is growing, with educators integrating skills such as information literacy and online safety into the curriculum to prepare students for a digitally interconnected world (Azzahra et al., 2021). These trends underscore a concerted effort in both countries to leverage technology for improved educational outcomes and to equip students with the necessary skills for the digital age.

Adekunle (2016) explored the use of mobile learning devices in Nigerian secondary schools and found that they were being used to provide students with access to educational content and resources outside of the school environment. This trend highlights the recognition of the potential of mobile devices to support personalized learning, improve student motivation and engagement, and extend learning beyond the confines of the classroom. The reasons behind these trends in Nigeria are likely influenced by several factors. Firstly, there is a growing awareness of the potential benefits of technology in enhancing teaching and learning experiences. Technology can provide access to a wide range of educational resources, facilitate communication and collaboration, and support personalized learning (Demir & Akpınar, 2018).

The integration of ICT in public secondary schools in Kenya and Tanzania illustrates a significant trend towards enhancing educational methodologies through technology. In Kenya, the Kenya Institute of Curriculum Development (2020) highlights the increasing adoption of digital learning resources and mobile devices, such as smartphones and tablets, which facilitate interactive learning and improve access to educational content. This shift is driven by the desire to create engaging learning experiences that enhance teaching outcomes. Similarly, studies in Tanzania by Raphael (2019) underscore the potential of online learning platforms and digital resources to foster personalized learning, engage students, and support collaborative activities. These trends reflect a broader recognition of the importance of technology in education, aiming to bridge the digital divide and provide students with flexible learning opportunities.

In Nyamagana district, the influence of educational technology on public secondary schools is a pressing concern. Despite the growing recognition of the benefits of technology in education, many schools in this district still face challenges in applying digital tools and resources. For instance, a recent study found that only 20% of public secondary schools in Nyamagana district have access to computers, and even fewer have reliable internet connectivity (Tanzania National Bureau of Statistics, 2020). This limited access to technology hinders the ability of teachers to effectively integrate digital resources into their lesson plans, leaving students without the opportunities to develop essential digital literacy skills and potentially falling behind their peers in urban areas with better access to technology. Therefore, this gap raises the researcher's interest in conducting such a study. Thus, the study was carried out concerning the contribution of educational technologies to students' academic achievement in public secondary schools in Nyamagana District, Mwanza, Tanzania.

Objective of the Study

To assess the contribution of educational technologies on students' academic achievement in public secondary schools in Nyamagana district, Mwanza-Tanzania

THEORITICAL REVIEW

This study was guided by the Theory of Technological Pedagogical Content Knowledge (TPACK) which was established by Matthew Koehler and Punya Mishra in 2006. The theory addresses the critical need for teachers to effectively integrate technology into their

teaching practices by emphasizing the interconnectedness of technology, pedagogy, and content knowledge. TPACK serves as a flexible framework for teacher education and professional development, guiding educators in designing technology-enhanced instructional strategies that promote student engagement and achievement. However, critics argue that TPACK lacks clarity and can be challenging to apply consistently, potentially overemphasizing technology while neglecting other crucial factors like pedagogy and student needs. This study utilizes the TPACK framework to evaluate how teachers in public secondary schools integrate these three domains in their instruction, aiming to provide insights into current educational technology practices and identify areas for improvement to better support effective teaching in the digital age.

EMPIRICAL REVIEW

The integration of technology in education has become increasingly prevalent in recent years, with many schools and institutions incorporating various educational technologies into their teaching practices. The adoption rate of these technologies has been a topic of interest among researchers, as understanding how and why educators choose to incorporate these tools can provide valuable insights into their effectiveness and potential impact on students' learning outcomes.

