Journal of Studies in Science and Engineering

EngiScience Publisher

Review Article

Education in the Virtual Space: A Sustainable Strategy for Achieving Tension-free and Inclusive Learning in COVID-19 Dispensation

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Article Info

Article History

Received Nov 02, 2021

Revised Nov 19, 2021

Accepted Nov 20, 2021

Keywords

COVID-19 dispensation

Student-centered learning

Tension-free education

Virtual Learning

Virtual space

Abstract

Apart from scalable classrooms, learning in virtual space for pro-technology and pro-Internet generation contributes significantly to developing their inherent domains. This process manifests through the use of digital materials, making the pedagogical scheme enjoyable, catchy, innovative, and inclusive. Today's staggering educational challenges of tertiary institutions, because of the COVID-19 Pandemic, call for operational rejig. Still alarming is the difficulty of containing the recent evolution into variants. Sequel to this, different countries adopted various strategies to achieve tension-free and inclusive learning environments as part of the 'new normal.' This study addresses the pertinence: Could the use of virtual spaces for instructional delivery constitute sustainable strategies for tension-free, and more inclusive, methods of educating learners during and after COVID-19 dispensation? To answer this question, we adopted a theory-based adaptation conceptual approach and inside-outside approach and brought the Nigerian situation into focus where virtual learning was skeptically debunked because of operational and policy slackness. This study agreed with the positive potentials of virtual space and disagrees with earlier studies deficient at uncertainty variables. Based on these, recommends areas of gaps filling in developing countries' education systems, who stopped learning during the pandemic period for future adoption and adaptation.

1. Introduction

Universities are communities dedicated to the learning and personal development of their members. They have been placed as repositories and generators of knowledge to provide efficient scrutiny of public policy, the social, and economic plight of their members, and surrounding community development. While fulfilling their social obligations, universities are currently being at risk of unintentionally contributing to the further spread of COVID-19. To cope with the dread unleashed by the pandemic, many countries decided to temporarily shut down the gates to all higher and lower institutions of learning. However, it is glaring that the strategies have shown significant restrains but with critical short-falls. Pathetic to mention that the impact on learners is obvious, families and tutors all struggle with psychological health, communal

living segregation, and dwindling economic welfare. Its impacts on the nation's economy display an adverse consequence at large. A look at empirical evidence shows that the pandemic has disrupted the education system of nations. Several scholars asserted that the in-person class system of learning is already losing its relevance. In this regard, demand for a more rational educational approach is trending [1]. In their view, social distancing strategies adopted by higher educations to address the tension caused by COVID-19 require curriculum redesign to foot online learning. From the uncertainty caused by the pandemic, schools' closure was common around the world to contain its spread [2]. Based on this condition, users of educational institutions and parents are now burdened with unexpected hardships and learning paralysis. Just in 2020 alone, an international center reported that this contagious has altered 90% of the in-person classes worldwide, and reiterated that various lower and higher tiers of learning close down in approximately 191 countries [3]. Their findings also show that about 1.723 billion learners were distressed, constituting 98.4% of total learner's enrolment, while 77% of institutions in Africa closed and school activities stopped.

The affected 1.5 billion learners from preschools to tertiary levels induce untold fear in our society. This situation has forced governments of advanced countries to opt for online learning possibilities and methodologies to continue academic operations [4,5]. A set of these scholars further explained that approximately 66% of developing countries use mass media (Television and Radio) to deliver virtual learning. Among these nations, distance education via online learning and broadcast are combined to disseminate information to learners in rural areas of East Asia, Central Asia, Europe, the Pacific, the Caribbean, and Latin America. Their findings show that, in North, Middle, and East Africa, 22% combined broadcast and online learning, radio plus television occupied 28% only, and online learning alone featured 40%. While in South Asia, their findings show that broadcast medium for learning covered 40%, whereas integration of online learning with the broadcast cumulatively amounted to 50%.

Another investigation focused on Sub-Saharan African countries shows that only 11% patronize online learning, and 23% adopted broadcast together with online learning [6]. Based on the constant need for safe lives from the COVID-19 inrush and control tension, some developing countries now disseminate information through broadcast and online learning [7]. However, upon resumption of schools, un-preparedness overshadowed the situation for lack of facilities and digital equipment to mount virtual classes. Operational evidence shows that public universities in Nigeria with ICT units were temporarily inactive during the pandemic dispensation. The aftermath of the problem in the country's education system showed a return to traditional methods of face-to-face pedagogy but was unsustainable with the times. Such steps ignored the risk traceable to that conventional approach. This attempt caused serious tension and panic among tutors and their learners. This fettle has resulted in the tutor's lack of engagement in the classroom with the students for fear of contracting the virus. Whereas, some instructors avoided lectures completely, giving rise to a poor relationship with colleagues, and disinterest in pursuing their job and career

development. Alternatively, most students who are afraid of the spread of the pandemic decided to stay home for safety and miss weekly lesson sections. Parents have questioned the preparedness of schools in terms of meeting up with the COVID-19 guidelines before they can release their vulnerable children. Our institutions were chaotic during the pandemic era and would take time to recover from the shocks is paraphrased from students' voices. Teaching and learning, widely known for interaction between teachers and learners suddenly turned polarized by the virus. Those who lost loved ones to it still struggle to recover. In the midst of this uncertainty, the need to source alternative solutions for continuing learning was a top priority for policymakers. It was these underpinning concerns that gave rise to this study on education in the virtual space as a sustainable strategy for achieving a tension-free and inclusive education in COVID-19 dispensation.

