African Journal of
Education and Practice
(AJEP)

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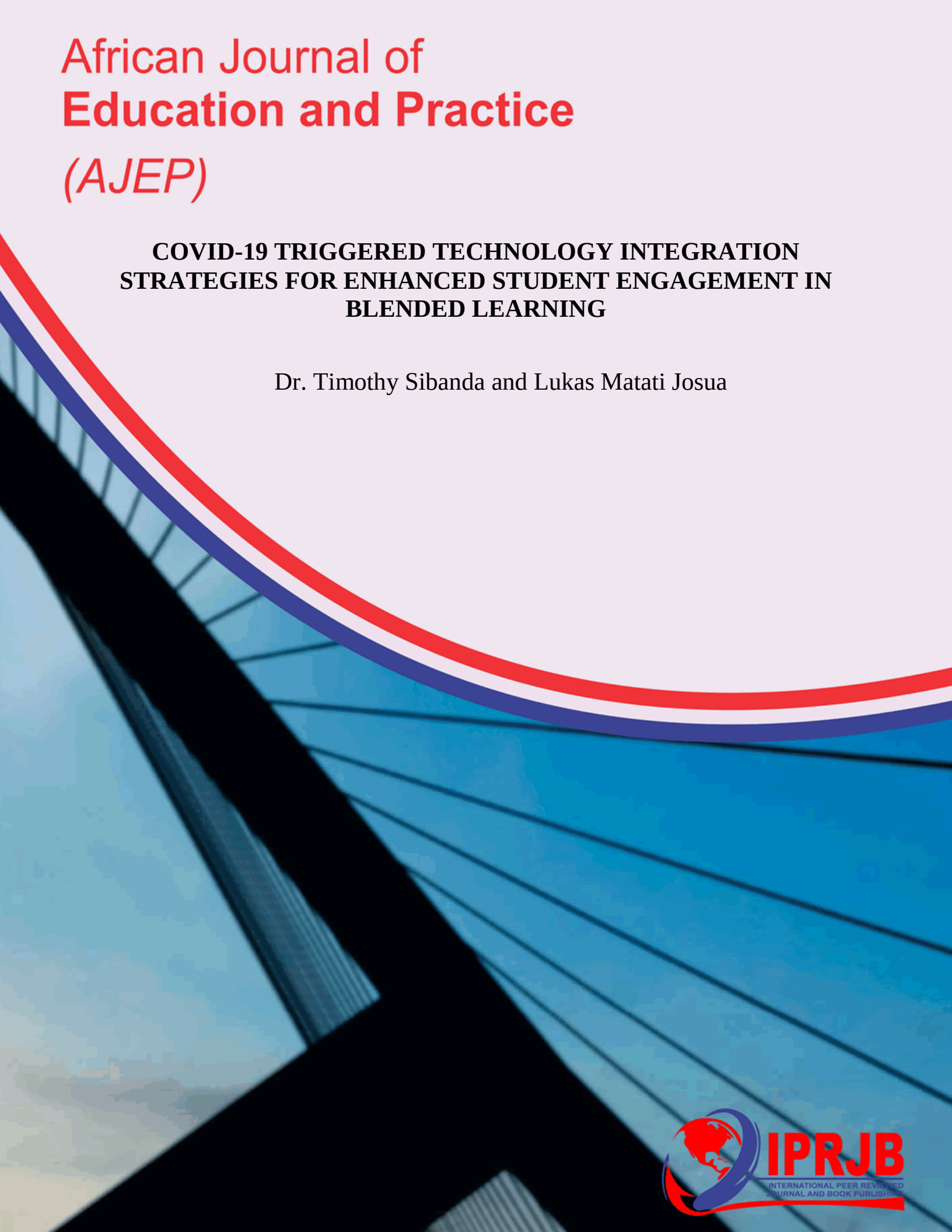

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

African Journal of Education and Practice
ISSN 2519-0296 (Online)
Vol.8, Issue 5, No.1, pp 1-18, 2022

www.iprjb.org

COVID-19 TRIGGERED TECHNOLOGY INTEGRATION STRATEGIES FOR ENHANCED STUDENT ENGAGEMENT IN BLENDED LEARNING

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Abstract

Purpose: This study reflects on three technology integration strategies for enhanced student engagement, namely; keeping the learning social, keeping the learning authentic, and ensuring that the technology adds value to learning.

