



**Emerging Challenges in Mathematics Lesson Delivery .... (Adamu & Sirajo, 2022)**

## **Emerging Challenges in Mathematics Lesson Delivery under New Normal**

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### **Abstract**

The COVID-19 pandemic has hit the education sector particularly hard, with schools being forced to cancel all face-to-face lessons during the school shutdown, forcing many institutions to adapt to purely online classes. Because technology is rapidly being integrated into classroom instruction, the best approach to handle this issue is through online learning or classes. Technological improvements have had the biggest impact on mathematics education and its influence on pupils because it provides a realistic knowledge of the goals and content of the subject. It introduces new approaches and resources to mathematics instruction. This can be seen in a variety of ways, from new ways of presenting information to new resources and assessment methods for students. It also discussed the challenges faced while using radio, television, and online lessons, which have to do with a lack of steady power supply, internet service problems, lack of network coverage, and the vulnerability of parents to afford any of the learning gadgets. This paper recommends that, among other things, government and non-governmental organisations should supply internet data and allow students to have free internet access to access online mathematics lesson delivery.

**Keywords:** Online learning, Challenges, Mathematics, Technology.

### **Introduction**

In early January 2020, scientists uncovered a new infectious sickness caused by a unique coronavirus. The COVID-19 pandemic has caused devastation in schools and institutions all across the world since then (Hew et al., 2020). The COVID-19 epidemic has had a significant influence on the education sector. Schools have become the most dangerous places to be in terms of safety and security (De Villa & Manalo, 2020). According to the United Nations Education, Scientific, and Cultural Organization (UNESCO), 1.5 billion children and young people in 195 countries were affected by school closures as of mid-April 2020, with closures affecting children and young people from pre-primary to higher education (UNESCO, 2020).

All face-to-face lessons were cancelled during the school shutdown, prompting several institutions to transition from face-to-face instruction to solely online classes. In both developed and developing countries, virtual or online instruction has become the only option. On the other hand, developed countries have little or no trouble enrolling in online learning, whereas developing



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nations, such as Nigeria, where the physical set of classrooms is always preferred over online schooling, have a number of issues (Abdullahi et al., 2020).

Nigeria's Federal Ministry of Education (FME) and the Universal Basic Education Commission (UBEC) have formed a special task team to coordinate the education response to the COVID-19 outbreak (UNESCO et al., 2021). The task team's purpose is to provide students in Nigeria's 36 states and the Federal Capital Territory with support, information, and resources so that they can continue their education and personalize their learning at home. The task force has its own page on the FME website (<https://www.education.gov.ng/>), and it promises to provide real-time assistance with learning resources as well as kid monitoring at home (Ludi, 2020). To assist with this, the Task Team has developed a "Learn at Home Program" (LHP). The webpage is regularly updated to reflect the status of the LHP's implementation, online resources and alternatives for equity in teaching and learning, recommendations on channels that states can resources made accessible for this goal, as well as mechanisms for tracking and monitoring them.

In collaboration with national and state governments, FME and UBEC aim to provide context-appropriate materials that allow students, instructors, and schools to benefit from home-based learning. These resources include homework and assignments, reading materials, radio, television, web content, and online learning (Chirinda et al., 2021). To enhance learning, the Task Team's digital learning resources are grouped into three categories: First, the West African Examinations Council's (WAEC) e-Learning platform offers resources to help students better prepare for exams. Second, during the school closure time, a partnership with the Mobile Classroom App was developed to provide its courses and resources open to all students. Third, during this time, thanks to a collaboration with School Gate, all primary school kids will be able to access its courses for free (Ugochukwu-Ibe, & Ibeke, 2021).

Due to the fear of a pandemic, the Oyo State government of Nigeria has implemented a school-on-air programme to ensure that learning continues during the school's closure time. Airtel has provided each participating student with 500MB of free data. According to the Oyo State Task Force, the programme will be broadcast on the Broadcasting Corporation of Oyo State (BCOS) radio and television channels, with the goal of reaching 60 to 70 percent of the student population (Ludi, 2020). In another related development, states such as Borno, Adamawa, Yobe, and Kaduna, among others, also use radio programmes to facilitate the teaching and learning of mathematics and other subjects for primary and secondary school students during the period of lockdown (Abdullahi et al., 2020).

