

ONLINE TEACHING, LEARNING, AND ASSESSMENT IN A TIME OF GLOBAL UPHEAVAL IN NIGERIAN HIGHER EDUCATION

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Abstract

Times of global upheaval, such as the Covid-19 pandemic, have prompted an urgent shift to online learning and assessment in educational institutions around the world, including Nigeria. During the coronavirus pandemic, many schools turned to online learning and various forms of ssblended learning to educate children who were not allowed to attend school. This equally provides new opportunities to explore alternative online learning and assessment settings that improve student academic performance as part of a university-wide strategy. This paper discusses the various online teaching and learning options available for teachers and instructors during the global upheaval, the nature of assessment before and during times of global upheaval, the challenges of online assessment in times of global upheaval, and the guidelines for conducting online assessments in times of global upheaval. Existing research shows that in times of global upheaval, educators utilize different assessment techniques in their formative assessment practices. However, formal formative assessment techniques (paper-and-pencil tests) were used more frequently than informal formative assessment techniques. By embracing and adapting technically enhanced assessment and learning, this paper proposes to refocus formative assessment to include both formal and informal techniques. Lecturers are encouraged to incorporate online learning and assessment methods into their curriculum.

Keywords: assessment, online assessment, COVID-19 pandemic, times of global upheaval, online teaching and learning

1. Introduction

The sudden eruption of Coronavirus (COVID-19) epidemic really devastated Nigeria and every other country, including the education sector. It affects all economic activity. The 2020 COVID-19 pandemic resulted in the sudden closure of all primary, secondary and tertiary institutions. The pandemic has affected both developed and developing countries, causing national economies to decline. The federal government's complete closure of Nigeria's airspace, waters and land brought a complete standstill and immense hardship to the Nigerian education system. Ebrima (2021) reports that schools were closed in 186 countries, affecting about 74% of total student enrolment worldwide. The upheaval has affected roughly 1.6 billion students in at least 190 countries in the world (Kaisara & Bwalya, 2021; Tadesse & Muluye, 2020; UN, 2020). The disruption of schools calendars and activities has equally affected nothing less than 94% of the world student's population, with up to 99% living in low- and middle-income countries. (UN Sustainable Development Goal, 2020). The UNESCO Institute for Statistics UIS (2020) found that the pandemic has reduced

opportunities for many disadvantaged children and young people to continue learning, further widening existing education gaps. This includes people living in low-wage areas, girls, internally displaced persons, people with disabilities and other vulnerable and disadvantaged groups.

The learning losses from times of global upheaval are likely to cross the current generation and negate decades of progress in addressing the gender gap in women's access to quality education (Coman, Țîru, Meseșan-Schmitz, Stanciu & Bularca , 2020). It is very likely that nearly 23.8 million children and young people will be excluded from or denied access to education (UN, 2020) in the next year due to education disruptions. The major concern of Nigerian government during the global turbulent era was saving the lives of her citizens despite the fact that this decision impacted negatively on her educational system, students, teachers, parents and other stakeholders (Ajogbeje, 2021). Ajogbeje (2021) further reported that all forms of learning processes were halted. Primary, secondary and tertiary institutions students went home, which in turn deprived teachers of their duties, and disrupted the traditional academic calendar across the country. Prior to that, there was little preparedness for distance or digital learning and the COVID-19 pandemic has indeed exposed the shortcomings, inadequacies and lack of readiness of Nigerian higher education institutions for the transition to basic online learning (Aborode, Anifowoshe, Ayodele, Iretiayo and David, 2020).

