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Exploring the Role of Principals in Leveraging Teacher Capacity Building and Enhancement through Collaborative Technology in Nigerian Secondary Schools

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Abstract

As the educational landscape has changed, school principals now have a bigger role in developing teacher capacity and advancing professional development through the strategic integration of collaborative technologies. This study examines how important it is for principals to use digital tools and platforms to encourage resource sharing, teamwork, and the development of vibrant learning communities, among secondary school teachers in Nigeria. The study shows that adopting collaborative technology, offers a workable answer to problems including the lack of access to traditional professional development options and the requirement for ongoing skill building. Principals have the ability to enable teachers to develop their instructional methods, which will ultimately result in better student outcomes, by providing peer learning opportunities, real-time communication, and access to global educational resources. This study also emphasises the significance of leadership in developing a climate of ongoing professional development and the possible influence of collaborative technology on Nigeria's larger educational system. To ensure that Nigerian secondary schools stay competitive and innovative in the global education arena, the study emphasises the necessity for targeted investments in technology infrastructure and professional development programs to support principals and teachers in this digital shift.

Keywords: Collaborative Technology; Teacher Capacity; Professional Development; School Leadership; Nigerian Secondary Schools.

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Introduction

In Nigerian secondary schools, increasing teacher capacity and supporting their professional growth are essential to improving instruction and ensuring student achievement. Since teachers are the main agents of learning, the quality of education that children receive is strongly impacted by their abilities, expertise, and professional development (Hennessy et al., 2022). Buttressing this, Ajani (2018), asserts that one cannot stress the significance of ongoing professional development in the context of Nigerian secondary schools, where issues like scarce resources, disparities in teacher qualifications, and quickly evolving educational expectations are common. Improving teacher capacity and professional development is essential to raising the standard of instruction in secondary schools in Nigeria. Teachers may create more engaging and productive learning environments by using the most recent educational tactics, technologies, and pedagogical approaches that are made available to them through capacity building. This is especially crucial in a nation like Nigeria where learning levels must constantly rise in order to keep up with international norms. By making investments in the ongoing professional development of educators, schools may enhance the quality of instruction, adjust to changes in the field of education, deal with disparities, and eventually guarantee better results for every student.

Globally, integrating technology into education has emerged as a key component of improving the teaching and learning process. The achievement of the best possible educational results is hampered in Nigerian secondary schools by issues like low levels of technology adoption, restricted access to resources, and inadequate teacher preparation (Bada, et al. 2020). By encouraging teacher capacity building and utilising collaborative technologies to enhance instructional practices, principals, in their function as instructional leaders, play a critical role in tackling these issues. According to Akinola (2013), digital resource-sharing platforms, virtual meeting rooms, and online learning platforms are examples of collaborative technology tools that can improve teacher cooperation, professional development, and instructional efficacy. However, the use of these technologies is still uneven in many secondary schools in Nigeria because of things like inadequate infrastructure, a lack of strategic leadership, and a lack of prepared teachers (Umar, 2021). This study contends that by using strategic leadership techniques to successfully incorporate collaborative technology, principals are in a unique position to close these gaps. This study fills a crucial knowledge gap about how Nigerian school principals might use collaborative technology to support teacher development and enhance student learning, which makes it noteworthy. It promotes a paradigm change in school leadership that places an emphasis on collaborative professional development and technology innovation as the main forces behind the transformation of education in secondary schools in Nigeria.

This study aims to explore how Nigerian secondary school principals use collaborative technology to improve professional development and teacher capacity. It also aims to demonstrate how principals can use technology to create a more efficient and cooperative learning environment, which will ultimately improve student results. Specifically, the purpose of this study is to offer insights into how administrators might use technology to support and enhance teacher development and instructional effectiveness by looking at various techniques and also to identify challenges and barriers in technology integration.

The study draws upon the relevance of the Technological Pedagogical Content Knowledge (TPACK) Theory developed by Mishra and Koehler (2006) as the theoretical lens to offer a thorough insight for comprehending and incorporating technology into teaching,

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focusing on the interaction of pedagogy, topic knowledge, and technology. Because it offers an organised method for comprehending how collaborative technology can be successfully incorporated into teachers' professional development practices, the TPACK framework is relevant to this study (Koh et al., 2016). The TPACK framework assists in the following areas by examining how principals might use technology to improve teacher capacity:

1. Helping principals create technology integration plans that complement topic understanding and pedagogical approaches, guaranteeing that technology use is efficient and purposeful.
2. Highlighting how crucial it is to give teachers professional development that tackles the interaction of pedagogy, material, and technology so they may use it to improve their subject-matter expertise and teaching methods.
3. Pointing out the shortcomings and difficulties in the way technology is now integrated, such as a mismatch in technological expertise or pedagogical mismatch, and offering a solution framework.
4. Assisting educators improve their awareness of how technology might support cooperative learning, encouraging the exchange of best practices and cooperative problem-solving

Conceptual Overview

1. Collaborative Technology

A variety of digital tools and platforms that let people collaborate virtually, regardless of where they are physically located, are referred to as collaborative technology (Kipkosgei et al., 2020). These technologies offer shared areas where users may connect asynchronously or in real time, facilitating coordination, communication, and cooperation on activities or projects. Conversely, digital platforms and applications known as collaborative technology tools in education are made to help students, teachers, and other learning process stakeholders communicate, collaborate, and interact with one another (Hauge & Norenes 2014). With the help of these tools, users may collaborate in real time or asynchronously, share materials, and add to collective knowledge, which improves learning and creates a more dynamic and interesting learning environment. A few examples of collaborative technological tools utilised in the classroom are:

1. Users can send and receive instant messages, share files, and have real-time or structured chat conversations using communication technologies like Slack, Microsoft Teams, and WhatsApp (Cansoy, 2017). Additionally, video conferencing tools like Zoom, Google Meet, and Skype allow for virtual meetings in which attendees can share screens, communicate verbally and nonverbally, and collaborate as though they were in the same space.
2. Cloud storage services like Google Drive, Dropbox, and OneDrive enable users to save documents, spreadsheets, presentations, and other files in the cloud, making them available to all collaborators. This facilitates document and file sharing. Additionally, there is collaborative editing, wherein individuals may edit documents at the same time, view changes in real-time, and offer comments or criticism using technologies like Google Docs and Microsoft 365.
3. Teams can map ideas, brainstorm, and work together in real-time on visual projects using digital whiteboards and brainstorming tools like Miro, Jamboard, and Padlet, which are provided by interactive platforms.

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4. Learning Management Systems (LMS) that facilitate educational collaboration, including Moodle, Blackboard, and Google Classroom, enable teachers and students to work together on assignments, share materials, and have structured classroom discussions.

Applications and Benefits of Collaborative Technology

- Through enhanced communication between students and teachers as well as amongst students themselves, collaborative technological solutions enable clearer and more productive interactions.
- Instantaneous and dynamic input from numerous users is made possible by real-time editing and collaboration tools such as Google Docs and Microsoft Teams.
- Learning becomes more dynamic and engaging when using interactive tools like Flipgrid and Kahoot which encourage active engagement.
- These resources accommodate different learning styles and schedules by supporting both synchronous and asynchronous learning.
- Lesson plans, assignments, and educational resources may be easily shared with others thanks to platforms like Google Drive and SharePoint.
- Features for giving feedback and rating contributions are frequently included in collaborative work tools, which facilitate a more thorough assessment of student achievement.

2. Teacher Capacity Building and Enhancement

According to Liu (2022), building and enhancing teachers' capacity is a constant process that aims to raise their level of expertise, proficiency, and general efficacy in the classroom. It includes a broad range of professional development techniques and activities designed to give educators the instruments and materials they require to provide high-quality instruction and adapt to the changing demands of learners and educational systems. The following are a few elements of teacher capacity building:

1. **Professional Development:** To help teachers stay current on the newest theories, practices, and technology tools in education, regular workshops, seminars, and training sessions are held. Gaining more education through master's degrees, specialised certifications, or professional courses improves a teacher's subject-matter or pedagogical approach knowledge.
2. **Instructional Skills and Pedagogical Practices:** Teachers receive training in techniques including inquiry-based learning, differentiated instruction, and collaborative learning that encourage critical thinking, active learning, and student participation. Building strong classroom management abilities is crucial to fostering a supportive learning environment and reducing disturbances.
3. **Curriculum and Content Knowledge:** Subject matter experts are required to be teachers. Deepening this subject knowledge is a common goal of capacity building initiatives, especially in quickly evolving sectors like science, technology, engineering, and mathematics (STEM). Instructors receive training on how to create, modify, and execute curricula that satisfy the various requirements of their pupils while adhering to the goals and standards of education.
4. **Technological Integration:** Developing teachers' ability to use technology in the classroom effectively is essential, especially as digital tools become more

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and more integrated into the educational process. This covers the use of collaborative technology, internet resources, and instructional software. The ability to create and deliver mixed or entirely online courses is a skill that educators should have, especially in light of the global trend towards remote learning.