Based on the most recent analysis by Kalogeropoulos et al., (2021), shows that During the COVID-19 pandemic, the usage of radio, television, and internet teaching and learning of mathematics has a good impact on students at home and aids in preserving students' learning processes in the new normal. Longer school closures, on the other hand, have the potential to interrupt critical school-based programs like immunization, school food, and mental health and psychological assistance. A lack of social connection and disrupted behaviours can also cause stress and anxiety. (Garcia, 2020).

### **Impact of Technology in Mathematics Lesson Delivery**

When students must remain outside of the classroom, technology is one of the most crucial tools for assisting remote learning. With so many diverse measures being taken by governments



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around the world, the COVID-19 crisis provides an opportunity for policymakers to learn from one another and collaborate in order to lessen the pandemic's effects and potentially rebuild better (Chirinda et al., 2021). The Harvard Global Education Innovation Initiative, HundrED, the Organisation for Economic Co-operation and Development (OECD) Directorate for Education and Skills, and the World Bank Group Education Global Practice have joined forces to provide countries with information and resources on the global education response to the crisis (Reimers et al., 2020).

Technological advancements have had the greatest impact on mathematics education because they have changed our understanding of the goals and content of the subject. They have also introduced new approaches and resources to mathematics instruction. This can be demonstrated in a variety of ways, including new ways of presenting material, new resources, and new testing and assessment methods for students (Karp et al., 2016). Technology in the classroom has evolved to the point where it is no longer a choice, but rather a necessity. Teachers can use technology to help their students prepare for the real world, which has become increasingly tech-dependent; being tech-savvy is now expected of students (Karp et al., 2016).

According to Perienen (2020), as technology pervades practically every aspect of life, the education sector is not immune to this paradigm shift. As a result, students are increasingly turning to online learning, particularly in mathematics. Then, a new way of teaching and learning has emerged since the start of the new school year has been postponed. As a result, online learning has the potential to increase the number of courses offered to students, especially those in rural and urban areas. One of the promises of online technologies is that they can help non-traditional and underserved students gain access to higher education by delivering a plethora of educational resources and experiences to people who might otherwise only have access to on-campus higher education (Dziuban et al., 2018).

As a result of the disruption caused by COVID-19, schools have been obliged to employ online learning. Abdullahi et al. (2020) opined that teacher education is a critical issue, and schools will need to adapt their budget allocation to meet this new demand. Teachers are increasingly asked to use tools with which they are unfamiliar in online education, which needs substantial training. Teachers who were not used to teaching online before the stay-at-home order have now been forced to learn various online methods of teaching and delivering content to students (Abdullahi et al., 2020). According to Simamora (2020), online learning gives students with conflicting schedules of concurrent subjects more flexibility, improves the teaching of technology skills by embedding technological literacy in academic learning content, and gives lecturers professional development opportunities like mentoring and learning in scientific community colleges.

In today's society, it is thought that using technology in the classroom has a favourable impact on students' success and attitudes toward mathematics education. Furthermore, incorporating technology into mathematics instruction allows teachers to deliver rapid feedback to pupils while also encouraging active student learning, collaboration, and cooperation. It also helps teachers provide individualised learning opportunities and flexibility for their students (Eyyam & Yaran, 2021). In another related study, Kelly and McAnear (2021) stated that technology helps students live, learn, and work successfully in an increasingly complex and information-rich society. Students and teachers must use technology effectively. Kelly and McAnear (2021, p. 4) highlighted that within a sound educational setting, technology can enable students to become:



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1. Capable information technology users
2. Information seekers, analysers, and evaluators
3. Problem solvers and decision makers
4. Creative and effective users of productivity tools
5. Communicators, collaborators, publishers, and producers
6. Informed, responsible, and contributing citizens

### **The Challenges of E-Learning in Mathematics Lesson Delivery**

Electronic learning (e-learning) has been recognised as the best option for continuing to teach and study mathematics during the pandemic. Baytiyeh (2019) emphasised that it is critical to retain learning and communication during a school closure in any way possible. Burke (2020) argued that, in order to change education, specific steps must be implemented during the COVID-19 school closure period. Maintaining communication with students, parents, teachers, and other staff members via e-mails and phone calls; maintaining access to learning materials via apps such as Google Apps (e.g., Google Drive, Dropbox, Cloud...) for education; Moodle Cloud, Edmodo, or social media tools (e.g., WhatsApp, Twitter, YouTube, Facebook, Instagram, Yahoo...). In addition to the barriers provided by the changing anatomy of learners' continuing education, Franchi (2020) expressed concerns regarding students' future possibilities as a result of new modalities.