Oxford English Dictionary defines online learning as a mode of instruction in which students learn a full course of work exclusively through electronic and online media, giving them full control about when, how and where they learn. That is, all learning takes place outside the school walls. Topping, Douglas, Robertson & Ferguson (2022) report that what they consider to be online learning is very different from what some say is that students use the school internet system to access a web program in school and teacher supervision. They claim that it is not e-learning, but a program that can be classified as computer-based instruction (CAI). Teaching and learning environments incorporate many innovative teaching methods, some of which involve the use of technology through blended learning. The introduction of blended learning programs (combining face-to-face and online teaching) is one of such innovations, but their adoption, especially in developing countries, faces the challenge of innovating effectively and learning to be in education. Blended learning (BL), a combination of face-to-face and online instruction (Graham 2013), is widely adopted in higher education in what some scholars call a “neo-traditional model” (Ross and Gage 2006) or the “new normal” in course delivery (Norberg et al., 2011). Lewis and Parsad (2008) also defines BL as "a combination of online and in-class instruction that reduces a student's time in class". Blended learning is a style of education in which students learn through electronic and online media as well as regular face-to-face instruction in the classroom, which gives them partial control over when, how, rate and place of learning (Oxford English Dictionary). In other words, part of the learning takes place outside the school and part of it takes place within the school. Typically, dissemination of information takes place outside the school, and interactive elements such as teacher-peer discussions take place in school. However, interactive sessions between teachers and students or between students and peers can also be provided via video conferences, online discussions, message boards or other means.

2. Online Digital Teaching and Learning

The recent global turmoil has caused Nigeria and other affected countries worldwide to consider alternatives and mechanisms to the traditional method of teaching and learning, otherwise known as face-to-face method. Education is traditionally delivered in classrooms where students can interact directly with teachers while respecting their physical presence (Dziuban, Hartman, Juge, Moskal & Sorg, 2006). Regular or traditional classroom instruction can be defined as a structured program of face-to-face instruction that is primarily teacher-centered, including teacher-provided feedback and teacher-led discussion. Teaching materials include textbooks, lectures and individual written assignments. Students are brought together in the same classroom and they are taught a unified curriculum by the teacher. Routine teaching varies, particularly from country to country, and such comparisons are made for a very heterogeneous set of practices and are highly arbitrary. The Nigerian education system relies heavily on a traditional face-to-face teaching environment with limited emphasis on online learning pathways. Therefore, in the early stages of COVID-19, it was not possible to facilitate the educational process through traditional methods. All public schools are considering and implementing online education as an alternative to learning. In this new mode of social interaction, Nigerian education institutions encounter many problems in the continuous practice of teaching and learning (Bryson & Andres, 2020). Restrictions imposed by the Nigerian government forced tertiary institutions to rapidly adopt e-learning technology to facilitate distance learning. However, the transition from traditional physical classrooms to virtual education infrastructure has been a challenge for Nigeria and many developing countries (Aristovnik, Kerži, Ravšelj, Tomaževi & Umek, 2020).

Many developing countries have underutilized e-learning in the past, at the expense of face-to-face learning processes. E-learning has been integrated into the education system of many developed countries long before the outbreak of COVID-19, and more than 80 percent of universities in these countries were equipped with e-learning facilities (Dziuban, Hartman, Juge, Moskal & Sorg, 2006). Schleicher and Reimer (2020) found that most OECD countries have reduced the use of online platforms and online learning tools with educational content for learning activities during the global upheaval. Estonia worked with private services to provide free educational content to students while schools are closed (The Ministere de l'Education Nationale et de la Jeunesse, 2020). A distance learning programme known as "My Class at Home" (or *Ma classe a la maison*) was made available by France to all its primary and secondary school students. With the onset of the global upheaval, only a limited number of higher education institutions in developing countries have established platforms to develop educational e-strategies (Kenney, Hermens & Clarke, 2004) to promote blended learning (BL). Nigeria has online digital learning alternatives, but few teachers, students and institutions are implementing them. The adoption of e-learning has had an impact on the design, planning, teaching and management of the learning process. It is well known that a properly implemented e-learning system allows students to get feedback and knowledge on a subject through various sources and platforms, which also increases students' confidence in applying what they have learned to real-life situations (Al-Rahmi, Othman & Yusuf, 2015). E-learning is one of the most powerful tools that can be used effectively in blended learning. Blended learning is a popular educational model that is capable of changing the institutional teaching environment for the next educational era, while opening up new opportunities for the combination of traditional face-to-face classroom methods with online educational materials to enhance teaching and learning (Bauk, Šepanovi & Kopp, 2014).