In Canada, a study by Tan et al. (2019) explored the factors influencing the adoption of mobile learning technologies among educators in Canadian universities. The researchers found that perceived usefulness, ease of use, and compatibility with the curriculum were significant factors that influenced educators' decisions to adopt mobile learning technologies in their teaching practices. Another study by Mozellus and Seijmer (2018) examined the adoption of digital assessment tools in Canadian higher education institutions. The researchers found that educators were more likely to adopt digital assessment tools if they perceived them to be easy to use, beneficial for student learning, and aligned with their teaching goals. Additionally, institutional support and resources were key factors that influenced educators' decisions to adopt these technologies. In a study by Scherer and Siddiqui (2017), the adoption of online learning technologies in Canadian K-12 schools was investigated. The researchers found that educators were more likely to adopt online learning technologies if

they received adequate training and support, believed in the effectiveness of the technologies, and saw positive outcomes in student engagement and achievement. Overall, these studies suggest that the adoption rate of educational technologies in Canada is influenced by a combination of factors, including perceived usefulness, ease of use, compatibility with the curriculum, institutional support, and training opportunities. Educators are more likely to adopt technologies that align with their teaching goals, enhance student learning outcomes, and have the necessary support and resources to integrate them effectively.

Moreover, French National Centre for Educational Research (2020) looked at the adoption of online learning platforms in French schools. The study found that 68% of schools in France have access to online learning platforms, but only 42% of teachers reported using them regularly in their teaching. The study also found that teachers who did use online learning platforms reported positive outcomes, such as increased student engagement and improved learning outcomes. This indicates that there is value in incorporating online learning platforms into teaching practices, but that more support and training may be needed to encourage wider adoption. A study conducted by the French Institute for Research in Education (2019) found that the use of educational apps in French schools is on the rise. The study found that 64% of teachers reported using educational apps in their teaching and that 76% of students reported enjoying using apps for learning. The study also found that teachers who used educational apps reported benefits such as increased student motivation and improved understanding of complex concepts. This suggests that educational apps have the potential to enhance the learning experience for students and may be worth further exploration in French schools. This implies that there is still room for improvement. While infrastructure such as internet access and interactive whiteboards is widely available, there is a need for more support and training for teachers to effectively integrate technology into their teaching practices. Studies have shown that when used effectively, educational technologies can enhance the learning experience for students and improve learning outcomes. Moving forward, it will be important for schools and educators in France to continue investing in technology and providing the necessary support for teachers to fully leverage its potential in the classroom.

Likewise, Wang et al. (2018) focused on the adoption rate of online learning platforms in Chinese universities. The study found that while online learning platforms were widely available and used by students, there were significant variations in adoption rates across different disciplines and institutions. Factors such as institutional support, perceived usefulness, and ease of use were found to influence the adoption of online learning platforms among students. Overall, the adoption rate of educational technologies in China appears to be relatively high, with teachers and students alike embracing digital tools and resources in educational settings. However, there are still challenges and barriers that need to be addressed to further enhance the integration of technology in education. By providing adequate training and support, addressing concerns about the impact of technology on teaching methods, and improving the usability of online learning platforms, the adoption rate of educational technologies in China can be further increased.

The adoption rate of educational technologies in Ghana has been the focus of various studies in recent years. These studies have sought to understand the extent to which technology is being integrated into classrooms and how it is impacting teaching and learning. In a study conducted by Agyei and Voogt (2011), it was found that the adoption rate of educational technologies in Ghana was relatively low compared to other countries. The study highlighted the lack of access to technology and inadequate training for teachers as major barriers to adoption. Another study by Nyarko and Bolli (2015) explored the factors influencing the adoption of educational technologies in Ghana. The researchers found that factors such as infrastructure, funding, and support from stakeholders played a significant role in determining the adoption rate. The study also highlighted the importance of teacher training and professional development in facilitating the integration of technology in classrooms.