5. **Assessment and Evaluation:** Teachers receive training in a variety of evaluation techniques so they can measure student learning efficiently, give feedback, and modify instruction as necessary. Developing the ability to use student data to identify learning gaps, inform teaching practices, and personalise instruction is a key component of capacity building.

Importance of Teacher Capacity Building and Enhancement

1. Improving Student Outcomes: Effective teachers enhance student engagement, learning, and achievement in the classroom by being well-prepared and consistently developing their abilities (Sun et al., 2013). Personalised support and tailored education can be more effectively provided by teachers with expanded capacities to better address the unique requirements of their pupils.

2. Adapting to Educational Changes: Capacity building guarantees that educators can modify their methods to be current and productive even when technology and educational standards change.

3. Promoting Teacher Retention and Job Satisfaction: Continuous professional development and growth ospportunities boost teacher motivation, retention, and satisfaction while lowering turnover rates.

4. Building a Collaborative School Culture: Werimba (2024), states that building capacity among educators, foster a collaborative culture in which they can exchange best practices, assist one another, and raise the standard of education throughout the school. Building capacity helps produce a group of teacher-leaders who can lead constructive changes in the classroom and in the larger educational community by developing their leadership abilities.

Current State of Education in Nigerian Secondary Schools and the Challenges Faced in Teacher Development

There are a lot of problems with the secondary education system in Nigeria right now, especially with teacher development. These difficulties stem from a confluence of historical, socioeconomic, and policy-related elements that have moulded the nation's educational environment:

1. **Quality of Education**: There have been concerns raised about the standard of instruction in several secondary schools in Nigeria. Subpar educational results can be caused by a variety of factors, including a lack of teaching and learning resources, packed classrooms, and poor infrastructure.
2. **Teacher Qualifications and Competency**: A significant obstacle in secondary education in Nigeria is the level of qualification and proficiency of teachers (Bektaş et al., 2020). There are a lot of good and committed teachers in the system, but there are also a lot of gaps in their professional development and training.

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3. **Limited Professional Development Opportunities**: In Nigeria, professional development for educators is frequently insufficient in terms of access and quality. In line with this, Hennessy et al. (2015), stated that many educators lack access to regular, structured professional development opportunities that would enable them to stay current with educational technology breakthroughs, learn new teaching techniques, and upgrade their skill sets.
4. **Policy and Implementation Gaps**: Although there are policies in place to enhance teacher development, there is frequently a lag in the execution of policies. Numerous issues, such as inadequate money, a lack of political will, and inefficiencies in the bureaucracy, can be blamed for this gap.
5. **Economic Constraints**: Nigeria's teacher development and education systems are significantly impacted by economic issues. Karacabey et al. (2020), noted that many schools have tight funds, which limits their capacity to make investments in physical upgrades, educational materials, and teacher preparation.
6. **Technological Integration**: Although technology has the potential to revolutionise both teacher preparation programs and education, its integration into secondary schools in Nigeria is still in its infancy. Buttressing this, (Hauge & Norenes 2014), opined that many schools are not equipped to employ digital tools for teaching and learning because they do not have access to internet and energy.
7. **Socio-cultural Factors**: The sociocultural elements that impact Nigerian education include gender inequalities, geographical variations, and cultural perspectives on education. Access to school can be restricted in certain areas, especially in the northern half of the country, due to cultural customs and security concerns, particularly for girls (Unterhalter et al., 2013). These differences make it difficult to create a cohesive strategy for teacher development and contribute to unequal educational outcomes.
8. **Teacher Motivation and Retention**: Low pay, little opportunities for professional growth, and challenging working conditions are just a few of the issues secondary school teachers in Nigeria must deal with. These issues also lead to low motivation and high turnover rates (Onyekwelu, 2024). It is extremely difficult to retain qualified instructors, especially in impoverished and rural locations where conditions are frequently more difficult.

The Need for Technology Integration in Education in Nigeria

The crucial part that technology plays in revolutionising education has come to be understood more and more in recent years. A number of issues, such as the need to educate students for a digital world that is changing quickly, the potential benefits of technology for teaching and learning, and the general societal movement towards a technology-driven economy, are driving the demand for technology integration:

1. **Preparation for the Digital Economy**: It is imperative that students be given the tools they need to succeed in this new environment as the world economy grows more and more digital. This covers more complex skills like data analysis, coding, and digital problem-solving in addition to fundamental digital literacy. Therefore, there is pressure on schools to incorporate technology into their curricula in order to educate students for the demands of the workforce of the twenty-first century.