E-learning is a broad concept that includes the collaborative use of the Internet and other

basic learning materials and tools for educational purposes (Fry, 2001). It can be defined as the combined use of internet and multimedia technologies to facilitate and improve learning and teaching facilities. Accessibility, interactivity, flexibility and digital communication are considered essential characteristics of online learning. According to Abbad, Morris and Nahlik (2009), e-learning refers to the process of learning that occurs through electronic or digital media. It is simply a platform and system that facilitates the process of learning through the internet using electronic devices. It is divided into two categories, that is, internet-based e-learning and computer-based e-learning. Computer-based e-learning refers to the comprehensive use of available software and hardware in two ways: computer-assisted learning and computer-guided instruction. Internet-based learning is an advancement of computer-based learning in which content available in a virtual environment is used. Learning Management Systems (LMS) such as WebCT Vista, Blackboard and MOODLE, ATUTOR, video conferencing technologies such as ZOOM, Google Meet and Google Classrooms can be considered the most commonly used places to complement or enrich learning opportunities (Nurakun, Ismailova & Dündar, 2018).

Computer-based educational games and computer-assisted collaborative learning, which are currently used primarily in schools but clearly have the potential to be used in out-of-school settings. Computer-based educational games are designed to help users learn about certain topics, expand concepts, reinforce development, learn about historical events or cultures, or help them improve skills learned through playing. Games involve interactive play that teaches goals, rules, structure, adaptation, and problem solving, which are often depicted in stories. They provide feedback and facilitate learning by enhancing enjoyment, engagement, motivation, creativity, social interaction, and emotion, including self-gratification. Games can be single-player, two-player, or multi-player, or part of a large-scale arrangement system of multiple teams or cooperative opponents, such as a massively multiplayer online game (MMOG) (Manesis, 2020). Computer-Assisted Cooperative Learning has to do with how technology-assisted cooperative learning can enhance peer interaction and teamwork, including facilitating the transfer of knowledge and learning (Lipponen, 2002). Participants use web-enabled software tools to support social and collaborative, distance learning from each other and their teachers. An online or blended learning which is school-based, with students interacting with digital materials or using web-based materials at school under the direct supervision of teachers, can be classified as Computer-Assisted Instruction (CAI). Therefore, CAI is a program of computer-based instructional materials using a combination of text, graphics, sound, and/or video, with which students can interact and monitor learning that occurs.

Research has shown that technology can assist in various educational processes (Hung and Yuen, 2010), a positive impact on student learning support (Dyson, Vickers, Turtle, Cowan and Tassone, 2015), and help teachers toward professional advancement and development (Manca and Raineri, 2017; Donelan, 2016). Onyema and Deborah (2019) also opined that the use of appropriate educational technologies increases accessibility to learning resources such as Massive Open Online Courses (MOOCs), and multiple learning approaches to meet the needs of diverse learners. They further added that the increasing use of technology in education has transformed teaching methods from the traditional approach where teachers are perceived as dispensers of knowledge to a more flexible approach where they act more as facilitators, mentors and motivators to inspire students to participate and learn. However, DataReportal (2020) reported that about 60% of Nigerians are not available on the internet

and mobile phone data, which could be used as a learning intermediate, is more hopeful. It was also reported that approximately 169.2 million (83%) Nigerians are eligible for mobile access. However, 84.5 million (50%) of these Nigerians live in metropolitan areas. Most of the population with internet access tends to be socially and economically affluent and urban households. These are mostly private school students who already have an academic advantage over their public school peers. ICT use is limited to children from poor families living in rural areas where access to the Internet, computers and other devices is low and where the local language is predominant over English.