The adoption rate of educational technologies in Kenya has been a topic of interest for researchers and policymakers as they seek to understand how technology is being utilized in the education sector. One study conducted by Njoroge et al. (2018) investigated the use of educational technologies in Kenyan secondary schools. The study found that while there was a high awareness of the potential benefits of technology in education, actual adoption rates were relatively low. Teachers cited various challenges such as lack of training, limited access to technology, and

inadequate infrastructure as barriers to the effective implementation of educational technologies in the classroom. Another study by Kimenyi et al. (2019) focused on the adoption of online learning platforms in Kenyan universities. The researchers found that while there was a growing interest in online learning among students and educators, the adoption rate was still limited. Factors such as cost, technical support, and lack of awareness were identified as key barriers to the widespread adoption of online learning platforms in higher education institutions in Kenya. These studies highlight the complex nature of technology adoption in the education sector in Kenya. While there is recognition of the potential benefits of educational technologies, there are several challenges that need to be addressed to increase adoption rates. Policymakers and stakeholders in the education sector must work together to provide teachers and students with the necessary training and resources to effectively integrate technology into the classroom.

The adoption rate of educational technologies in Tanzania is a topic of growing interest as the country seeks to improve the quality of education and meet the demands of a rapidly changing world. One study conducted by Shubi and Majinge (2019) focused on the factors influencing the adoption of educational technologies in Tanzanian schools. The study found that lack of infrastructure, limited financial resources, and limited technical support were among the key barriers to the adoption of educational technologies. However, the study also identified several factors that could facilitate the adoption of technology, such as government support, teacher training, and integration of technology into the curriculum.

Another study by Msanjila and Majinge (2018) examined the impact of educational technologies on student learning outcomes in Tanzanian schools. The study found that students who had access to educational technologies experienced improved academic performance and higher levels of engagement in learning. However, the study also highlighted the importance of effective teacher training and ongoing support to maximize the benefits of technology in education. Overall, the adoption rate of educational technologies in Tanzania is a complex issue that requires a multi-faceted approach. Investing in infrastructure, providing adequate resources, and offering continuous teacher training are crucial steps to enhance the integration of technology in education. Additionally, policymakers and educators must work

together to develop comprehensive strategies that address the barriers to technology adoption and leverage the potential of educational technologies to improve learning outcomes in Tanzania. The adoption of educational technologies in Tanzania faces significant challenges, including infrastructure deficits and limited financial resources. However, with targeted government support, teacher training, and strategic integration into the curriculum, there is a promising pathway to enhance educational outcomes and student engagement.

METHODOLOGY

This study employed the mixed research approach and a convergent parallel design. The study used a sample size of 84 teachers, 98 students, 4 heads of schools and 1 DEO. Moreover, stratified and simple random sampling was used to select teachers and students and purposive sampling was used to get heads of schools and DEO. Data was collected through questionnaires and interviews allowing for both quantitative and qualitative insights into educational technology practices. Validity was ensured through face and content validity checks, while reliability was assessed using Cronbach's alpha, achieving a correlation coefficient of 0.7. Ethical considerations were prioritized throughout the research process, including obtaining permission from relevant authorities, ensuring informed consent, and maintaining confidentiality for all participants. This comprehensive approach aimed to capture accurate and meaningful data regarding the integration of technology in education.

PRESENTATION AND DISCUSSION OF THE FINDINGS

The adoption rate of educational technologies in public secondary schools in Nyamagana has shown a gradual but significant upward trend in recent years, driven by increasing recognition of the importance of technology in enhancing learning outcomes and improving educational access. Factors such as government initiatives aimed at integrating digital tools into the curriculum, the availability of training programs for educators, and the rising availability of affordable devices have contributed to this progress. Thus, teachers responded to the objective as shown in Table 1.

The table presents the results regarding teachers' perceptions of educational technology integration in the school. Responses are categorized into five options:

Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD).