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2. **Enhancing Teaching and Learning**: There are several ways that technology can improve the process of teaching and learning. With the use of digital tools, teachers can create individualised learning programs that are tailored to the needs of specific pupils. Additionally, by enabling more dynamic and captivating teaching, educational technology can boost student engagement and motivation. Technology can also make it possible to access a multitude of online materials, broadening the breadth of learning outside of the conventional classroom.
3. **Access to Education**: By giving students in remote or underserved locations access to learning resources and opportunities, technology has the ability to democratise education (Ovcharuk et al., 2019). Virtual classrooms, educational software, and online learning platforms can help students who are spread geographically apart from one another to connect and receive a high-quality education.
4. **Global Competitiveness**: Education systems are being evaluated more and more in a globalised society based on their capacity to turn out pupils who can compete internationally. Successfully integrating technology into educational systems puts a nation in a better position to produce a highly trained labour force that can spur economic growth and innovation (Raman et al., 2019).
5. **Responding to the COVID-19 Pandemic**: The COVID-19 epidemic brought to light how crucial technology is to maintaining schooling in emergency situations. Due to the forced closure of schools worldwide, online learning has taken over as the main form of instruction. This experience hastened the adoption of digital tools and processes and highlighted the necessity of a strong technology infrastructure in education.
6. **Teacher Professional Development**: The need for technology integration in education is growing, and this requirement also affects teacher professional development. To successfully integrate digital tools and platforms into their teaching practices, educators must possess a high level of proficiency in their use (Mulholland & O'Connor 2016).

The Role of Principals in Driving Educational Reforms and Promoting Professional Development

When it comes to determining the course and efficacy of educational reforms in schools, principals are essential. They are in charge of putting policies into action, developing a healthy school climate, and spearheading programs that improve teaching and learning since they are the main leaders of educational establishments. Their guidance is essential to guaranteeing that educational reforms are accepted and successfully incorporated into the classroom in order to produce significant results.

1. **Leadership in Educational Reform**: Leading the front in efforts to change education are principals, who act as a liaison between legislators and educators (de Jong et al., 2021). Within their schools, they have to interpret and put into practice new policies, curricula, and teaching strategies. Principals' guarantee that reforms are implemented in a way that benefits both teachers and students and that they are in line with the school's vision and goals by giving clear guidance and support.
2. **Creating a Vision for Change**: Visionaries who understand when change is necessary and have the ability to clearly express their vision for educational

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reform are excellent principals. They encourage a culture of innovation and continual improvement by inspiring and motivating their employees to adopt novel concepts and methods.

3. **Building Collaborative Cultures**: Creating a collaborative atmosphere in the classroom is one of the principals' main responsibilities when it comes to leading educational reform. Principals inspire teachers to collaborate in enacting changes by encouraging teamwork and shared decision-making. By working together, changes are made that are customised to the particular requirements of the school community and that educators are empowered to participate in the process of change.
4. **Supporting Professional Development**: For educators to improve their teaching methods and adjust to new educational reforms, professional development is crucial. When it comes to encouraging and providing opportunities for continuous professional growth for their employees, principals are essential. This involves giving educators access to materials, training, and workshops so they may learn new skills and stay up to date on the newest innovations in education.
5. **Monitoring and Evaluating Reform Efforts**: It is the duty of principals to oversee the application of educational changes and assess how they affect the performance of their students. Through consistent evaluation of reform projects, administrators can make well-informed judgements regarding necessary modifications and offer teachers focused support.
6. **Advocating for Resources and Support**: Additional finance, technology, and training are frequently needed for educational improvements. Principals look for the resources needed to promote reform initiatives on behalf of their schools. They collaborate with legislators, community leaders, and district executives to obtain the resources and backing required to carry out reforms effectively.
7. **Addressing Challenges and Resistance**: It can be difficult to implement educational reforms; therefore, principals need to be ready to deal with opposition and get over roadblocks. This entails paying attention to worries expressed, giving assurances, and putting forward suggestions to address any possible problems.

The Benefits of Collaborative Technology for Teacher Capacity Building and Professional Development

For the purpose of professional development and capacity building among teachers, collaborative technology has many advantages. These resources not only promote student learning but also help teachers continue to develop and get better. The main advantages are as follows:

1. **Facilitates Continuous Professional Learning;** Teachers can access a multitude of resources through collaborative technology, such as webinars, online courses, and professional learning communities (PLCs). This continuous access facilitates learning and professional growth. Teachers can establish professional partnerships and collaborative learning opportunities beyond their local contexts by connecting with peers, experts, and mentors abroad.
2. **Enhances Collaboration and Sharing of Best Practices;** Teachers can share lesson plans, teaching ideas, and educational resources with colleagues through platforms like Edmodo, Microsoft Teams, and Google Drive. This promotes the

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sharing of best practices among educators. Collaborative projects and campaigns are supported by tools like Trello and Padlet, which let teachers collaborate on research, curriculum creation, and classroom tactics.