2. Conceptual Framework on Virtual Space in COVID-19 Pandemic Dispensation

A virtual space (VS) is a boundless online learning ideate space, offering learners and tutors a freer atmosphere to conduct learning procedures wired with digital tools to inculcate experiential knowledge on users. It is also referred to as a system that offers tutors and learners digital-based instruction aimed at creating interactive and engaging learning processes. These platforms also provide opportunities where tutors create, store and disseminate instructional content, plan and implement instruction and foster effective communication between learners and their tutors without necessarily coming together in physical contact. This happens in the form of e-mails and online discussions, as well as in real-time. The usage of virtual space technology decorates educators as facilitators of learning. They have to remain open to incorporating digital tools as instructional materials to facilitate the teaching and learning process. Virtual space in educational technology is an Internet-based platform for the digital aspects of instructional delivery, within an educational institution [8]. They present instructional resources, learning activities, and interactions within a course structure and provide for the different stages of assessment. This platform provides the new generation of learners with the 21st-century skills required to succeed in society. Such skills fall under different categories as higher-order thinking, collaboration and communication, leadership, and effective teamwork networking and problem-solving. Besides, most contemporary workforce needs potential employees who are creative, competitive, committed and well-informed, and perceptive about technology which this digital platform provides to learners [9]. However, a set of authors argued that 'Information and Communication Technology (ICT)' would elevate education quality and relate instruction with practical applications [10,11]. The present needs require tutors to provide a necessary guide for learners on computer literacy skills from primary level to higher institutions of learning because the virtual environment operates on digital protocols.

Virtual space platforms allow tutors to share their lesson materials and suitable secondary sources– notes, audio-visuals, and videos resources related to the course rubrics with learners at any time. These virtual rostrum permit learners to make submissions to their tutors and share their contents with colleagues and the public (if the work is not class restricted). It is a convenient channel for the tutor to track learners' records and progress. Most academic institutions now adopt these virtual learning tools to kick start educational operations online in the midst of the COVID-19 challenges. It is a tested option to wave off the classroom tension associated with the spread of the contagion witnessed by close contact in physical learning spaces [12]. Of course, other universities use virtual space to disseminate coursework to their learners, these strategies are used in the educational context, to achieve better learning outcomes and to cope with the tension instigated by the COVID-19 pandemic [13]. VS learning concept also in-corporates terms like 'online learning, e-learning, distance learning' or internet-based learning [14]. A pilot survey conducted on tertiary students' adaptability to online education aligned with the 'new normal' situation around the globe [15].

It was noted that university instructors are harnessing the virtual space tech into laboratory sections and simulation to explain engineering and scientific courses [16,17]. Complementarily, VS is also a technology that supports learning through in-person virtual meetings on-screen displays [18]. These learning spaces provide easy-to-use, participatory and inclusive methodologies to combat the tension and intimidation associated with face-to-face learning. Users would be in the same classroom (virtual class) to perform all the functions obtainable in a physical classroom without direct contact with peers [19]. Another researcher pointed out that virtual learning tech advantages energize distance learning undermined in some university communities, and display sustainable content sharing among users via Information Technology, and Internet broadband interlink [20]. This environment helps to facilitate the shift from top-down or unidirectional lecturing methods and passive learners to a more interactive, co-operative approach in which tutors and students co-create the learning process [21]. The virtual learning platform uses mobile communication gadgets-tablets, mobile phones, iPad, and personal digital assistants (PDAs) to host learning [22].

VS empowers collaborations as well as learning activities through games and other interactive premises [23]. Some educators regard it as a software tool that supports pedagogical management via the use of internet facilities [24]. There is also a consensus by other scholars who asserted that the innovation is holistic, likening it to computer-assisted instructions (CAI) [25]. Over the passage of time, VS has evolved as a digital classroom and a social space powered with curricular and extra-curricular routines, and functions as a shared workspace and online assessment kits [26]. There is an occurring resonance which connects different opinions, declaring virtual space as "computer software tools that complement computerized learning facilities, such as Learning Management System (LMS), Learning Support System

(LSS), Learning Content Management System (LCMS), Course Management System (CMS), Managed Learning Environment (MLE), and Learning Platforms (LP)" [27]. Whereas VS was formerly operated as LMS and e-learning platform, it has morphed into "Massive Open Online Course (MOOC) or Modular Object-Oriented Dynamic Learning Environment (MOODLE)" [28]. As a reminder, the concept of VS that integrates 'face-to-face' and virtual teaching is called 'blended learning' [29]. Courses are synchronized, providing participants interaction medium in real-time. It further gives students the flexibility and civility to function at ease in front of their digital gadget screens.

2.1. A Tension-Free Education During A Pandemic Situation

Students learning under tension suffer from poor academic performance and resistance to school-related issues. It results in a lack of engagement in-class activities, school refusal, poor relationships with peers and tutors, and a disinterest in pursuing career passion and planning for their education. This situation affects their learning because tension impacts working memory. It worsens their ability to keep new knowledge and recall earlier learned information. That leads to under-achievement in their education. Hence, a tension-free education is the creation of a suitable learning environment, necessary in promoting a safe teaching-learning process. Fixing teaching and learning periods during the relaxed state of learners produces enjoyable outcomes. The reverse is the case when lower motivation set in. The emergence of the COVID-19 crisis introduced the stress and strain in our education system and on the path of the learners manifesting as inappropriate learning behavior, poor completion or missing class activity, and frequent absenteeism from class, as well as school phobia and drop-out-of-school tendencies in a long run. Educational psychologists associate the conventional classroom learning environment with a range of serious consequences viz., anxiety, low self-image, depression, discrimination, sickness, and panic attacks. Esbesen and Carson [30] argued that a learning environment associated with tension pushes learners to cultivate a poorer social and emotional change. Most times, they suffer physical health issues and low levels of emotional intelligence [31]. Another study supported that it leads to an increased rate of anxiety disorders in young adulthood [32]. There is a general acceptance that undue pressure and tension weaken learners' brain abilities to process information and COVID-19 induces such threats. In contrast, a safe, inclusive, and free from panic learning environment activates the brain to absorb and process more information.