Methodology: The study employed a student technology profiling survey involving 3rd Year Cell Molecular Biology, Microbiology and Genetics students at the University of Namibia in 2021. The survey used a Google Document whose link was distributed to students through class WhatsApp group. Further, literature is reviewed on student engagement, and blended learning. The data was qualitatively presented using graphs.

***Findings*:** The study revealed that keeping the learning social ensures learning from sociocultural perspectives, and allows for social constructivist methods of learning while the adoption of authentic learning as a pedagogical model can help to better prepare students for professional practice. Teachers can ensure that technology integration adds value by using instructional strategies that stimulate students into engaging with higher-level cognitive skills and differentiated learning. The study found that based on the nature of the course under review, we identified the Flipped Classroom model and the Enriched-Virtual model is most appropriate blended learning modes for full-time students and distance students, respectively.

***Unique contribution to theory, practice and policy*:** It is recommended that higher education institutions should consider redesigning their curriculum policies in order to integrate blended learning in all their courses in order to improve the quality of education, enhance student learning and engagement, as well as overall quality of the university graduates.

Keywords: *Higher Education; Student Engagement; Blended Learning; Technology Integration; Instructional Strategies; Life-long Learning*

INTRODUCTION

A balanced integration of technology in teaching, learning and assessment activities is required for rich blended learning experience that enhances student engagement, accommodates students' personal needs, and fosters life-long learning. Before the COVID-19 triggered turbulent changes in higher education, developed countries in the globe had experienced revolution resulting from marketisation, globalisation and revolution in information and communication technology (ICT) (Barnett, 2004). The ICT revolution continues to challenge the presence of geographical boundaries and distance. Digital divide was revealed in the wake of COVID-19 pandemic, which disrupted the social, cultural, economic and political environments around the globe. In order to contain the spread of COVID-19, educational institutions resorted to technology to ensure teaching, learning and assessment continues (Al-Ataby, 2020; Magesa & Josua, 2022).

Some studies conducted in developing countries in Africa such as Cameroon found that the use of modern educational technology to enable e-learning in higher education during COVID-19 had some pitfalls (Moluayonge, 2020). The was a lack of appropriate training interventions for teachers and learners. Other challenges unveiled are such as inconsistent power supply and poor internet connectivity. These challenges hamper smooth running of learning and teaching process in a higher education setting. Furthermore, in Ghana, Demuyakor (2021) posited that learners in Ghana were also faced with a number of challenges to access online learning platforms. In Namibia, challenges such as poor internet connectivity and lack of enabling devices (Magesa & Josua, 2022) impedes learning using online platforms during COVID-19 era. In addition, Magesa and Josua (2022) found that digital phobia among educators and students halted educational activities.

Student engagement is a key component of higher education which impacts on student satisfaction, in-depth learning, persistence, and academic success (Halverson & Graham, 2019; Heilporn, Lakhal, & Bélisle, 2021). On the contrary, when students are not engaged in their own learning, the result manifests in lack of motivation, high attrition rates, and low academic outcomes (Halverson & Graham, 2019). As a result, universities and university teachers are increasingly focusing their efforts on the design and implementation of more active and collaborative methods of teaching and learning in order to foster lifelong learning that better prepares learners for project/problem solving skills necessary for work places in the 4^{th} and 5^{th} Industrial Revolution (Jalinus, Verawardina, Krismadinata, Nabawi, & Darma, 2021; Wang, 2010). Enabling such efforts are the recent advances in information and communication technology (ICT) which are increasingly empowering universities and other higher education institutions (HEIs) to broaden the integration of online learning and teaching pedagogy into their curriculum, allowing for high-quality student-centric learning and teaching environments (Siraj & Maskari, 2018). Technology integration into HEIs' blended learning programmes complements changes in the higher education environment, and "changes in stakeholders' expectations for a more focused, student-centered teaching and learning environment" (Siraj & Maskari, 2018, p. 61).