Despite the fact that pedagogies were available, the stakeholders, such as traditional rulers, educationists, concerned citizens, parents, teachers, etc., have responded positively to a request for online learning. As a result, teachers will need to rethink and retool themselves, i.e., retrain and prepare themselves in order to ensure that online classes are conducted holistically, creatively, and with a personal touch in the future (Gonzales & Lansangan, 2020). To create effective e-learning materials, educators must educate themselves to be good designers, content experts, and competent users of hardware and software (Hassan et al., 2012). Over the last decade, online education has evolved into a cutting-edge teaching and learning tool (Obana, 2020).

Online learning commonly includes email, chat, rib discussion, streaming audio and/or video, and a whiteboard. The flexibility of time and location, the interaction of students and instructors, and the other qualities that online learning shares with distance education are the main distinctive features of online learning (Simamora, 2020). This method is used by learners of all ages, from working adults who want to continue their education while working to parents who enrol their children in classes to gain new skills. These students can now further their studies via a variety of distance learning options. However, internet accessibility was described as the "backbone" of online learning (Chantel, 2002). Without a stable and efficient connection, students will only face frustration instead of developing and enhancing literacy based on the new technology (Cortez, 2020).

During this COVID-19 pandemic, one of the major challenges of online learning mathematics among secondary school students is the lack of access to computers, smartphones, data, laptops, and tablets (Abdullahi et al., 2020). Institutional factors were the most important barriers that impeded teachers and students from properly adopting ICT in mathematics teaching and learning during COVID-19. In this case, it demonstrates that the use of ICT requires quality and strategic ICT training for teachers and students. All these things, and many more, make online



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learning easy for secondary school students (Chenoby, 2014). Gonzales and Lansangan (2020) underlined that online learning, as a novel modality, makes use of technology and the issues that come with it, such as (a) Internet connection, (b) teacher training, (c) parent monitoring, (d) hands-on sessions, and (e) system preparation. The challenges that e-learning faces in the new normal of mathematics teaching and learning have been outlined by Eze et al. (2018, p.11) as;

1. The high cost of internet data
2. Poor internet connectivity
3. The high cost of personal computers, such as laptops, smart phones, and desktops
4. Teachers' inability to assist students in developing the skills and training required to make an e-learning platform effective.
5. Unstable power supply in Nigeria, especially in rural areas, is one of the major challenges e-learning faces in learning mathematics.

Furthermore, different applications and technical issues, burden on parents, additional tasks for working parents, mobile network issues, lack of developing social skills, duration of teaching online vs. face-to-face sessions, plenty of distractions in the home environment, non-availability of teaching material and resources are just a few of the challenges that primary and secondary school students are likely to face during the COVID-19 pandemic (Brown et al., 2020).

Numerous researches such as Dziuban et al. (2018), Canonizado, (2020), Mohammed and Dar, (2013) devoted to the benefits of online education show that online learning is equally as good as traditional classroom learning. Flexible and self-paced learning, lower costs, increased virtual contact and collaboration, improved time management, sharpened critical thinking skills, and new technical skills are all benefits of online learning (Obana, 2020).

Federal Government of Nigeria FGN, (2014) cited in Abdulaziz and Mode (2021) highlighted five benefits attached to e-learning in teaching and learning of mathematics.

1. It provides creative and innovative teaching and learning of mathematics
2. It offers flexibility in terms of the needs of the learners
3. It empowers learners to be self-reliant.
4. It helps students to achieve better value in terms of numeracy skills and other creative activities
5. Lastly, it generates a professional workforce and fulfilled citizens.