2.2 Virtual Learning Spaces with Tension-free and Inclusive Qualities

Virtual space engages learners to take up an active role in situations without fear of discrimination. The learners develop original concepts, enabling them to better understand themselves and others in a broader context. Although group work is encouraged, it is insusceptible to assimilation while developing

sensitivity to the surroundings. The tutors and learners' active use of VS through the learning process and manipulation of in-built interactive elements boost the two parties' emotional and physical health. Hence, their learning domains-cognitive, affective, and psycho-motor receive the enhancement. The frequent use of it improves learners' intellectual capacity, sharpens their alertness to functionality and time management (cognitive domain). Their feelings and emotional level (affective domain) because of the attractive nature of this platform become inclined to both reception and response to the cognitive experience. A further movement of mind activation level to knowledge (psycho-motor) is possible, which activates, externalizes these affective conditioned and cognitive experiences in-to solidified growth, as well as their ultimate personality. Understanding that learners are full contributors to knowledge development as stipulated in constructivist approaches of learning [33]. Part of the concepts encourages tutors to recognize that learners' active involvement in virtual learning is a highly supportive context for their cognitive development process, easy to evaluate as sections are recorded, eliminates marginalization of learners, and offers tension management strategy during the COVID-19 pandemic confronting their learning.

Virtual learning spaces that promote a tension-free and all-inclusive learning environment include, but are not limited to, Google classroom, Big Blue Button, ePortfolios, 3D virtual learning environments, TutorRoom, WhatsApp, Fully Virtual Classroom, Flex Virtual Classroom, Telegram, Zoom, Microsoft teams, and Learning Management Systems. It is vital to note that some of these platforms require subscription payments after using the trial version. However, the advantage that most students and tutors have is that their universities handle subscription payments to grant them free access when they sign in with their universities' individual details. These free access incentives provided by universities globally are sustainable practices, but significant public universities in Nigeria are yet to adopt for healthy competitiveness and quality. Since this study is structured to answer a specific question, only six forms of virtual space applications from the examples mentioned are explained for emphasis in the sub-themes following.

2.2.1. Google Classroom as a Virtual Space for Learning

Based on Umar and Adamu [21], Google Classroom brings together G-Suite kits for both tutors and learners, "this virtual reality technology assists learners to co-create immersive experiences for deeper exploration and learning." This platform also acts as a digital, online organizer, where the tutor can save class paperless instructional materials and share the same with learners, and tutors can customize assignments

for each learner confidentially to aid their adaptation and progress without fear of intimidation [34]. Google in 2020 launched a collaborative, inclusive meeting environment where tutors can manage and access learners' academic performance. It affords them an all-in-one connection with learners anywhere-anytime to cope with 21st-century digital trends and exercise the contemporary innovations in education. The benefit of a tension-free education and socially inclusive learning surface as the procedures occur remotely to avoid direct contact with others. This classroom allows the tutors to add up learners, send them encrypted meeting details for a class meeting and participate in the discussions. Classrooms and classwork are set up in minutes and appear on learners' calendars. This platform provides an avenue for easy interaction and updates among the class members, but not limited to only academic purposes. Tutors can streamline the management of their classes, digitally organize, distribute, and collect assignments, coursework, instructional materials, discuss with learners about their classwork, and give them timely feedback about their performance. While learners can submit their work through this platform, to lessen tutors' out-of-class work time–convenience in marking and grading without carrying of paper loads about. These instructional tools motivate the tutor for additional career development because the home now performs dual functions-personal space and a workplace. Tutors can streamline formative assessment, which is used to spot learners requiring immediate support from tutors or extra classes.

2.2.2. Big Blue Button as a Virtual Space for Learning

Big Blue Button (B3) is a global open root web learning platform structured for virtual learning and supports the actual sharing of audiovisuals, video resources on a learning digital monitor [35]. This platform provides a tension-free and inclusive learning opportunity since it allows learners to join class discussions with their webcam. Class members from different locations are given access while in isolation, which was predominant in the novel virus era. This tool also enhances collaborative learning with web conferencing tools such as Zoom, Skype, and Recorder. With a global network of developers and companies providing commercial support. B3 has continued to evolve to meet the new normal needs and serve the contemporary society for both the tutors and learners without boundaries. B3 provides easy access, helps to make teaching easier, improves learner's achievement, and allows tutors to host live-online presentations, seminars, or other Webinars anywhere. This digital platform is designed to tackle the problem of social distancing and

eliminate the tension and panic of COVID-19 spread. The inconveniences faced by physically disadvantaged learners in solid classrooms deficient in universal design principles are remedied because they now join class sections from the comfort of their homes. B3 is simple to use and has many useful 'tools to engage users, online learning experiences such as interactive meeting room with audio, video, uploading of PDF and Microsoft Office documents, presentations, chats, polling, shared notes, and interactive whiteboard capabilities. It also secures learners' proof of identity so each lesson can have its own private room accessible to individual learners within the work environment.

Intended users of B3 software would have access to the virtual essentials for coaching, flipped classrooms, office hours, and teamwork. This platform combines self-study with asynchronous interaction to improve the teaching and learning process. This works with digital tools-computers, iPad, Web clouds, smartphones, and tablets. Class sections and contents are synchronized and saved on the cloud. At the end of every class meeting, the recorded versions are shared with members as personal study aids. In this platform, both parties can engage in issues related to the course and offer the instructor opportunities to invite and collaborate with other specialists on specific topics. To provide tension-free and inclusive learning, there is an option for tutors to share instructional materials with learners before the meeting date to ensure familiarization, effective communication, and active participation.

