Management of Hybrid Learning in Resource-Scarce Communities in Nigerian Schools

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Abstract: This paper focused on the management of hybrid learning in resource-scarce communities for private and public schools, drawing insights from Nigeria. The study employed a systematic approach, consisting of an extensive literature search, article eligibility assessment and synthesis of findings. The authors offered a comprehensive analysis of the challenges and benefits associated with hybrid learning. It highlighted the importance of hybrid learning in addressing educational disparities and examined challenges faced in its implementation. Enhanced student engagement, improved learning outcomes and increased access to educational resources were identified potential benefits of hybrid learning. Effective strategies for managing the adoption process include comprehensive planning and preparation, stakeholder engagement, public-private partnerships and targeted government policies that promote hybrid learning in resource-limited communities. In conclusion, the review provided a thorough analysis of challenges and potentials of implementing hybrid learning in resource-scarce communities in Nigeria. Effective training on technology use in the classroom and continuous support for teachers is crucial to overcoming the challenges. Based on the review, it is recommended, amongst others, that there should be collaborative efforts between private and public schools, government agencies non-profits and technology companies to consolidate resources and expertise, ensuring the long-term sustainability of hybrid learning initiatives. There is a need for teacher training and support for the success of the program.

Keywords: Blended learning; hybrid learning; educational management; resource-scarce communities; technology in Education.

Introduction

Hybrid learning is an educational approach that combines traditional classroom instruction with online or remote learning (Bates, 2019). It combines traditional classroom-based learning with online learning, offering students a flexible and personalized experience (Bao, 2020). This flexible method allows students to attend classes in person, remotely or both, providing access to various resources and tools such as online discussion forums, multimedia content and interactive activities (EDUCAUSE, 2021; Kirschner & De Bruyckere, 2017). Although hybrid learning offers many potential benefits, it also presents unique challenges that must be addressed in order to ensure its success. As schools and educators continue to explore the possibilities of hybrid learning, it is important to remain mindful of these challenges and work hard to overcome them in order to provide students with the best possible learning experience, especially in resource- scare settings.

Blended learning and hybrid learning are two terms that are often used interchangeably, but they have distinct differences (Bonk & Graham, 2012). Blended learning is a method to education that combines old-style classroom teaching with online education. In a blended learning environment, students attend classes in person and also complete coursework online. The online component of the course may include video lectures, interactive exercises and assessments. Blended learning allows for a more flexible and personalized learning experience, as students can work at their own pace and access course materials from anywhere with an internet connection. Hybrid learning, on the other hand, is a more flexible approach to education that combines in-person and online learning in a way that allows students to choose which mode of instruction they prefer. In a hybrid learning environment, students have the option to attend classes in person or online. This approach allows for greater flexibility and customization of the learning experience, as students can choose the format that works best for them. Thus, the main difference between blended learning and hybrid learning is the degree of flexibility offered to students (Garrison & Vaughan, 2008). Despite variations in terminology, both blended and hybrid learning prove to be effective educational approaches in various contexts. They offer increased flexibility and customization in instruction while also allowing students to engage with content in multiple ways and at their own pace (Means, et al., 2013).

In recent years, hybrid learning has gained popularity due to its ability to cater to diverse student needs and offer a more personalized learning experience. Hybrid learning has also emerged as an effective alternative to traditional classroom instruction during the pandemic. Its flexibility, engagement and potential for improved students' learning outcomes make it a valuable approach for both educators and learners. Hybrid education offers numerous benefits such as enhanced student engagement, better learning outcomes and decreased expenses for educational institutions (Sahu, 2020). Moreover, it provides opportunities for students who may not have access to traditional classroom-based learning due to geographical or financial constraints. The flexibility of hybrid education enables students to learn at their own pace and from any location with an internet connection (Abramson, 2021).

The COVID-19 pandemic has significantly impacted on global education, resulting in a surge in hybrid education. The COVID-19 pandemic accelerated global adoption of hybrid education and will likely continue to shape the future of education long after the pandemic ends (Bao, 2020). Due to the pandemic, many educational institutions closed their physical campuses and transitioned to online learning to adhere to social distancing measures. Hybrid education has emerged as a solution for these institutions to maintain quality education while ensuring the safety of students and staff (UNESCO, 2020). According to Means et al. (2013), hybrid learning has been shown to improve student outcomes in a variety of settings.