3. **Encourages Innovative Teaching Practices;** Nguyen & Ng (2020), stated that collaborative technology motivates educators to incorporate cutting-edge techniques and resources into their classrooms, improving their teaching strategies and raising student interest. With the use of resources like Flipgrid and Padlet, educators can try out novel approaches to learning and teamwork, which encourages creativity and innovation in their work practices.
4. **Provides Flexibility and Accessibility;** With asynchronous learning environments like Moodle and Coursera, educators can participate in professional development activities at their own pace and convenience, meeting the needs of learners with different schedules and obligations. Geographical obstacles can be overcome by instructors collaborating and taking part in professional development activities through the use of collaborative technologies.
5. **Enhances Data-Driven Decision Making;** Data about student performance and the efficacy of instruction may be gathered, shared, and analysed using platforms like Microsoft Excel and Google Sheets, which facilitates data-driven decision-making. Through collaborative platforms, educators may monitor their professional development progress and accomplishments, which helps them remain focused on their growth goals.
6. **Fosters a Supportive Professional Environment;** Collaborative technology makes it easier to establish encouraging professional networks where educators may exchange stories, seek guidance, and get support from one another (Hennessy et al., 2022). Collaboration-promoting platforms facilitate mentorship connections, in which more seasoned teachers assist and coach their less seasoned peers.

Strategies for Principals to Promote and Support the use of Collaborative Technology among Teachers

1. **Establish a Clear Vision and Goals;** define your vision for the use of collaborative technologies to improve instruction. Establish quantifiable metrics precise goals that are in line with the general educational aims of the institution. To foster understanding and support, regularly share the vision and goals with all relevant parties, such as parents, instructors, and students.
2. **Provide Professional Development;** Plan training courses and workshops with a collaborative technological tools focus. In order to accommodate varying levels of proficiency ensure these sessions cover both basic and advanced aspects. Provide teachers with opportunity to collaborate, share best practices, and get peer mentoring so they can learn from one another.
3. **Create a Supportive Environment;** Offer technical assistance to instructors in order to resolve any problems they may have with collaborative technology. Help desks and on-site IT support are examples of this. Set aside time on a regular basis for educators to learn about and utilise collaborative technologies. Examples of this include professional development days or assigned planning sessions.
4. **Promote Collaborative Culture;** Encourage educators to collaborate on projects and to share their experiences through collaborative technologies in order to cultivate a collaborative culture. Establish online communities or forums where educators may

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communicate, exchange resources, and talk about integrating technology into the classroom.

5. **Provide Resources and Tools;** Ensure that every teacher has access to the gadgets and software needed for group projects using technology. Offer a carefully chosen range of technological tools and resources that have been shown to be successful in fostering collaborative teaching and learning.
7. **Monitor and Evaluate;** keep an eye on the use of collaborative technologies in the classroom. Gather information about student outcomes, teacher comments, and usage trends. Assess the efficiency of collaborative technologies in accomplishing learning objectives. Make educated judgements regarding future technology strategy and investments by using this knowledge.
8. **Foster Partnerships;** cultivate a relationship with technology suppliers to remain current on recommended practices and new technologies. Use these alliances to your advantage for assistance and training. Investigate grants, contributions, and other financial options to aid in the purchase and deployment of collaborative technology.