While the traditional face-to-face, instructor-led and classroom-bound mode of instruction has for long been regarded as the 'gold standard' that is credited for offering full opportunities for interaction between lecturers and students, as well as among students (Milheim, 2006), it however places a requirement on students to be in the classroom on designated days and times, making it prone to disturbances arising from armed conflicts and/or natural disasters and disease pandemics

such as COVID-19 pandemic. To circumvent these and other limitations associated with face-to-face learning and teaching, educational institutions around the world adopted technology-enabled e-learning. This mode of learning is mostly computer based and utilises an integration of learning management systems (LMS) audio and video, supported by web course producers, designers, programmers, and pedagogical experts (Milheim, 2006). E-learning is characterised by being scalable, accessible, and timeliness (Clarke & Hermens, 2001). And, unlike the traditional face-to-face mode of learning where an instructor can only be available to a limited number of learners at a time, e-learning delivery can either be synchronous, with participants logged on together in virtual classrooms in real time, or asynchronous, wherein learning is self-paced and taken via the internet (Clarke & Hermens, 2001).

However, exclusive dependency on e-learning has its own limitations. Depending on the types of e-learning and how the e-learning is designed, these may include poorly created or inconsistent course contents, the absence of a deadline pressure on assignments submissions which tends to lower learning efficiency, and the inability of students to do hands-on practical learning in the case of technical subjects (Fong & Wang, 2007). As both the traditional classroom learning and e-learning simultaneously offer strengths and suffer from limitations, educational innovation has responded by combining the strengths of the two modes into a new mode called blended learning. This has brought with it the need to delicately strike a balance in the integration of technology to educational pedagogy for the creation of a rewarding blended learning experience that enhances student engagement, accommodates students' personal needs, and fosters life-long learning. Therefore, the of this paper is to reflect on three technology integration strategies for enhanced student engagement, namely; keeping the learning social, keeping the learning authentic, and ensuring that the technology adds value to learning.

Research objectives

The paper is based on the following objectives:

1) To develop a suitable blended learning model(s) for the course in an institution of higher education.
2) To propose effective technology intervention strategies to enhance student engagement in a blended learning environment.

METHODOLOGY

This paper is based on the analysis of results that are generated from a student technology profiling survey involving 3rd Year Cell Molecular Biology, Microbiology and Genetics students at the University of Namibia in 2021. This course is offered in the First Semester, and comprises of both 'full-time' and 'distance' students. The course also comprises of a theory component as well as a practical component where students are required to be in the laboratory for their laboratory-based learning and assessments. The survey was carried out online using a Google Document whose link was distributed to students via the class WhatsApp group. The survey results were used to develop a suitable blended learning model(s) for these courses as well as propose effective technology intervention strategies to enhance student engagement in a blended learning environment.

The paper further reviewed literatures pertaining to two critical components of this paper, namely; student engagement, and blended learning. Thereafter, the results of the survey, followed by a discussion of the suitable blended learning mode(s) as well as what is perceived to be pragmatic technology integration strategies for enhanced student engagement in blended learning, based on the above described survey are presented.

LITERATURE REVIEW

Student engagement

Student engagement has been defined as the "degree of attention, effort, participation curiosity, interest and passion shown by students when they are learning or being taught" (Chiu, 2021, p. 2), and is considered to include the student's "cognitive, emotional and behavioral reactions to the teaching and learning process, both inside and outside the classroom to achieve maximum learning outcomes" (Setiyani, Harnanik, Lianingsih, & Susilowati, 2020, p. 397-398). According to various authors as cited by Chiu (2021, p. 2), behavioural engagement refers to "students' participation and involvement learning activities", whereas emotional engagement "comprises students' affective reactions to their classmates, teachers, learning activities, and school, especially discrete emotions such as happiness, excitement, boredom, and anxiety", and cognitive engagement refers to "students' mental effort to complete tasks using a deep, self-regulated, and strategic approach to learning, rather than superficial learning strategies". Wholesome student engagement therefore goes beyond just student involvement and participation, but also includes students' affections and cognition. Student engagement has been observed to increase when students are exposed to technology aided learning (Nehme, Seakhoa-King, & Ali, 2015; Siraj & Maskari, 2018) as well as by teachers making use of instructional design strategies as well as learning and teaching approaches that respond to the students' emotional, cognitive and behavioural aspects (Chiu, 2021; Delialioğlu, 2012; Siraj & Maskari, 2018), especially tasks that elicit active and collaborative learning. Delialioğlu (2012) observed that,

> …problem-based blended learning environment has more power to engage students with meaningful learning activities; therefore, using this learning approach will increase students' engagement with meaningful academic activities. Second, regardless of students' individual factors, all students engage with academically meaningful activities equally well in the problem-based environment (p. 320). Students should be active participants while taking central role in learning and knowledge creation, which could be enabled through various technology platforms.