### **Impact of Using Radio and Television in Mathematics Lesson Delivery**

From the very beginning of its debut in the latter half of the nineteenth century, radio became a tool of the mass media. (Sarmah & Lama, 2017). In the sphere of education in general, and remote education in particular, radio continues to play an important role. In terms of ownership, radio remains a significantly under-utilized medium in distant education in Nigeria (Creed & Perraton, 2001). They added that, the National Policy of Education's skeletal provision for distant education, a lack of finance, and the government's monopoly on broadcasting are all major obstacles (Creed & Perraton, 2001). Radio broadcasting in schools has a number of advantages for both students and teachers. This type of distance education is beneficial in rural areas where poverty is high and education quality is harmed by a lack of skilled teachers and learning tools.

Rural students should be able to receive an equal and high-quality education as the rest of the city's population (Erick, 2015). The goal of using radio programmes to teach mathematics to





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primary and secondary school students was achieved, as the children scored significantly higher in math after participating in the programme. When students who learned through radio were compared to those who learned in face-to-face classrooms, it was found that radio instructional programmes were more effective and resulted in beneficial results (Galda & Searle, 1980). The study evaluators discovered that radio programmes are beneficial in increasing the knowledge levels of people who know the least, which in this case were rural pupils. Despite the fact that the radio broadcast to schools' programme has been in place for a long time, several studies have revealed that it continues to face difficulties (Wambaria, 2013). The purpose of the radio broadcast to schools is to increase access to high-quality, equitable education for all students in primary, secondary, and higher institutions, particularly in economically depressed rural areas (Kiruhi et al., 2009).

Some states in Nigeria, such as Borno, Adamawa, Gombe, Zamfara, Sokoto, Oyo, Kano, Kaduna, Ondo, Kwara, Yobe, among others, have accepted the use of radio and television programmes for the teaching and learning of all topics taught in primary and secondary schools since the inception of COVID-19 (UNESCO et al., 2021). The federal government has also placed a focus on alternatives to home schooling for students. The teaching of mathematics through radio and television programmes has gained popularity and benefits for students, but none of this would have been possible without the assistance of their parents and mobile teachers walk them through the sessions and assist them with any issues they may have with activities or homework.

Following the federal government's announcement of a lockdown, radio and television programmes were used for teaching and learning mathematics and other topics that have become an integral element of Nigeria's educational infrastructure, which can be seen as a new normal in the education system, especially at the primary and secondary school levels. Under the new normal, the challenges of using radio and television in mathematics teaching and learning as stated by Asiago et al. (2014) are as follows:

1. Lack of a steady power supply, especially for those using television programmes
2. Poor strength of signals that transmit the programmes from the source to the recipients.
3. Children of vulnerable people, particularly those who cannot afford to buy television or radio, are unable to access the programs.
4. There is a scarcity of lesson support materials from the government and other organizations.
5. Lack of proper support from school administrators
6. Speed of the radio teacher in the presentation of the lesson

### **Conclusion**

We are all aware that teaching and learning during the era of the COVID-19 pandemic has been influenced by many factors and challenges that were not familiar to us before the emergence of the pandemic. When the country was shut down as a result of the epidemic, a variety of strategies were implemented to keep pupils learning at home in the early months of 2020. Among the programmes that have been introduced by government and non-governmental agencies are radio and television programmes, online learning, and other distance learning platforms. All these are to reduce the spread of the disease among learners.

Many states in Nigeria and in other countries have integrated the use of these programmes in the teaching and learning of mathematics and other subjects into our daily lessons despite the fact that



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the strength of the pandemic has greatly reduced to the barest minimal, as the reports from the Nigeria Centre for Disease Control (NCDC) show. These programmes have now become part of the "New Normal" strategies in the teaching and learning of mathematics. Thus, many states have adopted radio, television, and online learning together to complement teaching and learning of mathematics.

### Recommendations

1. Governments and non-governmental organizations should keep on assisting these programmes by providing a steady power supply in order to continue operating for the many benefits of remote students.
2. Parents should also be involved in coaching their children when the programmes are running, especially at home.
3. There should be mobile teachers that can go round in order to help students that might need assistants during the mathematics programme.
4. Students should be encouraged to make use of all the programmes in order to have full access to mathematics activities.
5. The government should provide internet data to students for free in order for them to access online mathematics lesson delivery. It should also encourage service providers to improve and maintain robust service bundles for their consumers in order to make teaching and learning easier.

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