Hybrid learning can take on various forms depending on the specific needs of students and available resources. According to Horn and Staker (2014), some schools may opt for hybrid learning to supplement traditional classroom instruction with online resources while others may use it to offer greater flexibility for students unable to attend in-person classes. Horn and Staker argued that hybrid learning can be a powerful tool for schools seeking

to personalize learning experiences for their students. By combining the benefits of online and in-person instruction, hybrid learning can help students learn at their own pace while still receiving guidance and support from their teachers.

Moreover, hybrid learning enhances collaboration and communication between students and teachers, as well as among students (Garrison & Vaughan, 2008). It promotes active learning by offering diverse opportunities for students to engage with course materials. For instance, completing online quizzes or discussions before class, enables students to arrive prepared with questions and ideas for further exploration. One of the key benefits of hybrid learning is its ability to provide students with more flexibility and control over their own learning. By allowing students to access course materials and participate in discussions online, hybrid learning can help them better manage their time and balance academic responsibilities with other commitments. Additionally, hybrid learning can help students develop essential digital literacy skills for success in today's increasingly technology-driven world.

Nonetheless, hybrid learning poses distinct challenges that must be tackled to ensure its success (Johnson & Misterek, 2017). The challenge of guaranteeing equal access to technology and resources for all students, especially in underprivileged neighborhoods with limited technological availability needs to be addressed (Warschauer & Matuchniak, 2010; World Economic Forum, 2021). Implementing hybrid learning in resource-scarce communities present unique challenges (UNESCO, 2021), including limited access to technology and internet connectivity, inadequate infrastructure and insufficient teacher training. Furthermore, hybrid learning necessitates teachers to embrace new strategies and techniques that may be unfamiliar or uncomfortable (Li et al., 2023). Despite these challenges, potential benefits such as increased access to education, improved learning outcomes and flexible scheduling options for students can be achieved (World Bank, 2020a; World Bank, 2020b).

Addressing the challenges of hybrid learning in resource-scarce communities can lead to improved standards in both private and public schools. In Nigeria, hybrid learning has gained popularity due to the disruptions caused by the COVID-19 pandemic and its potential to enhance educational standards (UNESCO & McKinsey & Company, 2020). However, this approach presents significant challenges for the country's educational system that must be addressed for its success. These challenges include inadequate infrastructure, limited access to technology and the internet, and insufficient training for teachers and students.

Effective management of these challenges is crucial for improving education standards. According to a UNESCO (2023), hybrid learning can help bridge the digital divide and ensure access to quality education for all students. Therefore, examining the challenges and leveraging the benefits of hybrid learning in resource-scarce communities in Nigeria is essential for improving educational outcomes. This study sought to establish the Nigeria's experience in managing challenges and benefits within such resource scare communities. This study employed a systematic review approach to present

Effective Management of the Adoption Process

Effective management of the adoption process is crucial for the success of the hybrid learning in resource-scarce communities. This involves planning and preparing, selecting suitable technology platforms and tools, offering training and support to teachers and students and tackling any logistical issues that may emerge (Dorn et al., 2020).

Effective planning and preparation are integral to the adoption process, encompassing technology infrastructure, curriculum design, teacher training, student support and community engagement. A well-crafted plan ensures alignment among stakeholders, serving as a roadmap. Preparation involves training for educators and support staff to ensure optimal technology functionality.

In resource-constrained Nigerian schools, planning would help in identifying cost-effective solutions and to establish how existing infrastructure could be deployed for hybrid learning. Government initiatives, private partnerships and community involvement are all critical for a successful adoption process. As an example, the School Feeding Program of the Nigeria Government could be expanded and used to distribute mobile devices, laptops and internet connectivity to students in underprivileged communities to ensure equitable access and blended learning opportunity. The success of the adoption process would also rely on training teachers and students in digital literacy and the efficient use of resources (UNESCO, 2020).

Monitoring and evaluation, including student performance metrics, teacher and student feedback and attendance rates are important for successful adoption (Bernard et al., 2014; Li et al., 2022).