This implies that whatever technology integration strategies, instructional design should gravitate more towards active learning rather than lecture method which fosters passivity among students.

Blended Learning: Technology Enhanced Student Engagement

One of the greatest leaps lecturers have ever made towards realising meaningful progress in student engagement is through the use of blended learning methods (Setiyani et al., 2020). Blended learning has been defined as a formal educational strategy in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, pace, path, and/or place, and in part through traditional face-to-face instruction in a brick-and-mortar location away from home (Kim, 2013; Min & Wu, 2017; Staker & Horn, 2012). Blended

instruction offers meaningful learning experiences through diverse delivery methods that significantly enhance learning outcomes, as well as increase student satisfaction from the learning experience (Lim & Morris, 2009). To a large extent, the success and functionality of blended learning is dependent on a number of factors which include a combination of instructional delivery media and instructional methods, and students and teachers' mastery of technology (Dewi, Ciptayani, Surjono, & Priyanto, 2018). Staker and Horn (2012) are largely accredited for proposing four blended learning models (see **Figure 1**).

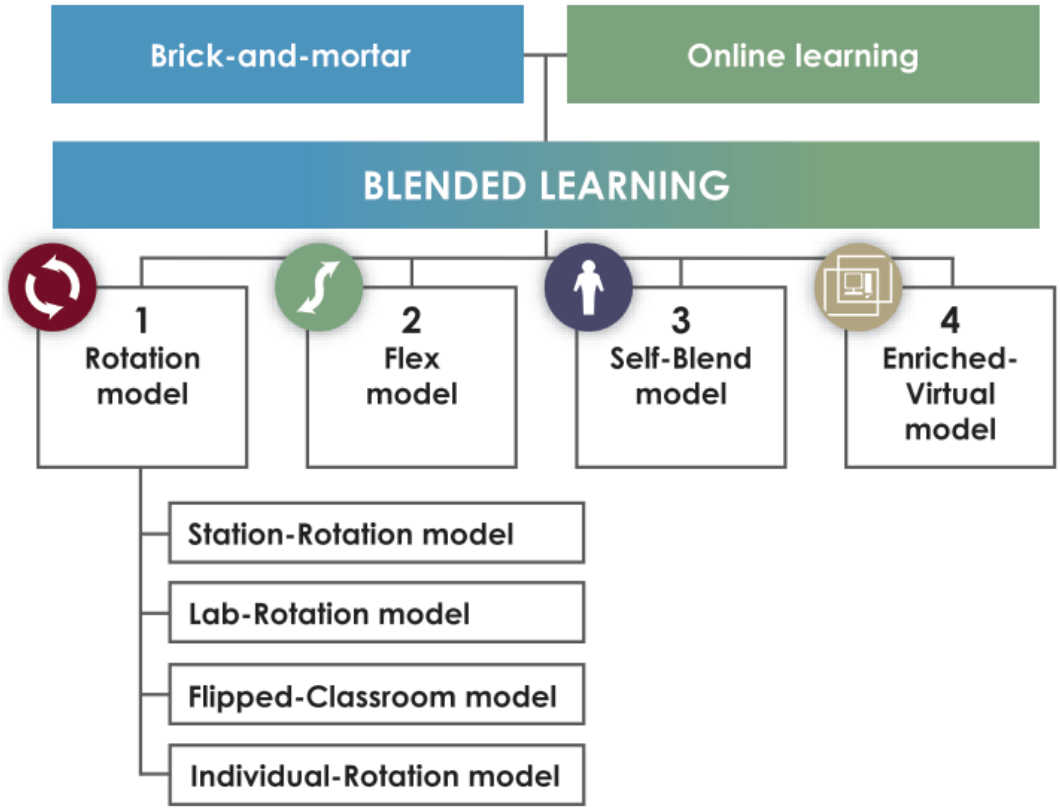

Figure 1: Blended learning taxonomy and models. Adopted from Staker and Horn (2012), Copyright 2012 by Innosight Institute, Inc.

While the models were proposed specifically for the k-12 learners and teachers, they are still very much applicable to higher education settings (Jalinus et al., 2021; Nurkamto, Mujiyanto, & Yuliasri, 2019). The models are sufficiently described in Staker and Horn (2012).