The first statement reveals strong support for the school administration's encouragement of educational technology use, with 71.3% of respondents strongly agreeing and 26.3% agreeing. This suggests a positive administrative stance, likely fostering an environment conducive to technological adoption in classrooms. However, when it comes to training and support, the responses are more mixed. While 35% strongly agree and 57.5% agree that teachers receive adequate training, 2.5% remain neutral and another 2.5% disagree. This indicates a significant portion of teachers feel they are not sufficiently supported in effectively integrating technology, which could hinder the overall impact of these tools on learning.

Regarding the availability of up-to-date educational technologies, 36.3% strongly agree, and 38.8% agree, but 10% disagree, and 2.5% strongly disagree. This mixed feedback suggests that while many teachers find the technology satisfactory, there is room for improvement in ensuring that resources meet current curricular needs. The responses about planning and preparation time show that 33.8% strongly agree and 47.5% agree that teachers have sufficient resources and time to incorporate technology into lessons. This points to a generally supportive environment, although the 16.3% who remain neutral could reflect varied experiences among teachers. Likewise, Mozelius and Seijmer (2018) found that educators were more likely to adopt digital assessment tools if they perceived them to be easy to use, beneficial for student learning, and aligned with their teaching goals.

Similarly, perceptions of the school infrastructure supporting educational technologies show that 32.5% strongly agree and 47.5% agree, with a small percentage disagreeing. While the majority feel supported, the 20% who are neutral or disagree highlight potential areas for infrastructure enhancement. Confidence in using educational technologies appears relatively high, with 45% strongly agreeing and 42.5% agreeing. However, the presence of neutral and disagreeing responses indicates that some teachers may still feel uncertain or lack experience, which could affect their instructional practices. In line, Scherer and Siddiqui (2017), found that educators were more likely to adopt online learning technologies if they received adequate training and support, believed in the effectiveness of the

technologies, and saw positive outcomes in student engagement and achievement.

Table 1. Teachers responses on adoption rate of educational technologies (n=80)

Statement	SA		A		N		D		SD	
	F	%	F	%	F	%	F	%	F	%
The school administration actively encourages the use of educational technologies in the classroom.	57	71.3	21	26.3	2	2.5	0	0	0	0
Teachers receive adequate training and support to effectively integrate educational technologies into their lessons.	28	35	46	57.5	2	2.5	0	0	2	2.5
The available educational technologies in the school are up-to-date and meet the needs of the curriculum.	29	36.3	31	38.8	10	12.5	8	10	2	2.5
Teachers are provided with sufficient time and resources to plan and prepare lessons that incorporate educational technologies.	27	33.8	38	47.5	13	16.3	2	2.5	0	0
The school infrastructure supports the effective use of educational technologies.	26	32.5	38	47.5	14	17.5	2	2.5	0	0
Teachers are confident in their ability to use educational technologies in the classroom.	36	45	34	42.5	4	5	3	3.8	3	3.8
The use of educational technologies has improved student learning outcomes in my subject area.	47	58.8	21	26.3	2	2.5	4	5	6	7.5

Source: Filed Data (2024)

Lastly, when asked about the impact of educational technologies on student learning outcomes, 58.8% strongly agree and 26.3% agree. This strong positive perception suggests that many teachers believe technology has a beneficial effect on student performance, which is encouraging for ongoing investment in these resources. Overall, while there is a strong endorsement for the administration's support and perceived benefits of educational technologies, the data highlights areas needing attention, particularly in teacher training, resource availability, and infrastructure improvements. Addressing these concerns could enhance the effectiveness of technology integration and ultimately improve educational outcomes. Moreover, students responded to the objective and their responses are presented in Table 2 below.

Table 2 presents survey results reflecting students' perceptions of educational technology use in their learning environment, categorized by response options. A significant majority of students (72.8% strongly agree

and 21.7% agree) feel that using educational technologies enhances their learning experience. This strong positive sentiment suggests that students recognize the benefits of technology in their education, which can motivate continued investment in such resources. When assessing the availability of reliable and fast internet access, 47.8% of students strongly agree, and 35.9% agree that the school provides adequate internet support. While the majority view internet access as satisfactory, the presence of 15.2% who remain neutral indicates that some students may experience inconsistent connectivity, which could impact their ability to utilize educational technologies effectively. The perception of the relevance and currency of educational technologies shows that 51.1% strongly agree, while 20.7% agree that these tools are up-to-date and aligned with the curriculum. However, 21.7% remain neutral, and a small percentage disagree. This highlights a potential area for improvement, as ensuring that technologies are current

and relevant can enhance their effectiveness in supporting students' learning.