2.2.3. ePortfolio as a virtual space for learning

The ePortfolio is a collation of virtual artifacts, giving the learners a cloud space to centralize their academic received materials, downloaded documents, visual resources and outputs, as well as extracurricular activities, and more. In the academic ePortfolio, the learner decides who views the content in it, what artifacts should be added, how it is designed, and etcetera. A learner loses access to the LMS at the end of the course but, still retains the copyright title of their works in ePortfolios. The platform provides learners with the comfort of attending classes from home as a means of overcoming the fear of the COVID-19 pandemic and social vulnerability associated with the traditional classroom. Study materials are accessed by learners on their virtual platform to carry out academic work without any physical contact with their colleagues. Such activities take up different forms as a reflection on their previous work, effect corrections, and sharing with team members their contributions within the agreed time. ePortfolios encourages learners' originality and critical thinking, nurturing and boosting their morale [36].

2.2.4. 3D Virtual Learning Environments

Three-dimensional virtual learning environments (3D VLEs) provide an ideal context that includes cognitive and collaborative support tools to guide learners' learning. With recent advancements in technology along with increasing access to ICT, and coping with the dread unleashed by the COVID-19 pandemic. Many educators, scholars, academics, and learning communities are turning to 3D VLE as a powerful and productive instructional delivery space. 3D virtual technology is used to create an immersive and interactive learning environment to facilitate tension-free learning. By application in architectural education, 3D virtual tech in the form of VR nourishes learners' 'imagination during design' studio classes as a creative process [37]. These virtual spaces can be multi user virtual environments (MUVEs) or single users and by simulations enhance learners participation through exploring the observable world as an abstract domain to situate knowledge [38]. 3D VLEs were defined as online platforms, computer-based virtual reality providing three core elements 3D illusionist virtual space, interaction chat rooms (members communication), avatars (visual presentations) [39]. The platform also provides learners a healthy balance between their emotions and their learning environment against the traditional classroom shortfalls and the scary panic unleashed by the COVID-19 pandemic. The human factor in 3D VLEs allows learners to actively participate in the learning process, 'but through the effective scaffolding from tutors and peers' [40]. However, learners' mastery of difficult concepts is been solved, 'for instance, the relation between distance, motion, and time concepts are embedded in the lesson [41].

2.2.5. TutorRoom as a virtual space for learning

TutorRoom model permits individual learners to carry out learning at home to avoid unnecessary tension, favoring one-on-one sessions with their tutors virtually. Users do not have to attend physical classes daily. It is a good example of the enriched virtual learning space, which offers good tutoring management and helps to transform learners' learning experiences. This platform provides an inclusive avenue where users select features convenient for them. This model comprises, among others, interactive whiteboards, PDF uploads, videos, and messaging. It provides access to coursework anytime, regardless of your locality. Signing up immediately gives you access, including class presentations, discussions, and class activities. This learning space provides a comfortable and welcoming environment to work with and a digital option

to balance schoolwork with family activities [42]. All a user need is to install a virtual classroom application and you are good to enjoy all its benefits. The Team's built-in meeting features can be used by tutors to hold classes and coordinate discussion with learners, work together with virtual whiteboards and share instructional materials with learners. It improves users' accessibility and fosters an all-encompassing classroom. It does not stigmatize users and is free from tension, as well as in-built immersive reader capability. It is powered with real class topics for discussion and a built-in-rubrics for effective assessment of learning outcomes. These feedback mechanisms assist learners to make meaningful adjustments and improve their learning experiences [43].

2.2.6. WhatsApp as a Virtual Space for Learning

WhatsApp is one of the most popular and widely used communication platforms among university students. Its primary aim is for communication but shares several features with social media sites. It allows e-learners and m-learners to exchange texts, videos, and audio materials and for free calls and messages. WhatsApp platform gained global patronage from 2014 and was embedded with data disclosure transmission over a network, providing learners with (a) the opportunity to send and receive a variety of media, like images, audio messages, among users, (b) encourages participation, permits sharing of files to the size 20 MB in different formats, Word documents, JPEG, and PDF [44]. Though this platform is new on the learning platform, it recorded academic success, as a greater number of tertiary students prefer to use WhatsApp [45]. This platform "can be an appropriate platform for academic success provided the correct method is applied during teaching and learning process" [46]. It is a free messenger application that works across multiple platforms, the recent interface is Facebook. This platform develops with time and has shown support for pedagogy. Evidence shows that its design scale holds a maximum of 256 capacity per group discussion. It is easy to use and cost-efficient making it advantageous over other virtual learning types in terms of traffic. Based on this premise this platform is considered a safe social learning space because it offers an end-to-end encryption (E2EE) protocol. The tutor can use it for one-on-one text messaging to address individual learners' needs, challenges, and expectations.

3. Materials and Methods

This paper is a theory-based adaptation conceptual research, which seeks to unveil the potential of virtual learning as a viable pedagogical option in a pandemic situation. The framing concepts align with the

'focal phenomenon' proven to fit complementary values in designing the conceptual research techniques [47,48]. The methods first spotted the universities' dilemma to contain the spread of the COVID-19 Pandemic from different regions from the 2020s. Particularizing Nigerian public tertiary education as a critical sample. Further exploring the havoc wrecked on campuses on an inside-outside perspective, leveraging authors' firsthand experience at students unionism and teaching for the last 9 years coupled with participation on a compulsory semester course for doctoral students multidisciplinary structured with virtual education contents and general concepts/approaches in education in the 21st-century (Education for Learning). Because of this wealth of diverse practical contacts, explored and scrutinized the limiting claims of previous studies on the deficiencies of online learning which miscalculated its potentials of replicating face-to-face learning approaches with virtual tools in a pandemic situation. In contrast, illuminate the developing countries without a defined educational policy on the subject and open up a discourse that will provoke government and Public Partnership Participation (PPP) involvements in tertiary education beyond just education politics and contracts awards. The purpose is to drive trending societal demands for digitized human development at both local and global levels for the adoption of student-focused approaches in education pedagogy.