While almost all modes of learning have their pros and cons, the advantage with blended learning is that "it integrates technology and online learning materials with traditional face-to-face classroom activities" (Chiu, 2021). It is premised on the strengths of both the traditional face-to-face mode and a purely e-learning experience (Siraj & Maskari, 2018). In that regard, part of the arsenal that exclusive e-learning brings into the blended learning experience include its high compatible with the ethos of social constructivism (Wang, 2010). The argument is that it promotes the manner in which learners actively construct their knowledge on the basis of what they already know through social interaction in learning contexts, as opposed to passively receiving knowledge

in pre-packaged form. Further, Levy and Kennedy (2004) as well as Loewen and Erlam (2006) argue that both synchronous and asynchronous e-learning modes facilitate learner-centred learning, promote critical thinking, enhance knowledge construction, and create collaborative learning communities. This point of view is congruent to that of Ng and Cheung (2007) who assert that learner-centred online discussion forums facilitate learners' construction of knowledge by providing the requisite environment for the social negotiation of meaning. According to Pawan, Paulus, Yalcin and Chang (2003), the asynchronous mode of e-learning also provides learners with more time to think and edit, while Althaus (1997) argues that learners involved in online discussions create more thoughtful responses because they have more time to process input, and to reflect on what they want to express.

Blended learning strategies attempt to amplify these e-learning strengths, and those of face-to-face learning environment, while making effort to minimise their weaknesses. For example, students may be more creative and sophisticated while completing tasks online than they ever could be using pen and paper (Blake, 2005; Kern, 1995). Again, Chen and Looi (2007) and Ng and Cheung (2007) observed that blended learning integrates online discussion into the flow of classroom instruction, thereby providing learners with ample time to foster habits of critical thinking, reflection, and articulation of their viewpoints, which can subsequently promote further in class oral discussions or outside class online discussions. For its success, interaction is of equal importance in both face-to-face and online environments. Ginns and Ellis (2009) posit that the blended learning experience provides a mix of both online and face to face experiences which support each other in achieving desired learning outcomes. Thus, formulating a blended learning strategy requires relating the online learning context, such as online activities and discussions, to the whole of the student experience, including the totality of both online and face to face learning experiences (Wang, 2010). In light of the literature reviewed, a student technology profile is generated based on the following factors: students' digital literacy skills, students' technology access at school and home, and students' technology use in terms of what technology tools, software and apps they use. The results are used to propose the most suitable blended learning mode(s) for this course, as well as to develop suitable technology intervention strategies to enhance student learning or improve teaching in a blended learning strategy.

The literature reviewed focused on student engagement (Chiu, 2021; Nehme et al., 2015; Siraj & Maskari, 2018). Furthermore, studies that focused on use of digital technology for blended learning. This specific study addresses the gap related to COVID-19 triggered technology integration strategies to enable epistemic access to students. This requires stakeholders to review structures such as policies, regulatory bodies to make them responsive to contemporary changes in the environment.

RESULTS

Student Technology Profiling Results

Whereas the survey was administered to 33 students, 20 students (60.6%) responded to the survey. Upon collating student responses to the survey, it was noticed that regardless of location (whether city or rural area), gender, and/or age, all students owned a smartphone. An additional 45.5% owned a laptop computer, in addition to a smart phone. Additionally, it was observed that 100%

of the students could make calls, send texts, send email, download and upload information online, and use messaging apps, though at varying frequencies as shown in **Figure 2**.