Ensuring that the advantages of hybrid learning are sustained, this would require cooperation among various stakeholders, including teachers, students, parents, administrators and policymakers. Establishing effective communication channels through meetings, workshops and forums is fundamental to a successful outcome. Notably, acknowledging and rewarding the proficient integration of technology would serve as an incentive, encouraging collaboration and advancing the attainment of hybrid learning in resource scare communities.

Models of Hybrid Learning

There are different models of hybrid learning including those in figure 1:
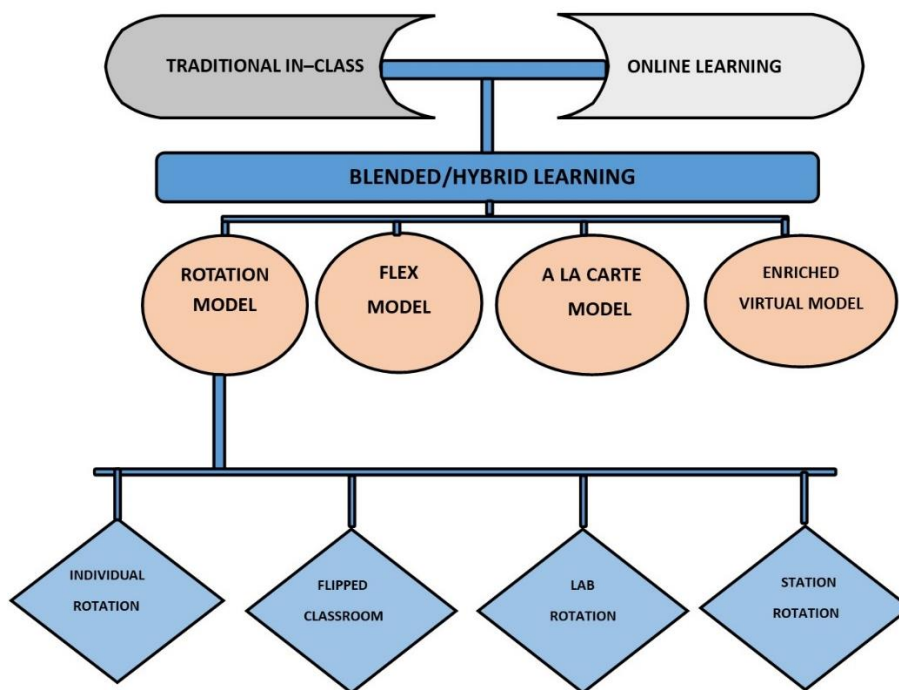
Figure 1: Models of Blended and Hybrid Learning

Station Rotation Model

The Station Rotation Model involves students rotating through a series of online and offline learning stations. Students alternate between various stations, such as online ones for digital assignments and offline ones for teacher-guided or group work (American Institute of Research, 2020). Each station offers diverse learning modes and activities tailored to individual needs. This model promotes personalized learning, small group instruction and student-centered experiences.

Lab Rotation Model

The Lab Rotation Model is a type of blended learning that involves students rotating between traditional classroom instruction and lab-based instruction. In this model, students spend a portion of their time in a traditional classroom setting with a teacher and then rotate to a lab setting for hands-on, experiential learning. This approach can be particularly effective in science and technology subjects where students benefit from practical, hands-on experience. In this model, students also spend a significant portion of their time in a computer lab, where they work on online assignments and receive support from teachers.

Flipped Classroom Model

In this model, students watch lectures or instructional videos online outside of class time and then come to class to work on assignments or projects with the teacher's guidance (Bergmann & Sams, 2012; Martínez-Jiménez, & Ruiz-Jiménez, 2020). The Flipped Classroom reverses the traditional teaching method by delivering instructional content, often online, outside of the

classroom. Students then engage in interactive activities and discussions during class time to reinforce their understanding of the material (Dunn, 2014). This model aims to personalize learning, increase student engagement and improve academic performance.

Flex Model
In the Flex Model, students have control over their learning pace and can choose to work on digital assignments at their own pace or attend traditional classroom sessions. Students have the flexibility to learn at their own pace and on their own schedule (Maxwell, 2016). The online component usually consists of interactive modules while the offline component includes activities such as group discussions and hands-on projects.

A La Carte Model
The A La Carte model of learning is a personalized approach to education that allows students to select individual courses or learning modules based on their interests and needs (Hunsinger, 2018). This model is often used in online learning environments, where students have access to a wide range of courses and resources. The A La Carte model can be beneficial for students who want to customize their education and focus on specific areas of interest.