The concept of virtual space is brought to the center to showcase its usefulness to match with times, and remedial solutions to learning in a pandemic dispensation as exemplified in different developed contexts. Discussing its connection with Constructivist approaches of learning and other student-focused strategies that agree with the six levels of Bloom's Taxonomy (Basic knowledge, comprehension, application, analysis, synthesis, and evaluation). On the virtual learning, platforms explicated, an online search shows that there are more than 15 virtual applications but maintain three criteria selection that corresponds to the major aim of this essay strengthened and extracted from the works of [49,50]: (i) The ones that provided elaborate interactive web experience (ii) Learner friendly (iii) Subject unbiased. That process led to focusing on six types of virtual spaces, Google classroom, Big Blue Button, ePortfolio, 3D Virtual Learning Environments, TutorRoom, WhatsApp. The discussion anchored on the conceptual framework expounded and involved the observation of the COVID-19 events from in Nigeria within the period remarked, where the universities were unable to mount online learning. Finally, drew conclusions based on identified

operational and policy gaps especially in developing regions, and made general recommendations for countries and specific ones for Nigeria on the way forward.

4. Results and Discussions

The challenges of the pandemic necessitated large patronage of virtual space in the education sector globally, defiling all previous sentiments. Based on these trends, their merits are summarized in Table 1.

Table 1. Merits of Virtual Space Education

Positive Learning Areas of Virtual Space
Virtual space education gives learners flexibility since the scheme is not place bounded. Learners log into it using their institution's Educ-portals details to participate in class discussions. Improve learner's concentration as it eliminates tension and promotes positive thinking and brings about a stable state of mind that supports learner's memory and capability to retain knowledge learned.
It allows learners to access study materials, assignments, post comments, join discussions, contact their tutors and peers from an integrated spot. Enabling their request and receiving support from students' affairs, libraries, accounts, the International office, and the technical unit straight from their portals.
It provides tutors ample time for career improvements while meeting their job and family demands since they can attend classes from any locational context. Missing works are faster to rectify because the feedback mechanism links with individual social communication contacts/email addresses.
Provide learners with immediate feedback on activities. This paves ways for assessment and evaluation of the scheme for immediate and long-term improvements. Avenues to adapt coursework schedules for the need of individual learners without biases is embedded.
Tutors and administration mining of success data for quality assurance and performance are easy to simulate and communication among users is seamless.
It is more affordable than the traditional learning approaches. Its strategies are student-focused, making the teacher a coach and not the boss. Based on the evidence, eliminating the ills from a conventional classroom setting and open doors for cost and energy savings.
It is inclusive and fair for participants because all forms of bullying are trackable and accommodate diversity, equity, including the vulnerable population.

The challenge associated with virtual learning is learners' ability to manage distractions around their physical location while attending class meetings [51]. Internet availability also makes it easy for learners to be distracted and turn to social activities, which may be detrimental to their academics. Aside from that, learners learn differently; some prefer visual learning, while others may retain information through auditory or playway approaches. Based on this criticism, learners' creation of virtual communities is hard. Further emphasized that inconsistent internet connection, software bugs, and outdated or damaged hardware tend to interrupt the learning process. Other factors that hamper virtual learning are a lack of information technology know-how and inadequate manpower training [52]. Another scholar argued that learners still believe it is easier to learn in a traditional classroom than a virtual one [53]. That defiance exerts on tutors and learners socio-economic, logistical, and technical issues to adapt to this digital innovation [54].

In Sub-Saharan Africa, salient contributions from scholars on the subject identified four outstanding pertinence to virtual education (a) lack of personal computers by learners (b) Unstable Internet connections (c) unresolved proxies to broadband mobile networking, and (d) Most learners do not have large-screen mobile phones. The recent COVID-19 pandemic has prompted the training of more ICT teachers to rejig the present educational system. The situation in some developing countries like Nigeria is deplorable, where the ratio of ICT literate teachers to pupils in primary and secondary schools are approximately in the ratio 1:56:60 [55,56]. That indices show a poor ICT background to students entering the higher education training. These indicators are gaps that the present educational system struggle with. This calls for retraining of teachers to bridge these gaps if the prevent COVID-19 pandemic persists and for future contagious.

Distance learning methods (Television and radio) used in some developing countries are not robust for tutor-learner interaction. The missing part is the non-appearance of the learner's virtual image that raises tension and seclusion tendencies. The technique is teacher-focused, which negates the 21st-century learning approaches and concepts. In contrast to these mass media platforms, virtual space provides efficient interaction between the tutor-learner, narrowing distances by seeing each parties' virtual image on a screen, allows for screen sharing of each participant and flexible return to lecture materials at any time since sections are recorded and study resources can be reloaded before the class meeting.Virtual learning decline in Nigerian universities bear root to previous restrictive recognition accorded to academic staffs with online certificates and in way, education related national bodies legislation is unclear about it. Now beginning to

reconsider because of the current plight as result of the pandemic. That is traceable to the unpreparedness displayed. Other factors included lack of digital equipment and facilities, and inflexible curricula structure. On the other hand, the learners' sponsors incapability to provide digital gadgets compatible with virtual learning.