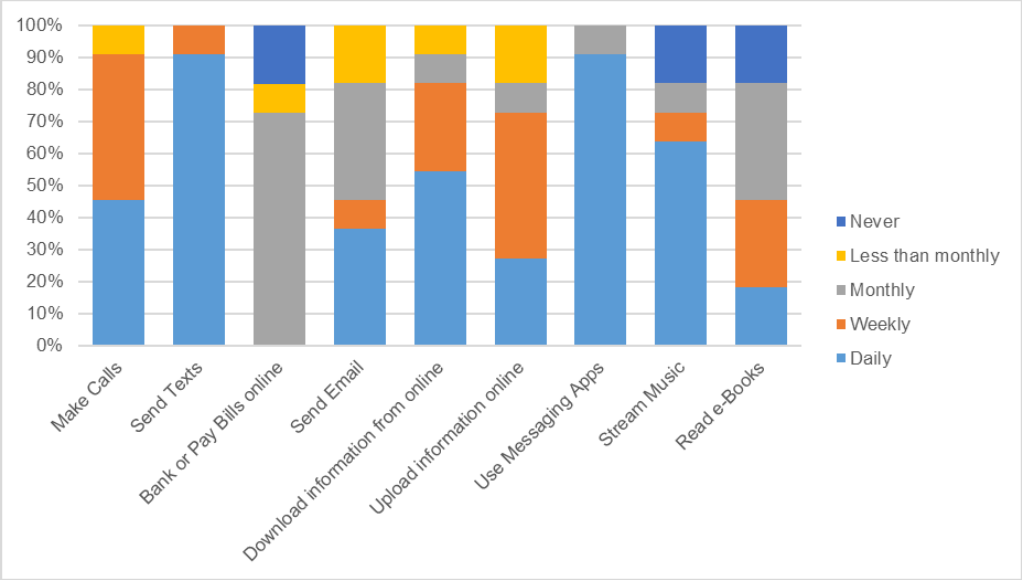

Figure 2: Students' digital literacy skills

On assessing the students' learning-related habits, again it was observed that 100% of the students could use the web for their research, use word processing for writing assignments, use digital devices to submit assignments, use email and WhatsApp to communicate with their lecturer as well as with peers, of course with varying frequencies, as shown in **Figure 3**.

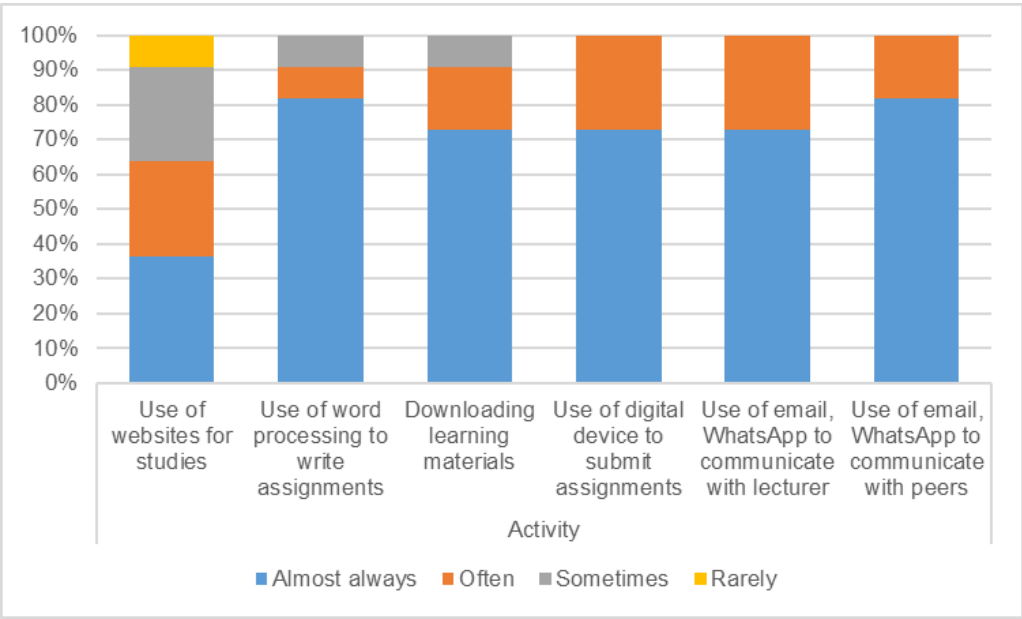

Figure 3: Students' use of technology in learning related activities

Data presented in **Figure 4** and **Figure 5** shows that all student had access to the internet and social media, and could contact their lecturer as well as their peers using various digital platforms, mostly according to preference rather than lack of access.