Challenges and Limitations

1. **Limited Access to Technology**; The lack of dependable digital infrastructure in Nigerian secondary schools is one of the biggest obstacles to using collaborative technology for teacher capacity building (Ifinedo et al., 2020). Many schools, particularly those in rural regions, lack the requisite gear, software, and internet connectivity to employ digital tools effectively.
2. **Insufficient Digital Literacy among Teachers**; It's possible that a sizable portion of secondary school teachers in Nigeria lack the digital literacy abilities needed to make successful use of collaborative technologies for professional development (Zimmer & Mathews 2022). This restriction may make it more difficult for teachers to accept and use these tools effectively since they may feel overburdened or reluctant to incorporate new technologies into their everyday work.
3. **Resistance to Change**; The adoption of collaborative technology in educational environments frequently encounters opposition from teachers and school administrators who are habituated to conventional approaches to professional growth. This resistance may result from a failure to recognise the advantages of technology, a fear of taking on more work, or an inability to adjust to new habits and practices.
4. **Inadequate Professional Development Programs**; The success of collaborative technology in augmenting professional development is contingent upon the calibre and pertinence of the professional development programs that are being offered. According to Wordu et al. (2022), there may be a gap between the technology that is accessible and the real needs of educators because many of the current programs are not sufficiently adapted to the unique requirements of teachers in secondary schools in Nigeria.
5. **Financial Constraints;** Collaborative technology adoption in schools necessitates a large initial financial outlay for infrastructure, continuous maintenance, and training. One of the biggest challenges facing many secondary schools in Nigeria according to Saka, (2021), is raising the money needed to invest in modern technology, especially for those in underfunded public systems.
6. **Privacy and Data Security Concerns;** Data collecting and sharing are commonplace while using collaborative technology, which presents privacy and data security problems. Inadequate safeguards for confidential data can result in data breaches

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involving teachers and students, eroding technological confidence and raising moral and legal questions.

7. **Sustainability of Technology Integration;** One major problem is ensuring the viability of collaborative technological ventures over the long term. To keep these instruments effective over time, you need things like consistent funding, continued professional development, and the capacity to adjust to new technology. Initial investments in collaborative technology will not pay off in the long run if there is no clear plan for sustainability.

Successful Technology Integration Led by Principals in Nigerian Secondary Schools

1: Lagos State Technology Initiative: A thorough technology integration program was introduced at many secondary schools in Lagos State (A'mar, 2021). By utilising digital tools and platforms, the program sought to improve teaching and learning. According to Thannimalai & Raman (2018), the initiative was mostly led by the principals who created a clear vision for incorporating technology into the curriculum along with goals and expected results. They arranged for teachers to participate in comprehensive training sessions on the use of digital tools in the classroom and obtained funds to buy interactive whiteboards, projectors, and PCs. Students who participated in this campaign demonstrated higher levels of motivation and engagement in subjects that used technology (Gunter & Reeves (2016). Teachers also worked together more successfully, exchanging resources and best practices via digital channels. There was increased satisfaction with the learning experience expressed by both teachers and students.

2: Ogun State Interactive Learning Platform: In Ogun State, an interactive learning platform was implemented to assist secondary school teachers and pupils (Owolabi et al. (2013). The principals made sure teachers could use the interactive platform efficiently by setting and training sessions, which helped the program succeed. Additionally, they aggressively encouraged teachers and learners to utilise the platform, gathering user input to enhance its operation. Student participation and engagement in classes increased as a result of this interactive platform. Teachers' technology proficiency and teaching methods improved (Darling-Aduana, 2018). A more dynamic and engaging learning environment was produced through the use of interactive tools. These case studies demonstrate how important it is for principals to successfully integrate technology in secondary schools in Nigeria. Principals can significantly improve teaching and learning by setting an example, offering professional development, procuring funding, and encouraging a collaborative culture. Every example shows how strategic planning and strong leadership may lead to improved teacher development and learning results.

Future Directions

1. Future studies should concentrate on the long-term effects of collaborative technology on the performance of schools as a whole, student outcomes, and teacher effectiveness.
2. It might be investigated how AI and data analytics can be used with collaborative technologies to offer teachers individualised professional development opportunities.
3. Create and modify collaborative technological tools that are especially meant to deal with Nigeria's particular educational difficulties. Developing platforms that

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address regional languages, cultural settings, and the unique requirements of secondary schools in Nigeria is part of this.

4. In the future, projects might look into mixed models of professional development, which combine the advantages of online collaborative tools with in-person mentorship and workshops.
5. It should be a governmental goal to incorporate digital literacy and competency into teacher education programs and continuing professional development.

Conclusion

Incorporating collaborative technology into secondary schools in Nigeria offers a noteworthy prospect to improve teacher proficiency and professional growth. For Nigerian secondary schools to be competitive and innovative in the global education scene, they must make the difficult but necessary step of completely integrate collaborative technology into school administration and professional development. In order to make this digital shift successful and long-lasting, stakeholders including governmental agencies, academic institutions, and business partners must collaborate in order to supply the tools, training, and assistance that are required. By doing this, secondary schools in Nigeria would be able to use technology's revolutionary potential to create an education system that is more responsive and effective going forward.

Recommendations

1. Government agencies and partners in the commercial sector must work together to provide the infrastructure required for collaborative technologies.
2. Implement ongoing professional development programs focused on improving the digital literacy of teachers.
3. Provide a specialised support system to help educators who encounter technical difficulties when utilising collaborative technologies.
4. In order to obtain access to resources, knowledge, and cutting-edge tools that can facilitate the integration of collaborative technology, schools should look to form partnerships with technology businesses, non-governmental organisations, and educational institutions.