The arguments started by other scholars on the challenges of virtual learning show strength in a non-pandemic situation but weakness in a pandemic one. Based on this premise, this essay calls for a rethink of perception based on the conditional determinants–learners are barred from the physical classroom, already in isolation, battling with social distancing and panic, and exclusion from peers and even family members. An overwhelming thought on this essay depicts that virtual space fosters the practical, technological, inclusivity, and creative skills of the learners as a fascinating educational process. It allows tutors/learners to take part in the class periods dynamically and eases learners' tension at the same time. Having listed some variables calling for virtual learning that aligns with contemporary living, such propositions should attract the adoption and adaptation of a sustainable strategy for a tension-free and inclusive education approach. The said approach is value-driven and would help learners develop interest and learn how to succeed in society while proffering solutions to the world's problems. In fact, the pro-technology and pro-Internet generation group is actively compatible with videos and games. In order to balance the existing interface ecologically, their learning incorporated with similar tools would stimulate their interest better like in a homey space void of prejudice. That expected fascination counteracts their endangered mindset from the COVID-19 panic and naturally keeps them sensitive to lesson sections.

5. Conclusions

This paper highlighted virtual space as an effective pedagogical platform in contemporary education delivery in a COVID-19 era. Its fulcrum on the new and progressive educational paradigm attempt to satisfy the practical, functional, and social needs of the human society is unequivocal. At this juncture, this essay from the literature explored led to the deduction that, the unpreparedness of educational institutions and mythical perceptions about virtual education jeopardize possible trials of virtual learning. Based on these explanations, virtual space is an invaluable activity environment that is designed to foster student-centered learning theories, concepts, and approaches. It leverages collaborative learning to produce positive effects on the cognitive, affective, and psycho-motor faculties of learners through active involvement and role-

playing situation. A practical way of discovery-learning, which contributes to their dual achievement (passing a course and proffering remedy to community problems). In this participatory learning atmosphere and do-it-yourself strategy from start to the end of course content represent a pragmatic framework that other future researchers can harness constructively via empirical studies. The traditional teacher now functions as a facilitator who must upgrade with time to sustain relevance. This virtual hub with the guidance of the instructor as emphasized helps the learner find solutions to problems as a social construct, not just for grades. Considering the stated advantages, virtual space as instructional materials embedded with digital tools make the learning process undeniably tension-free, inclusive, and sustainable. Therefore, virtual space provides an effective approach to pedagogy in contemporary teaching and learning.

At the general considerations, virtual spaces in the future would need to incorporate some human design interaction criteria like mobility, flexibility, accessibility, and scalability to afford users anthropometric experience. That relativity perception would become a sustainable strategy for achieving a tension-free, inclusive, and reliable learning atmosphere. Those improvements would be engaging their senses at equitable levels. Virtual learning compatibility with some mobile phones and applications is already invoked but selective. The need to increase its compatibility character would remove the limitations of stationary PCs and aid collaborative, communicative, and effective teaching and learning at different educational climes. To satisfy these variables, virtual learning development and class success in a pandemic situation and in the future would require taking following recommendations into design heuristics, Table 2.

Table 2. Recommendations for Virtual Space Education

General Suggestions	**Specific Suggestions for Nigeria**
For asynchronous e-learning courses where learners are taking the course on their own, requisite components like communication forums, chat/messaging essentials should be engaged to create tutor-learner and community familiarity.	Curriculum designers, education administrators, educational technologist, and institutions of learning should come to a consensus on adapting educational operations to virtual learning framework as the world slide into the Post-COVID-19 pandemic era. Curricula redesign should include sustainable principles that would reform learning to suit contemporary demands.
Virtual space with open technology should connect diverse audio-visual	There should be preparedness and awareness in schools to mount studies via online learning platforms from the

resources and pedagogical approaches for the development of learners' complex solving abilities.	lessons learned from the COVID-19 contagion in order to surmount future pandemic recurrences impacts on education. With the resurgence of COVID-19 variants, schools should keep up their plans to prevent another close-down and coverup lost coursework of 2019/2020–2020/2021 Academic Sessions. To achieve these solutions, the adoption of virtual learning as an evidence-based approach remains a resilience denominator for schools.
Improve learners' engagement by incorporating a variety of formats in the lesson or coursework to meet their specific needs including interactive activities and discussions over content verbalization.	As part of infrastructural development, tertiary institutions should equip faculties with 21st-century instructional e-learning equipment to cope with modern trends that are stress-reducing and inclusive for all. Ministry of Education should intervene promptly through all-education-related agencies of government and the private sector.
Tutors should make a prior plan toward lesson structure/design to engage learners and let them know from the start what is obtainable at each point of the class session.	Institutions of learning should provide a variety of sustainable educational services to learners irrespective of their geographical location and social level through virtual learning platforms as it is the trending wave in education. However, clinical and internships components of courses should not be wiped out.
Make necessary provisions for support services in case they encounter difficulties, as well as some materials they can turn to for assistance where necessary.	More in-training of tutors and personnel on virtual education who would, in turn, instruct and manage its procedures should be mandated. Schools should bridge the gaps created by tutors who lost their lives to this virus and those that resign their jobs for fear of contracting the virus.
Tutors should manipulate lesson modules in a dynamic manner that spurs the spirit of sportsmanship. A flexible approach (open system)–allowing them to contribute to the grading process for compliance, reliability, and high-quality levels through the course duration.	Schools should develop partnerships with network providers and industries for the provision of cheap and discounted internet data packages and digital gadgets for their students' access to study tools which constitute the spine for exploring online-based learning.

Acknowledgement: The corresponding author appreciates the instructors of the course (GCC602-Education for Learning) at Near East University, North Cyprus for their multidisciplinary insight.

Funding: This study was not supported by any funding organization.

Declaration of Competing Interest: The authors declare that they have no conflict of interest.

References

[1] Crawford, J., Butler-Henderson, K., Rudolph, J. & Malkawi, B. 2020. COVID-19: 20 Countries' higher education intra-period digital pedagogy responses. *Journal of Applied Teaching and Learning*, 3, pp. 1–21.