Enriched Virtual Model
The Enriched Virtual Model of learning is a hybrid approach to education that combines online and in-person learning experiences. In this model, students typically spend the majority of their time learning online, but also attend periodic face-to-face sessions with their teachers (Picciano et al., 2022). This allows for a more personalized and flexible learning experience while still providing opportunities for social interaction and hands-on activities.

Benefits of Hybrid Learning in Resource-Scarce Communities
Hybrid learning has gained popularity in recent years due to its flexibility and ability to cater for diverse learning needs. In resource-scarce rural and urban communities, hybrid learning has proven to be potentially beneficial for several reasons.

Increased Access to Education
Hybrid learning can bridge the gap between urban and rural or remote students by offering access to online resources, ensuring equal education quality for all (OECD, 2021). Some Nigerian private schools have already adopted a blended model that combines classroom instruction with technology-enabled learning to provide affordable education for low-income communities. Hybrid learning offers students access to a diverse selection of courses and instructors while enabling connections with peers from various regions. Furthermore, it assists urban students in overcoming challenges such as overcrowded classrooms and insufficient individual attention from teachers.

Cost-Effective Solution
Hybrid learning can serve as a cost-effective solution for schools and educational institutions with limited resources (Boyarsky, 2021). Using online resources allows schools to decrease expenses related to textbooks, classroom materials and other aspects of traditional teaching. For instance, the Lagos State Government in Nigeria initiated a hybrid learning program called Eko-Konnect that offers free access to e-learning resources for students and teachers in public schools (Akoni, 2021). Hybrid learning offers a broader array of educational resources, particularly in regions with limited access to textbooks and other materials. By supplementing classroom instruction with online resources, students can achieve a deeper understanding of the subject matter and enhance their overall academic performance.

Customized Learning Experience
Hybrid learning allows students to learn at their own pace and on their own schedule (Raouna, 2022). This personalized approach to learning can help students who struggle with traditional classroom teaching methods. Students can focus on areas where they need more help and move quickly through materials they already understand. This flexibility can be especially helpful for students who have other commitments or responsibilities outside of school. For example, the Teach for Nigeria program uses a hybrid model that combines online resources with one-on-one coaching to provide a customized learning experience for students in underserved communities (Teach for Nigeria, 2023).

Improved Student Engagement
Hybrid learning can improve student engagement by providing interactive and multimedia-rich content that is more engaging than traditional textbook-based teaching methods (Guillot, 2021; Rukayah, et al., 2022). With hybrid learning, students have access to a variety of digital resources such as videos, podcasts and interactive simulations that

can help them better understand complex concepts. Moreover, hybrid learning allows students to learn at their own pace, which can lead to higher levels of motivation and engagement. For example, the LEAP Africa eLearning platform provides interactive content such as videos, quizzes and games to engage students and to enhance learning experiences (LEAP Africa, 2023).

Flexibility
Hybrid learning offers flexibility for both students and teachers. With access to course content from anywhere at any time, hybrid learning allows students to review materials as often as needed to fully understand the concepts being taught (Singh et al., 2021). In addition, teachers can use online resources to supplement their classroom teaching, providing students with a more comprehensive learning experience. Some schools in Nigeria have already adopted a blended model that allows teachers to access online resources and lesson plans to supplement their classroom teaching (Ololube, 2011).

Bridging the Digital Divide
Hybrid/blended learning bridges the digital divide in resource-scarce communities. By incorporating online learning into the curriculum, students are exposed to technology and digital tools that they may not have had access to otherwise (Gautam, 2020). Incorporating online learning into the curriculum prepares students for future academic and professional opportunities (Hew & Cheung, 2014).

Challenges of Hybrid Learning in Resource-Scarce communities in Nigeria
Implementing hybrid learning in resource-scarce communities in Nigeria presents significant challenges that must be addressed to achieve improved standards in private and public schools. Insufficient infrastructure and facilities present a significant barrier to implementing hybrid learning in resource-scarce communities in Nigeria. The lack of essential amenities, such as classrooms, furniture and electricity supply, hinders schools from delivering quality education through hybrid learning methods.