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References

Ajani, O. A. (2018). Needs for In-service Professional Development of Teachers to Improve Students' Academic Performance in Sub-Saharan Africa. *Arts and Social Sciences Journal*, *09*(02). https://doi.org/10.4172/2151-6200.1000330

Akinola, O. B. (2013). Principals" Leadership Skills and School Effectiveness: The case of South Western Nigeria. *Word Journal of Education* 3(5), 3157 DOI: 10.5430/wje.v3n5p26

A'mar, F., & Eleyan, D. (2022). Effect of Principal's Technology Leadership on Teacher's Technology Integration. *International Journal of Instruction*, *15*(1), 781–798. https://doi.org/10.29333/iji.2022.15145a

Bada, H. A., Ariffin, T. F. T., & Nordin, H. (2020). The Effectiveness of Teachers in Nigerian Secondary Schools: The Role of Instructional Leadership of Principals. *International Journal of Leadership in Education*, *27*(1), 44–71. https://doi.org/10.1080/13603124.2020.1811899

Bektaş, F., Kılınç, A. Ç., & Gümüş, S. (2020). The effects of distri buted leadership on teacher professional learning: mediating roles of teacher trust in principal and teacher motivation. *Educational Studies*, *48*(5), 602–624. https://doi.org/10.1080/03055698.2020.1793301

Cansoy, R. (2017). Teachers' Professional Development: The Case of WhatsApp. *Journal of Education and Learning*, *6*(4), 285–285. https://doi.org/10.5539/jel.v6n4p285

Darling-Aduana, J., & Heinrich, C. J. (2018). The role of teacher capacity and instructional practice in the integration of educational technology for emergent bilingual students. *Computers & Education*, *126*, 417–432. https://doi.org/10.1016/j.compedu.2018.08.002

de Jong, L., Meirink, J., & Admiraal, W. (2022). School-based collaboration as a learning context for teachers: A systematic review. *International Journal of Educational Research*, *112*, 101927–101927. https://doi.org/10.1016/j.ijer.2022.101927

Gunter, G. A., & Reeves, J. L. (2016). Online professional development embedded with mobile learning: An examination of teachers' attitudes, engagement and dispositions. *British Journal of Educational Technology*, *48*(6), 1305–1317. https://doi.org/10.1111/bjet.12490

Hauge, T. E., & Norenes, S. O. (2014). Collaborative leadership development with ICT: experiences from three exemplary schools. *International Journal of Leadership in Education*, *18*(3), 340–364. https://doi.org/10.1080/13603124.2014.963689

Hennessy, S., D'Angelo, S., McIntyre, N., Koomar, S., Kreimeia, A., Cao, L., Brugha, M., & Zubairi, A. (2022). Technology Use for Teacher Professional Development in Low- and Middle-Income Countries: A systematic review. *Computers and Education Open*, *3*, 100080–100080. https://doi.org/10.1016/j.caeo.2022.100080

Hennessy, S., Haßler, B., & Hofmann, R. (2015). Challenges and opportunities for teacher professional development in interactive use of technology in African schools. *Technology Pedagogy and Education*, *24*(5), 1–28. https://doi.org/10.1080/1475939x.2015.1092466

Ifinedo, E., Rikala, J., & Hämäläinen, T. (2020). Factors affecting Nigerian teacher educators' technology integration: Considering characteristics, knowledge constructs, ICT practices and beliefs. *Computers & Education*, *146*, 103760–103760. https://doi.org/10.1016/j.compedu.2019.103760

Karacabey, M. F., Bellibaş, M. Ş., & Adams, D. (2020). Principal leadership and teacher professional learning in Turkish schools: examining the mediating effects of collective teacher efficacy and teacher trust. *Educational Studies*, *48*(2), 253–272. https://doi.org/10.1080/03055698.2020.1749835

Kipkosgei, F., Kang, S., & Choi, S. B. (2020). A Team-Level Study of the Relationship between Knowledge Sharing and Trust in Kenya: Moderating Role of Collaborative Technology. *Sustainability*, *12*(4), 1615–1615. https://doi.org/10.3390/su12041615

Koh, J. H. L., Chai, C. S., & Lim, W. Y. (2016). Teacher Professional Development for TPACK-21CL. *Journal of Educational Computing Research*, *55*(2), 172–196. https://doi.org/10.1177/0735633116656848