Students also expressed positive feelings about the engagement factor, with 64.1% strongly agreeing and 21.7% agreeing that educational technologies make classes more interactive and engaging. This suggests that technology not only aids in learning but also fosters a more dynamic classroom environment. In terms of technical support, 52.2% of students strongly agree, and 37% agree that adequate support is available for addressing issues with educational technologies. This indicates a strong foundation for troubleshooting and maintenance, which is crucial for effective technology integration in classrooms. Regarding the impact of educational technologies on academic performance, half of the respondents (50%) strongly agree, and 35.9% agree that their overall academic performance has improved due to technology use. This correlation between technology and improved academic outcomes reinforces the argument for ongoing investment in educational technologies. Finally, concerning the clarity and helpfulness of the school's policies on technology use, 48.9% strongly agree, and 27.2% agree that the guidelines are effective. However, a combined 23.5% are neutral or disagree, suggesting that while many students find the policies beneficial, there is still room for improvement in communicating these guidelines effectively.

The implications of these findings are important for improving the implementation of educational technologies. The fact that most students feel these tools enhance their learning and engagement suggests that technology has the potential to positively transform the classroom experience. However, the mixed responses regarding infrastructure, support, and relevance to the curriculum highlight areas where improvements are necessary. Schools may need to focus on ensuring consistent and reliable internet access, providing ongoing technical support, and regularly updating technological tools to ensure they align with the curriculum. In addition, French National Centre for Educational Research (2020) add that, there is value in incorporating online learning platforms into teaching practices, but that more support and training may be needed to encourage wider adoption.

Additionally, the small percentage of students who remain neutral or dissatisfied regarding the benefits of educational technology indicates that schools should strive to identify and address the specific barriers faced by these students. This might involve further refining the

selection of technologies, offering personalized support, and improving the training and resources available to both students and teachers. By addressing these issues, schools can maximize the potential of educational technologies to improve academic outcomes and student engagement. Meanwhile, Li, Zhang and Li (2019) added that the majority of teachers use digital tools and resources in their classrooms because educational technologies are relatively high. Nonetheless, there was an interview concerning the adoption rate of educational technologies. The interview was conducted with the head of schools and the DEO. Thus the head of school A responded on the current level of adoption of educational technologies. The head of the school said:

The current level of adoption of educational technologies in our school is quite encouraging, with a majority of teachers using at least one form of digital tools in their classrooms. We have integrated various platforms that facilitate online learning and student engagement. However, there is still variability in the depth of technology usage among different subjects and grade levels. Our goal is to achieve a more uniform integration across the board, ensuring that all learners benefit equally (Interview, August 2024).

This points to a willingness to adopt technology but highlights the need for targeted interventions to support those educators who may be lagging. Similarly, Nyarko and Bolli (2015) show the importance of teacher training and professional development in facilitating the integration of technology in classrooms which include factors such as infrastructure, funding, and support from stakeholders played a significant role in determining the adoption rate. Moreover, during interview sessions another head of school B added:

In our school, we utilize a range of educational technologies, including interactive whiteboards, learning management systems, and student response systems. Many teachers also incorporate educational apps and online resources that tailor learning experiences to individual student needs. Additionally, video conferencing tools have been crucial in engaging with students during remote learning periods. This diverse toolkit helps us cater to different learning styles and fosters a more interactive classroom environment (Interview, August 2024)