Lack of access to Reliable Internet Connectivity
One of the primary challenges of hybrid learning in resource-scarce communities in Nigeria is the lack of access to reliable internet connectivity and digital devices. According to a report by the Nigerian Communications Commission (2023), only 47.8% of Nigerians have access to the internet (Figures 2 and 3), most of them residing in urban areas. Similarly, according to a report by the National Bureau of Statistics NBS, only 41.5% of Nigerian households have access to the internet (Sasu, 2022a). However, as of 2022, Nigeria had nearly 84 million internet users and internet penetration amounted to over 38% of the population in 2022 and is set to reach 48% in 2027 (Sasu, 2022a; 2022b). However, in resource-scarce communities in Nigeria, as in most countries, there is a significant challenge in adopting the hybrid approach due to limited access to reliable internet connectivity and digital devices. This digital divide worsens existing educational inequalities and restricts opportunities for students in these areas (Martens et al., 2020).

According to a report by Statista (2023), the internet penetration rate in Nigeria has reached 55.4 percent in January 2023 up from about 50% in 2021 (Kemp, 2021). This is still one of the lowest levels of internet penetration in the world, with only about half of the population having access to the internet. This lack of connectivity is particularly acute in rural areas, where infrastructure is often poor or non-existent. As a result, students living in these areas are at a disadvantage when it comes to accessing online learning resources. This means that students in rural areas may not have access to online resources needed for hybrid learning. Additionally, even where there is internet access, it may not be reliable enough to support online learning activities.

Limited Access to Digital Devices
Resource-scarce communities in Nigeria face the challenge of limited access to digital devices such as laptops, tablets and smart devices. A survey by EdTech Hub revealed that only 4% of Nigerian households own a computer while a mere 1% have a tablet (Dele-Ajayi &Taddese, 2020). Consequently, many students cannot engage in online learning despite having internet access. Furthermore, only 10 to 20% of the population uses smartphones, with the majority relying on conventional cellular phones for voice calls and text messages. Estimates from various sources suggest the number of smartphone users to be between 25 and 40 million out of about 200 million (The Guardian Newspaper Editorial, 2021).

Inadequate Infrastructure and Facilities

Hybrid learning in resource-scarce communities in Nigeria faces challenges due to inadequate infrastructure and facilities. Nigeria is one of countries with the lowest classroom-to-student ratio in Sub-Saharan Africa, resulting in many children receiving education under trees or in deteriorating buildings unsuitable for effective learning (Majgaard &Mingat, 2012; World Bank, 2021). This inadequacy hinders the efficient implementation of blended learning and complicates the execution of hybrid learning as students may lack a conducive learning environment.
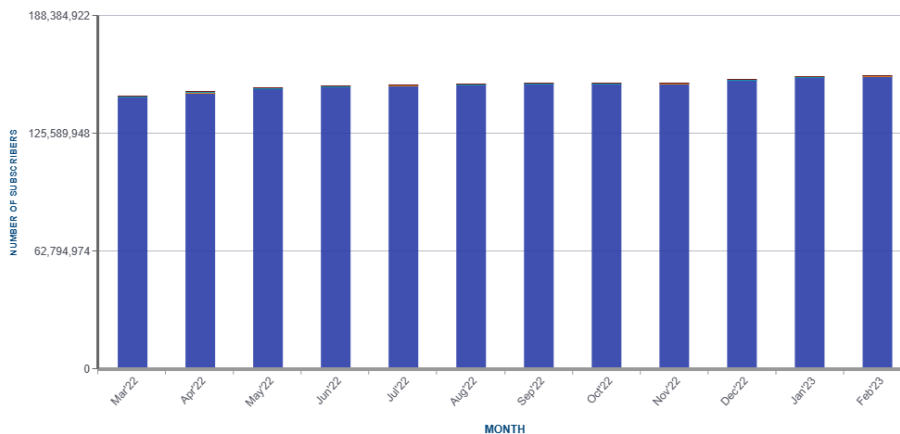