[2] Pujari, D. R. 2020. Impact of CORONA virus on Indian education systems. *UGC Care Journal,* 31, 1–3.

[3] UNESCO 2020. *Distance Learning Solutions.* Paris: UNESCO.

[4] Vegas, E. 2020. School closures, government responses, and learning inequality around the world during COVID-19. Washington DC: The Brookings Institution.

[5] Tadesse, S., & Muluye, W. 2020. The Impact of COVID-19 Pandemic on education system in developing countries: A Review. *Open Journal of Social Sciences,* 8, pp. 159–170.

[6] Thomas, C. J. 2020. Coronavirus and challenging times for education in developing Countries. Washington DC: The Brookings Institution.

[7] Winthrop, R. 2020. COVID - 19 and school closures: What can countries learn from past emergencies? Washington DC: The Brookings Institution.

[8] Weller, Martin 2007. Virtual learning environment: using, choosing and developing your VLE. London: Routledge, pp. 4–5.

[9] Nikos A. 2017. Which trends are expected to dominate the workplace by 2020? Available at: https//www.efrontlearning.com/blog/2017/10/trends-workplace.html (Accessed: 30 August 2021).

[10] Selinger, M. 2001. Learning information and communications technology skills and the subject context of the learning. *Journal of Information Technology for Teacher Education,* 10(1–2), pp. 143–156.

[11] Ertmer, P. A., & Ottenbreit-Leftwich, A. T. 2010. Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. Journal of Research on Technology, 42(3), pp. 255–284.

[12] Zhu, X. D., & Liu, J. 2020. Education in and after Covid-19: Immediate responses and long-term visions. *Post digital Science and Education,* pp. 1–5.

[13] Chakraborty K, & Chatterjee M. 2020. Psychological impact of COVID-19 pandemic on general population in West Bengal: A cross sectional study. *Indian Journal of Psychiatry*, 23(62), pp. 266–72.

[14] Ibrahim, N. A., & Osman, K. 2017. Kesan Frog VLE secara pembelajaran koperatif terhadap pencapaian, KBAT dan minat pelajar bagi subjek Kimia. In Prosiding Seminar Pendidikan Transdisiplin UKM: Fakulti Pendidikan, Bangi, Malaysia, STeT 2017, pp. 635–649.

[15] Mishra, L., Gupta, T., & Shree, A. 2020. Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *International Journal of Education Research Open*, 1, 100012.

[16] Ray, S., & Srivastava, S. 2020. Virtualization of science education: a lesson from the COVID-19 pandemics. *Journal of Proteins and Proteomics,* 11 (2), pp. 1–4.

[17] Vasiliadou, R. 2020. Virtual laboratories during coronavirus (COVID-19) pandemic. *Biochemistry and Molecular Biology Education,* 48(5), pp. 482–483.

[18] Barajas, M., & Owen, M. 2000. Implementing virtual learning environments: Looking for holistic approach. *Educational Technology & Society*, 3(3), 39–53.

[19] Rheighold, C. 2004. The concept and the use of virtual learning environment in teaching: a literature reviews. Internal *Journal of Academic Research in Business and Social Science,* 8(6), pp. 1293-1301.

[20] Ojeniyi, A., Enegesele, D., & Obafunmiso, C. K. 2020. Factors militating against e-learning platform effective utilization during covid-19 pandemic. *International Journal of Computing and Technology,* 7(6), 66–71.

[21] Umar, B., Lukman, S., Adamu, L., Abubakar, I. 2020. Virtual Learning Environment: A Sustainable Alternative Strategy for Teaching Business Education amid Covid-19 Pandemic. *Journal of Science Technology and Education,* 8(4), pp. 146–161.

[22] Nawi, A., Hamzah, M. I., & Abdul Rahim, A. A. 2015. Teachers acceptance of mobile learning for teaching and learning in Islamic education: A preliminary study. *Turkish Journal of Distance Education,* 16(1), pp.184–192.

[23] Korićanin, E., Saračević, M., Biševac, E., & Kamberović, H. 2014. Concept and types of virtual environment: Research about positive impact on teaching and learning. *Unite Journal of Information Technology and Economics,* 1(1), pp. 51–57.

[24] Trafford, P., & Shirota, Y. 2011. An introduction to virtual learning environments. *Gakushuin Economic Paper,* 48(10), pp. 143–151.

[25] Piccoli, G., Ahmad, R., & Ives, B. 2001. Web-Based virtual learning environment: A research framework and a preliminary assessment of effectiveness in basic IT skills training. MIS Quarterly, 25(4), pp. 401–426.

[26] Abdullah, N., Noh, N. M., Yusuff, N. A. N., & Mansor, R. 2013. Aplikasi Persekitaran Pengajaran Maya (FROGVLE) dalam kalangan guru Sains. *Jurnal Pendidikan Sains & Matematik Malaysia,* 3(2), pp. 63–76.

[27] Shahaimi, S., & Khalid, F. 2016. Pengintegrasian Blended Learning dalam Pembelajaran Persekitaran Maya Frog (VLE FROG). In Pendidikan Abad Ke-21: Peranan Teknologi Maklumat dan Komunikasi serta Cabarannya. Fakulti Pendidikan, UKM. Selangor, Malaysia, hal. 52–71.

[28] Hamzah, M., & Yeop, M. A. 2016. Frog VLE (Persekitaran Pembelajaran Maya) dalam pengajarandan pembelajaran: Penerimaan dan kaedah pelaksanaannya. *Journal of Research, Policy & Practice of Teachers & Teacher Education,* 6(2), pp. 67–77.