3. Assessment of Student Learning Outcomes

Assessment is an integral part of educational practice and widely known for its continuous process in helping students to understand and improve their learning outcomes. It also enables classroom teachers to gather a variety of information about student performance. Assessment may include general observation and analysis of a sample of homework, teacher-made achievement tests, and classroom learning activities. Formative evaluation is a form of learning assessment normally designed to identify students' strengths and weaknesses in order to improve future classroom learning outcomes. Whereas summative evaluation is carried out at the end of an educational activity, when a final judgment is made on assessment or readiness to proceed, and usually includes formal examinations. Shepard (2000), in his report, proposes a classroom assessment model in which the content and nature of assessment should be improved and the information and knowledge collected should be integrated into the classroom learning and teaching processes. He further opines that assessment is primarily designed to help students learn better and improve their learning outcomes and not necessarily designed to be used for evaluating students or certifying the end products of their learning.

Formative assessments are important because they provide clues about changes in education (Andersson & Palm, 2017; Menendez et al., 2019). In the classroom, the assessment process takes shape when actions taken by students and teachers change instruction and provide necessary information needed to monitor student learning outcomes. Thus, formative assessment focuses on classroom learning objectives and activities and it enables instructors to monitor teaching and learning on daily basis. Another component of formative assessment is assessment as learning, with an emphasis on peer and self-assessment. Assessment as learning under instructor supervision allows students to use the assessment process as a learning opportunity (Bennett, 2011). Teachers use formative assessment methods or tools to assess how well students are achieving learning objectives (Angelo & Cross, 1993). Arrafii & Sumarni (2018) and O'Keeffe et al. (2020) claimed that assessment for learning can be achieved using formal and informal assessment methods. They further claimed that formal assessment methods include paper-and-pencil tests such as classroom teacher-made tests, take-home assignments and exercises.

Conversely, informal assessment method includes evaluation interviews (Muhonen et al., 2020). Of the two methods, informal assessment method is reported to be more effective for class change and lifelong learning than formal assessment method (Nieminen et al., 2020). The use of informal formative assessment method encourages student creativity and encourages participation in class discussions. This allows educators to track students' thought processes and quickly change teaching methods to close learning gaps. However, Aji and

Hartono (2019) emphasize that student learning requires a combination of both assessment methods and that one should not replace the other. Classroom teachers are now mentors, motivators and facilitators of students learning. They use assessment methods to assist them in changing and shaping their learning strategies. However, teachers usually adopt different variety of formative assessment methods during their teaching engagements and careers. Given the COVID-19 outbreak, how have choices about formative assessment methods changed over time? Hence, the researcher believes that there is need to adopt credible and reliable formative assessment method. Given this important responsibility, do higher institution lecturers use formal, formative online and/or face-to-face assessment methods equivalent to paper-and-pencil examinations? Or do we need to rely primarily on online and/or face-to-face training and assessment sessions? Research to date shows the potential to identify formative practices in higher education. However, what the researcher did in this paper was to analyse the empirical literature on formative evaluation methods in higher education and not to focus on the methods used.

Formative assessment generates information that helps students to bridge learning gaps and achieve their learning goals (Black & William, 2018). Formal formative assessments are usually planned and developed by teachers to monitor student learning, and students receive feedback and written information about these assessments (Griffin et al., 2016). Feedback is provided only when the teacher grades the assessment work. Conversely, informal assessments are arbitrary and unpredictable. This includes assignments and class discussions (Muhonen et al., 2020). A situation in which teachers use class discussions and conversations to assess students' understanding of class concepts (Ruiz-Primo & Furtak, 2006). Unlike formal assessments, informal formative assessments provide immediate feedback. It also encourages students to participate in class and helps them reflect their knowledge and understanding of class concepts under the guidance of teachers. In the formative assessment method, students are asked to raise their hands or raise their hands together to demonstrate their understanding of learning a new concept. Sometimes it's as simple as asking students to complete self-assessment tasks. A formal assessment method, commonly referred to as the "written exam," was applied. Classroom tests, quizzes, and graded assignments are examples of such methods (Heritage, 2013). These are norm-based tests (i.e., tests that compare students to each other) and criterion-based tests (i.e., students meet criteria). The tests used to define formal formative assessment methods are pre-planned and prepared by teachers (Bales, 2019) and follow a response-assessment-feedback cycle. In this process, teachers give assessment tasks in the form of tests, students respond in normal sentences, and teachers evaluate and provide feedback over time. A formal approach to formative assessment in the context of higher education may consist of assessment work and testing, interim testing, practice, and computer-aided adaptive testing. The informal method of formative assessment promotes communication in the classroom. Teachers use observations, oral questions, presentations, interviews, and video discussions to assess students' learning outcomes (Menendez et al., 2019; Asamoah et al., 2022).