Figure 2: Active internet subscriptions by technology March 2022 – February 2023 (Source: Nigerian Communication Commission, 2023 Data
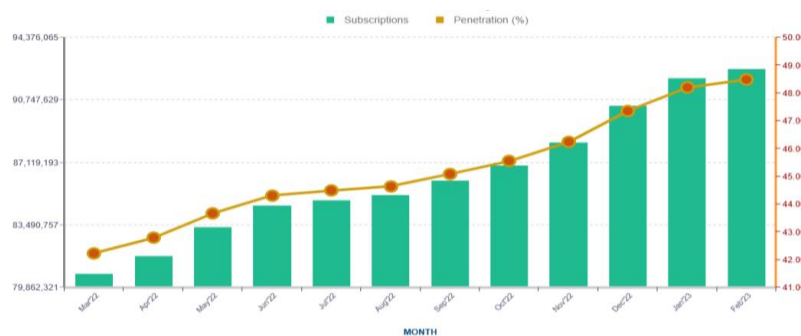

Figure 3: Broadband Subscription/Penetration data March 2022 – February 2023 (Source: Nigerian Communication Commission, 2023 Data)

Furthermore, some schools may not have qualified teachers capable of effectively facilitating hybrid learning activities. There is therefore a need for adequate training and capacity building for teachers and other stakeholders involved in implementing hybrid learning (Egbo, 2011). They also need training on how to effectively manage hybrid classrooms and provide personalised learning experiences. There is need for government intervention through policies that prioritize investment in infrastructure and facilities needed for hybrid learning. Hybrid learning has several benefits for elevating educational standards in both private and public schools; however, its implementation in resource-scare communities in Nigeria presents substantial challenges. Through appropriate government intervention, public-private partnerships, and capacity-building initiatives, these hurdles can be overcome, so as to enable the advantages of hybrid learning to be harnessed.

Solutions to Challenges

The following is how the aforementioned challenges can be addressed.

Providing Access to Technology

One of the most significant challenges of hybrid learning in resource-scarce communities is access to technology. Students in such communities may not

have access to computers, smartphones or the internet, which are essential for online learning. To address this challenge, schools should provide devices and internet access to students. For instance, the Lagos State Government in Nigeria has distributed over 10,000 devices to primary school pupils to aid remote learning during the pandemic (Lamai, 2020).

Tackling the Power Supply Challenge

A significant challenge of hybrid learning in resource-scarce communities is the unstable power supply. Many Nigerian communities lack consistent electricity, which hinders students' ability to engage in online classes. To overcome this obstacle, schools should offer alternative power sources like solar-powered devices or generators (Williams, et al., 2019). Some private schools in Nigeria have already implemented solar panels to power classrooms, laboratories, libraries and administrative buildings (Adam Smith International, 2023).

Prioritizing Teacher Training

While hybrid learning necessitates that teachers possess digital skills and utilize technology effectively, numerous educators in resource-scarce communities may lack these abilities. To overcome this obstacle, schools should offer training on using technology for teaching and learning. For example, Nigeria's Federal Ministry of Education has collaborated with Microsoft to educate Nigerian teachers on digital literacy skills. Microsoft Corporation, in collaboration with the Nigeria's Federal Ministry of Education, has introduced an educational framework for the digital transformation of primary and secondary schools in the country (Olaleye, 2018).

Content Development

Developing relevant and suitable online content for students in resource-scarce communities presents a challenge. Content must cater to the needs of students with limited access to resources compared to their urban counterparts. To overcome this challenge, schools should collaborate with local content developers to create culturally appropriate material. This digital content should align with the educational curriculum and incorporate local stories and examples.

Parental Involvement

Hybrid learning requires parental involvement to ensure that students participate in online classes and complete assignments. However, parents in resource-scarce communities may lack the essential skills or knowledge to support their children's education. To tackle this challenge, schools should offer training for parents on the need to support their children's learning at home.

Government Policies and Interventions to Improve Technological Infrastructure and Connectivity

Government policies and interventions are crucial in improving technological infrastructure and connectivity for blended and hybrid learning. With the outbreak of the COVID-19 pandemic, the Nigerian government has recognized the need to invest in technology to improve the education delivery. One of the government's significant policies is the National Broadband Plan (NBP) 2020-2025, which aims to increase broadband penetration from 33.31% to 70% by 2025 (Federal Ministry of Communications and Digital Economy, 2020). The NBP recognizes that access to affordable broadband is critical to achieving sustainable economic growth and development, including improving education delivery. The plan focuses on four strategic pillars: Infrastructure, Policy and Regulation, Demand Drivers and Funding/Incentives. The infrastructure pillar aims to increase broadband access by deploying an additional 120,000 km of fiber optic cables across Nigeria. The Policy and Regulation pillar aims to create an enabling environment for investment in broadband infrastructure by streamlining regulations and policies. The Demand Drivers pillar aims to stimulate demand for broadband services by promoting e-learning, telemedicine, e-commerce and other online services. Finally, the Funding/Incentives pillar aims to provide funding and incentives for operators to deploy broadband infrastructure in underserved areas.