[29] Yeop, M. A., Wong, K. T., & Goh, P. S. C. 2016. Blended learning: pedagogy, learning styles, assessment activities in the classroom. *International Journal of Advanced and Applied Sciences,* 3(11), pp. 36–39.

[30] Esbensen, F.A., & Carson, D. C. 2009. Consequences of being bullied: Results from a longitudinal assessment of bullying victimization in a multi-site sample of American students. *Youth & Society,* 41(2), pp. 209–233.

[31] Fekkes, M., Pijpers, F., Fredriks, A., Vogels, T., & Verloove-Vanhorick, S. 2006. Do bullied children get ill,or do ill children get bullied? A Prospective cohort study on the relationship between bullying and health-related symptoms. *PEDIATRICS,* 117(5), pp. 1568–1574.

[32] Sourander, A., Jensen, P., Ronning, J., & Niemela, S. 2007. What is the early adulthood outcome of boys who bully or are bullied in childhood? The Finnish “from a boy to a man” study. Official Journal of the American Academy of Pediatrics. 120, 397–404.

[33] Prawat, R. S., & Floden, R. E. 1994. Philosophical perspectives on constructivist Views of Learning. *Educational Psychology*, 29 (I), 37–48.

[34] Kate, M. 2020. Teachers' Essential Guide to Google Classroom. Available at: https://www.commonsense.org/education/users/katemcginnis (Accessed: 21 August 2021).

[35] Dixon. F. & Federico, J. n.d. BigBlueButton BN. Available at:https://moodle.org/plugins/mod_bigbluebuttonbn (Accessed: 21 August 2021).

[36] Basken, P. 2008. *Electronic portfolios may answer calls for more accountability*. The Chronicle of Higher Education.

[37] Rauf, H. L., Shareef, S. S., & Ukabi, E. 2019. Understanding the Relationship between Construction Courses and Design in Architectural Education. International Journal of Recent Technology and Engineering, 8(3), pp. 3201–3207.

[38] Nonis, D. 2005. "3D virtual learning environments (3D VLE)", Ministry of Education, Singapore 2005. Available at: http://www.moe.gov.sg/edumall/rd/litreview/3d_vle.pdf (Accessed: 30 August 2021).

[39] Dickey, M. D. 2003. Teaching in 3D: Affordance and constraints of 3D virtual worlds for synchronous distance learning. *Distance education*, 24(1), 105–121.

[40] Burton, B. 2008. Collaboration and the use of three dimensional interface within a virtual learning environment and the impact on communication and learning: a case study, Ph.D. Thesis, University of Missouri, Missouri, Columbia.

[41] Mintz, R., Litvak, S. & Yair, Y. 2001. 3-D virtual reality in science education: An implication for astronomy teaching. *Journal of Computer in Mathematics and Science Education*, 20(3), pp. 293–305.

[42] FameThemes. 2021. TutorRoom virtual classroom. OnePress. Available at: https://tutorroom.net/fr/classe-virtuelle/ (Accessed: 10 November 2021).

[43]SaaSworthy. 2021. Compare TutorRoom virtual classroom vs Learncube. Available at: https://www.saasworthy.com/compare/tutorroom-virtual-classroom-vs-learncube?pIds=6958,6959 (Accessed: 10 November 2021).

[44] Simon, N. 2020. *Using WhatsApp to enhance online learning.* African Edition, University World News. Available at:https://www.universityworldnews.com/post.php?story=20200421102812987 (Accessed: 10 November 2021).

[45] Robinson, L., Behi, O., Corcoran, A., Cowley, V., Cullinane, J., Martin, I., & Tomkinson, D. 2015. Evaluation of Whatsapp for promoting social presence in a first-year undergraduate radiography problem-based learning group. *Journal of Medical Imaging and Radiation Sciences*, 46(3), pp. 280–286.

[46] Tezer, M., Taşpolat, A., Sami, K., & Fatih, S. 2017. The impact of using social media on academic achievement and attitudes of prospective. *International Journal of Cognitive Research in Science, Engineering and Education*, 5(2), 75–81.

[47] Jaakkola1, E. 2020. Designing conceptual articles: four approaches. *AMS Review*, 10, pp. 18–26.

[48] Hirschheim, R. 2008. Some guidelines for the critical reviewing of conceptual papers. *Journal of the Association for Information Systems*, 9(8), pp. 432–441.

[49] Adams, R.D. 2020. Virtual schoolhouse: The best learning apps for online education this fall. TECHREPUBLIC. Available at:https://www.techrepublic.com/article/virtual (Accessed: 30 August 2021).

[50]Samuel, P. 2021. 15 Top Interactive E-Learning Web Apps for Online Classroom. Color Whistle. Available at: https://colorwhistle.com/top-e-learning-web-apps/ (Accessed: 30 August 2021).

[51] Sierra, R. 2021. Top of Form A look at virtual learning advantage and disadvantages. https://www.getapp.com/resources/virtual-learning-advantages-and-disadvantages/Bottom of Form (Accessed: 30 August 2021).

[52] Mustafa, N. 2020. Impact of the 2019-2020 Corona virus pandemic on education. *International Journal of Health Preferences Research*, pp.1–11.

[53] Devin, K. 2013. *USA today collegiate correspondent.* Available at: https://www.google.com/amp/s/amp.usatoday.com/ (Accessed: 30 August 2021).

[54] Lasssoued, Z., Alhendawi, M., Bashitialshaaer, R. 2020. Exploratory study of the obstacles for achieving quality in distance learning during the COVID-19 pandemic. *Education Science*, 10(9), 232.

[55] UNESCO 2020. *UNESCO rallies international organizations, civil society and private sector partners in a broad coalition to ensure Learning Never Stops.* Paris: UNESCO.

[56] UNESCO 2020. *Startling Digital Divides in Distance Learning Emerge.* Paris: UNESCO.