Online-Based Assessment

One of the most important aspects of online teaching and learning is the assessment of a learner's skills and abilities. Assessment has equally become an integral part of blended learning. Students are now opportune to develop their skills and receive distance learning support in order to demonstrate their learned skills and receive further support to improve

their learning. Ndibalema (2021) and Sozen & Guven (2019) claimed that online assessment includes providing all forms of feedback, assessing student performance, and managing learning in an online environment. They further claimed that with no face-to-face interaction between teachers and students, online learning can be assessed regularly through multiple tools such as electronic tests, quizzes, assignments, projects, presentations, portfolios and discussion forums. Eros and Fleming (2003), in a study comparing online and traditional examinations, found that online examinations achieved better results than traditional examinations. He further reported that online examinations should be seen in multiple forms as a form of continuous diagnosis of student performance. Almeida & Monteiro (2021) also highlight several innovative online platform features with different tools that can be used for the assessment of students' competencies and provision of immediate feedback to students on their learning performances.

Biggs & Tang (2011) opined that how assessments are appropriately matched to learning outcomes can clearly lead to constructive learning practices. There are several studies that describe the benefits of online assessment for student learning. For example, Baleni (2015) highlights the benefits of online assessment, including improved student engagement, greater flexibility of time and place to complete assessment tasks, faster feedback, and less time spent grading. Similarly, online assessments have been shown to be less stressful, cheaper and more efficient to measure language learning abilities that traditional tests cannot measure (Ndibalema, 2021). Fitriyah & Jannah (2021) also reported that online assessment provides students with opportunities for self-practice and self-assessment, thereby saving teachers time on reading and grading, and ultimately ensuring better student interaction. Universities and other institutions of higher learning are experiencing a paradigm shift in learning, teaching and assessment practices as classes and lessons are now online, except in a few situations where face-to-face interaction is required. Educational activities, including formative assessment, require the use of these devices when learning online, and students without access to these devices are less likely to participate in learning and assessment. Despite these challenges, in the future, a combination of online and face-to-face education will be needed even after global turmoil is over (Tartavulea et al., 2020). This is necessary to improve the infrastructure readiness of schools and to motivate both teachers and students to use such devices in teaching and learning.

4. Online Assessment Challenges in Times of Global Turmoil

After the suspension of all school activities in March 2020 by the Federal Government of Nigeria, most teachers struggle to acquire the knowledge required for online learning. Since then, teachers have become familiar with other Moodle-related educational platforms such as Google Classroom, Google Meet and Zoom. However, most Nigerian universities and higher institutions have established usage guidelines that are expected of teachers. Each model or platform is taught online in synchronous or asynchronous mode and teachers of higher education must continuously develop synchronous and asynchronous teaching and learning methods to ensure continuity of learning. However, teachers continue to apply synchronous and asynchronous teaching methods, but face challenges (Guangul et al., 2020).

Another major challenge is adapting to the new education model, availability of stable internet in the rural areas and the provision of technical assistance to students while accessing online courses. The sudden movement from face-to-face teaching and assessment to online

learning during the global crisis poses challenges for online assessments and this necessitated a review of assessment methods and the discovery of new forms of assessment suitable for virtual environments. Most of the lecturers in our universities and other higher institutions are not digital literate. The scenario during the global crisis was the case of digital illiterate lecturers teaching digital literate students. Nigeria's educational institutions, lecturers and students did not anticipate the transition from private environments to the internet, neither were they prepared or trained to handle such sudden change. Daniels et al. (2021) carried out a study on online assessment practices in language teaching and learning, and they identified some limitations such as: internet connectivity, lack of proficiency in using online tools, lack of technical infrastructure, problems with student participation, lack of reliable online assessment systems, increased fraud rates, and plagiarism.