Another significant policy is the National Policy on Education (NPE), which recognizes the importance of technology in the education delivery (Federal Ministry of Education, 2004). The NPE emphasizes the need to integrate technology into teaching and learning processes at all levels of education. It also recognizes the importance of providing teachers with training on using technology for teaching purposes. The Nigerian Communications Commission (NCC) has implemented several interventions aimed at improving technological infrastructure and connectivity for blended and hybrid learning. The NCC has also implemented the Wire Nigeria (WIN) Project, which aims to provide

fiber optic connectivity to all government-owned universities and tertiary institutions in Nigeria.

Public-Private Partnerships Support

Public-private partnerships PPPs play a crucial role in supplying essential resources and devices to schools, especially in resource-scarce communities (Bello, 2017). In Nigeria, hybrid learning has become indispensable due to the COVID-19 pandemic, posing challenges for both public and private schools in obtaining the necessary tools for effective learning outcomes. To overcome these obstacles, collaboration between the government and private sector organizations through PPPs can offer valuable services and infrastructure for public benefit (Arogundade & Sasere, 2019). In the realm of education, PPPs can offer essential resources and devices, such as laptops, tablets and internet connectivity to schools. Although they have demonstrated potential in enhancing access to these resources for schools in resource-scarce communities, challenges related to accountability, transparency and the involvement of private sector organizations in public education must be addressed. In summary, PPPs can significantly contribute to providing vital resources and devices to underprivileged schools.

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In this review, access to technology for rural and urban poor communities are possible if the government is intentional about achieving one or more of the initiatives in Table 1.

Table 1: Providing access to technology in resource-scare communities

Program suggestion	Description
Digital Inclusion Programs	The government should launch digital inclusion programs that aim to provide affordable or free devices to low-income families. These programs should also include digital literacy training to ensure that people know how to use the devices and access educational content.
Public-Private Partnerships	The government should partner with private companies to provide required devices and internet connectivity to poor communities. For example, the government can negotiate with internet service providers to offer low-cost internet packages to low-income families who purchase devices from specific vendors.
School-Based Programs	The government should work with schools in poor communities to provide laptops, tablets and smartphones to students. Schools can also provide Wi-Fi hotspots or other internet connectivity options to students who do not have internet access at home.
Community Technology Centres	The government should establish community technology centers where people can access computers, tablets and smartphones for free or at a low cost. These centers should also offer digital literacy training and support services.
Mobile Libraries	The government should deploy mobile libraries equipped with laptops, tablets and smartphones to poor communities. These libraries can also provide Wi-Fi hotspots or other internet connectivity options.

Conclusion and Recommendations

Based on the findings, the study concludes that hybrid learning in resource-scarce communities grants access to quality education for students who might not have had the opportunity otherwise. It offers flexibility and reduces the cost of education. However, managing hybrid learning in resource-scarce communities presents several challenges that must be addressed. The primary obstacles include limited access to technology and internet connectivity, limited students' participation in online classes and shortage of qualified teachers capable of effectively managing the hybrid learning environments. Therefore, managing hybrid learning in resource-scarce communities requires a holistic approach that addresses challenges while leveraging the benefits. This method combines traditional classroom techniques with online and digital resources, offering students diverse and engaging educational experiences. By adopting hybrid learning, Nigerian schools can address challenges like limited resources and insufficient infrastructure while using technology to enhance education quality.

To optimize the hybrid learning in resource-scarce communities, strategies such as providing access to technology and internet connectivity, training teachers on managing the hybrid learning environments and securing funding and resources should be considered. The government should provide adequate funding and resources required to support the implementation of hybrid learning models. Ministry of education should provide training to bridge the gap in digital skills. Hence, it is

crucial for all stakeholders, policymakers and educators to collaborate in ensuring effective strategies. They also need to invest in resources and infrastructure needed in promoting hybrid learning, thereby providing quality education in private and public schools.

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