The variety of tools suggests that we're fostering a culture of innovation; however, it is essential to ensure that all teachers are equally proficient in using these technologies. As Njoroge et al. (2018) added that there was a high awareness of the potential benefits of technology in education. This implies that while fostering a culture of innovation through various technological tools is promising, it is crucial to provide equitable training and support to all teachers to ensure proficiency and maximize the educational benefits of these technologies. In addition, another head of the school C revealed:

I would rate the overall integration of educational technologies in our instructional practices as moderate to high, with some areas showing exemplary use while others need improvement. Teachers who are more adept at using technology are effectively enhancing their lessons, but there remain pockets of resistance or uncertainty. Our leadership team is committed to providing additional resources and encouragement. Overall, continuous assessment and support are essential to elevate the integration across the board (Interview, August 2024).

Table 2: Students responses on adoption rate of educational technologies (n=92)

Statement	SA		A		N		D		SD	
	F	%	F	%	F	%	F	%	F	%
The use of educational technologies in the classroom helps me learn better	67	72.8	20	21.7	0	0	4	4.3	1	1.1
The school provides reliable and fast internet access to support the use of educational technologies.	44	47.8	33	35.9	14	15.2	1	1.1	0	0
The educational technologies available in the school are up-to-date and relevant to the curriculum.	47	51.1	19	20.7	20	21.7	2	2.2	4	4.3
The use of educational technologies makes classes more engaging and interactive.	59	64.1	20	21.7	7	7.6	3	3.3	3	3.3
The school provides adequate technical support to address any issues with the educational technologies.	48	52.2	34	37	5	5.4	3	3.3	2	2.2
The use of educational technologies has improved my overall academic performance.	46	50	33	35.9	7	7.6	6	6.5	0	0
The school's policies and guidelines regarding the use of educational technologies are clear and helpful	45	48.9	25	27.2	10	10.9	7	7.6	5	5.4

Source: Field Data (2024)

This indicates that while there is a solid foundation for technology integration, focused strategies are necessary to elevate the less engaged educators and ensure holistic development. Meanwhile, the DEO added:

In Nyamagana District, the adoption rate of educational technologies in public secondary schools is around 60%, with a noticeable variation across different schools. Some

schools have made significant strides in integrating technologies such as computers and smart boards, while others are still reliant on traditional methods. Factors like infrastructure availability and access to reliable internet play a major role in these disparities. Our aim is to elevate the overall adoption rate by providing additional resources and support to underperforming schools (DEO, August

2024)

This suggests that while there is a general movement toward adopting educational technologies, ongoing disparities need to be addressed to ensure equitable access across schools in the district. Moreover, Msanjila and Majinge (2018) added that students who had access to educational technologies experienced improved academic performance and higher levels of engagement in learning.

CONCLUSION

The study reveals a significant upward trend in the adoption of educational technologies within public secondary schools in Nyamagana District, indicating a growing recognition of the pivotal role these tools play in enhancing both teaching and learning outcomes. While school administrations are actively promoting the integration of digital resources, the effectiveness of their incorporation varies across different subjects and grade levels. Teacher and student feedback suggests a general satisfaction with the existing institutional support, yet persistent concerns regarding the adequacy of training and technological infrastructure highlight the need for targeted enhancements. The findings underscore the necessity for ongoing evaluations of technology integration practices to ensure that all educators and students can fully benefit from the advancements in educational technology.

RECOMMENDATIONS

Policymakers should prioritize comprehensive professional development for teachers on integrating educational technologies, ensuring ongoing training, mentorship, and improved infrastructure in schools. Investment in reliable hardware and software is essential, alongside initiatives that encourage collaboration and resource sharing among schools. Establishing clear standards for technology integration will help ensure equitable access for all students. School administrators should incorporate feedback from teachers and students to tailor training, allocate time for professional development, and foster a culture of innovation. Additionally, teachers should proactively seek professional development opportunities, collaborate with peers, and engage students in technology use to enhance learning outcomes.

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