5. Guidelines for Online Assessments in Times of Global Turmoil

Online assessments require the preparation of trainers and educational institutions. Institutional readiness includes institutional policies, resources, and practices. Before and during recent times of global upheaval, many Nigerian educational institutions lacked the policies and necessary infrastructure for online teaching and assessment, and more importantly, internet coverage (Ajogbeje, 2021). Institutions with online learning management systems (LMS) benefit from information technology (IT) support and friendly teacher-student relationships (Hodges, Moore, Lockee, Trust & Bond, 2020) and for those who do not have such facilities, a number of options are available and some of them are free (Westhuizen, 2016). Good infrastructure and cheap software as well as hardware are useless if teachers are not well trained, adequately motivated and convinced of the needs and benefits of transition (Westhuizen, 2016). According to Rahim (2020) the alignment of assessment activities with written learning objectives is very important in online assessment. In times of global upheaval, reliable assessment of emotional and psychomotor domains is currently a very difficult task. Proficiency tests are very difficult to evaluate without severely compromising validity (Yudkowsky, 2020). Assessment designers must be aware of the fact that students have different ways of accessing teaching and learning in a variety of contexts based on geographic location and other factors, in order not to discriminate against students with little support for online teaching and learning. There is need to differentiate between synchronous and asynchronous online teaching and learning processes. Synchronous online teaching and learning methods can make learning more like a school environment (Tomar, 2018) where teachers and students can always communicate face-to-face using methods such as video conferencing, chat and assessment can be through oral examination methods such as vivas. Synchronous methods often require a good internet connection and good timing. Asynchronous is a non-real-time online teaching and learning process (Tomar, 2018) whereby learning materials are downloaded and students can access them at their convenience or when internet access is permitted. Skills include video uploads, lecture notes, and social media-style interactions and asynchronous evaluation methods include tasks and projects.

Online assessment also provides learners with useful feedback on achieving stated learning outcomes. Hence, evaluators must ensure proper balancing of formative and summative evaluation (Westhuizen, 2016). The main purpose of summative assessment is to measure student performance at or near the end of schooling, and the literature on summative assessment in online teaching and learning is limited (Dennick, Wilkinson & Purcell, 2009).

Assessment methods influence how students learn (Schuwirth & Van Der Vleuten, 2011), and online assessments should aim to encourage positive student learning behaviours. Online testing should be carefully planned, taking into account schedules and other important events in the student's learning behaviours (Hodges et al, 2020). An online assessment format can be confusing at first, but appropriate and feasible, multiple domain-specific formats are recommended for comprehensive and detailed measurements using Bloom's classification level, formative level, or both (Hodges et al, 2020). Formative and final examinations should have a reasonable duration and formative tests, allowing multiple attempts improves student learning outcome (Benson & Brack, 2010).

The provision of assessment feedback to students on test items (Downing, 2003) is effective, helping students plan their studies and the development of self-management skills (De Villiers; Scott-Kennel & Lark, 2016). One area of assessment that should be clarified is the relationship of activities and assignments to course goals and outcomes. General evaluation specifications, including evaluation plans, types of evaluation, weightings for each method, and acceptance criteria should be well defined (Benson & Brack, 2010; De Villiers; Scott-Kennel & Lark, 2016). Benson & Brack (2010) opine that information must be provided about specific test methods. When it starts and ends, the examination duration, types of questions administered, and the number of attempts allowed. They further opine that feedback on examinations should also be clarified and the procedure or who to contact when having technical difficulties with the examination must be provided or indicated. Online assessments support learning when there is timely, rich, and constructive feedback that makes assessments effective (Westhuizen, 2016; Boitshwarelo, Reedy & Billany, 2017). Timely feedback allows learners to make self-corrections (Ajogbeje, 2023) and equally helps learning by providing motivation and support (Ajogbeje, 2012; Benson & Brack, 2010). Feedback content is information about the accuracy of student responses (Ajogbeje, 2023) to multiple-choice questions or true/false answers and this can be entered into the LMS scoring system and automatically assigned upon completion of the examination. Additional information on how to improve learning outcomes is also helpful (Boitshwarelo et al, 2017; Boström and Palm, 2023) and can take the form of online chat or links to specific learning resources for further learning. One-to-one student learning is desirable for optimal students' learning outcomes (Benson & Brack, 2010) and can be effectively delivered via email or instant messaging applications.