Liu, P. (2022). Understanding the roles of expert teacher workshops in building teachers' capacity in Shanghai turnaround primary schools: A Teacher's perspective. *Teaching and Teacher Education*, *110*, 103574–103574. https://doi.org/10.1016/j.tate.2021.103574

Mulholland, M., & O'Connor, U. (2016). Collaborative classroom practice for inclusion: perspectives of classroom teachers and learning support/resource teachers. *International Journal of Inclusive Education*, *20*(10), 1070–1083. https://doi.org/10.1080/13603116.2016.1145266

Nguyen, D., & Ng, D. (2020). Teacher collaboration for change:*sharing, improving, and spreading*. *Professional Development in Education*, *46*(4), 638–651. https://doi.org/10.1080/19415257.2020.1787206

Ewugi, M. S., & Ibrahim, S. (2023). Piloting an innovation for teachers' capacity development in STEM subjects in Nigerian secondary schools. *GSC Advanced Research and Reviews*, *17*(2), 209–220. https://doi.org/10.30574/gscarr.2023.17.2.0427

Onyekwelu, R. A. (2024). Enhancing the Quality of Secondary Education Through Professional Development of Teachers in Nigeria. *British Journal of Multidisciplinary and Advanced Studies*, *5*(1), 194–205. https://doi.org/10.37745/bjmas.2022.0438

Ovcharuk, O. V., Ivaniuk, I., Soroko, N. V., Hrytsenchuk, O. O., & Kravchina, O. Ye. (2020). The use of digital learning tools in the teachers' professional activities to ensure sustainable development and democratization of education in European countries. *E3S Web of Conferences*, *166*, 10019–10019. https://doi.org/10.1051/e3sconf/202016610019

Owolabi, T. O., Oyewole, B. K., & Oke, J. O. (2013). Teacher Education, Information and Communication Technology: Prospects and Challenges of E-Teaching Profession in Nigeria. *Journal of Humanities and Social Sciences*, *1*(2), 87–91. https://doi.org/10.11634/232907811604314

Raman, A., Thannimalai, R., & Ismail, S. N. (2019). Principals' Technology Leadership and its Effect on Teachers' Technology Integration in 21st Century Classrooms. *International Journal of Instruction*, *12*(4), 423–442. https://doi.org/10.29333/iji.2019.12428a

Saka, O. A. (2021). Can Teacher Collaboration Improve Students' Academic Achievement in Junior Secondary Mathematics? *Asian Journal of University Education*, *17*(1), 33–33. https://doi.org/10.24191/ajue.v17i1.8727

Sun, M., Penuel, W. R., Frank, K. A., Gallagher, H. A., & Youngs, P. (2013). Shaping Professional Development to Promote the Diffusion of Instructional Expertise Among Teachers. *Educational Evaluation and Policy Analysis*, *35*(3), 344–369. https://doi.org/10.3102/0162373713482763

Thannimalai, R., & Raman, A. (2018). The Influence of Principals' Technology Leadership and Professional Development on Teachers' Technology Integration in Secondary Schools. *Malaysian Journal of Learning and Instruction*, *15*(1), 201–226. https://doi.org/10.32890/mjli2018.15.1.8

Umar, O. S., Kenayathulla, H. B., & Hoque, K. E. (2021). Principal leadership practices and school effectiveness in Niger State, Nigeria. *South African Journal of Education*, *41*(3), 1–12. https://doi.org/10.15700/saje.v41n3a1859

Unterhalter, E., Heslop, J., & Mamedu, A. (2013). Girls claiming education rights: Reflections on distribution, empowerment and gender justice in Northern Tanzania and Northern Nigeria. *International Journal of Educational Development*, *33*(6), 566–575. https://doi.org/10.1016/j.ijedudev.2013.05.007

Werimba, M. M. (2024). Enhancing educational excellence: An analysis of teacher capacity building and its impact on instructional delivery in public secondary Schools in Kenya. *World Journal of Advanced Research and Reviews*, *21*(3), 995–1002. https://doi.org/10.30574/wjarr.2024.21.3.0268

Wordu, H., Joseph, P. T., & Tariah, C. I. (2022). Technology integration into values education in Nigerian secondary schools. *International Journal of Arts Humanities and Social Studies*, *4*(1), 21–26. https://doi.org/10.33545/26648652.2022.v4.i1a.35

Zimmer, W. K., & Matthews, S. D. (2022). A virtual coaching model of professional development to increase teachers' digital learning competencies. *Teaching and Teacher Education*, *109*, 103544–103544. https://doi.org/10.1016/j.tate.2021.103544

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