Threats to validity include contextual underrepresentation related to sampling and design issues, and constructs related to assessment integrity including item quality, passing score determination, fraud and test security issues (Downing & Haladyna, 2004). Despite its high prevalence, there is no conclusive evidence that fraud occurs significantly more frequently in online settings than in traditional assessments (Boitshwarelo et al, 2017). In fact, human and software monitoring of online examinations has become big business (Krueger, 2015), and cheating is even harder (Ross, 2020). Strategies for overcoming this threat begin with encouraging honesty in students and they should be reminded of and subscribe to a policy of academic honesty (Benson & Brack, 2010). Clear communication about results and expected performance also helps (Gikandi, Morrow & Davis, 2011). For cognitive assessment, preference is given to multiple-choice questions with context-rich stems (Boitshwarelo et al, 2017; Schuwirth & van der Vleuten, 2004) and open-ended questions with case studies as well as the use of short-term quiz-style assessments (Rowe, 2004). Online test protection is

currently being achieved either by direct monitoring of students online or using software applications while conducting such tests (Krueger, 2015), but obtaining such systems is costly. Technically, online cheating in examinations can be curbed by question randomization, questions and options rearrangement, reduction in the number of attempts a student can make, limitation in the time allowed for test-taking, and the deferment of the automated feedback until after test completion.

6. Conclusion

The coronavirus crisis is a serious and sudden shock, but perhaps not the last. Educational disruption has had and will continue to have a significant impact on education and other areas. The COVID-19 pandemic has raised many questions about the value educational institutions provide, such as networking, social opportunities, student assessment, and educational content. The upheaval of COVID-19 has forced Nigeria and the world at large to rethink alternatives to face-to-face teaching and learning and the conduct of online assessments. However, Mineo (2020) says there may be a silver lining to this upheaval, and the transition to online assessment and instruction all represent temporary states that may not return to their original state (Lau & Ross, 2020). Dignan (2020) and Lau & Ross (2020) state that online teaching and assessment are likely to occupy a higher proportion of future curricula, and they see this as a positive development of online learning. The adoption of e-learning has had an impact on the design, planning, teaching and management of the learning process. It is well known that a properly implemented e-learning system allows students to get feedback and knowledge on a subject through various sources and platforms, which also increases students' confidence in applying what they have learned to real-life situations (Al-Rahmi, Othman & Yusuf, 2015). Given this potential, educational institutions will do well by preparing their physical and human resources and applying good design principles to online teaching, learning, and assessment.

COVID-19 has taught us the need to shift our learning and assessment processes from traditional classroom settings and face-to-face lecture formats to online digital and blended learning. E-learning is one of the most powerful tools that can be used effectively in blended learning. Blended learning is a popular educational model that is capable of changing the institutional teaching environment for the next educational era, while opening up new opportunities for the combination of traditional face-to-face classroom methods with online educational materials to enhance teaching and learning (Bauk, Šepanovi & Kopp, 2014). Our educational institutions should start developing courses and programs that can integrate online learning and teaching into the school curriculum. Going forward, lecturers and teachers will need to enrich and supplement their own content with content available online from other institutions. Digital technology opportunities can be explored and used beyond emergency solutions in global crises to provide new answers to the questions of what, how, where and when people learn. The pandemic has truly tested our anticipatory preparation and ability to deal with massive disruptions of educational systems, and our responsibility now is develop a more resilient society and virile educational system as a legacy.

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