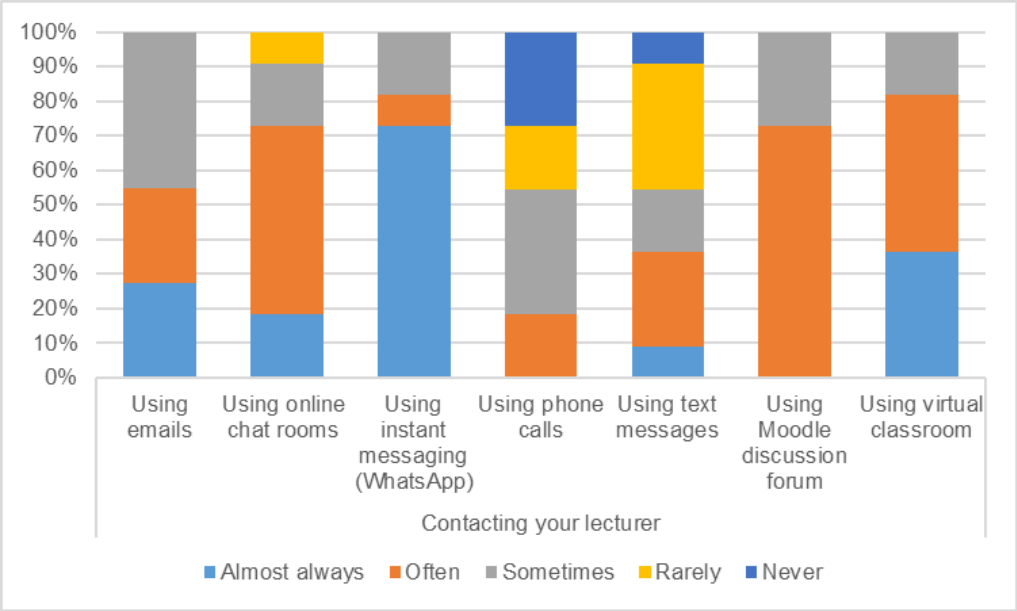

Figure 4: Students' preferred means of contacting their lecturer using various digital platforms

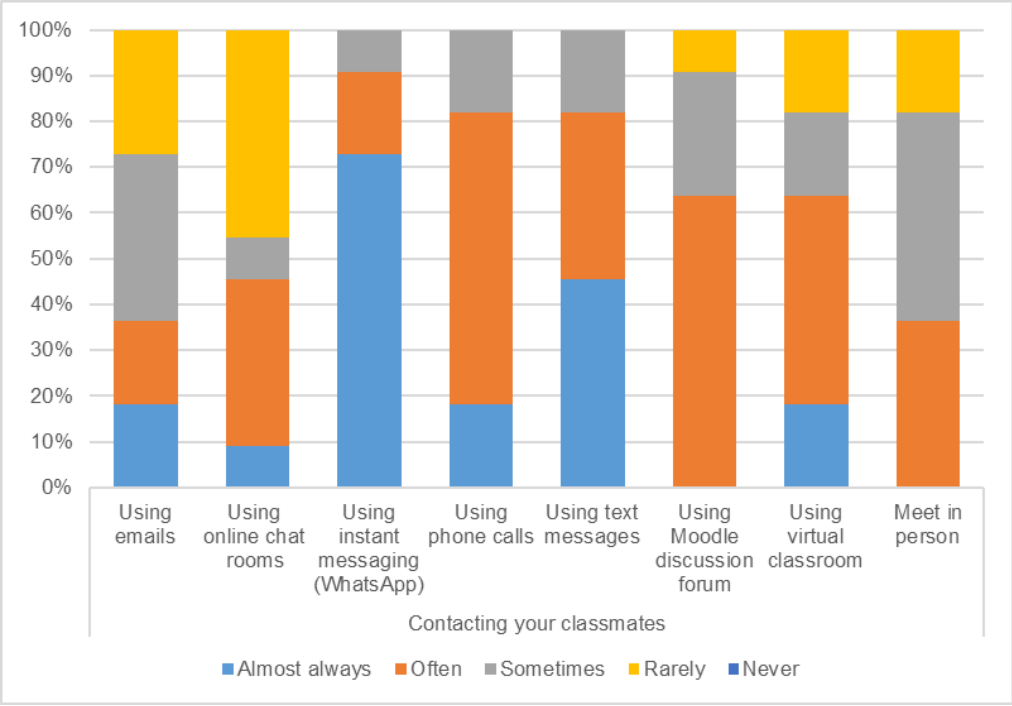

Figure 5: Students' preferred means of contacting their peers using various digital platforms

On learning and assessment mode preferences, data in **Figure 6** shows that as much as 54% of students preferred blended learning approach while 37% preferred online learning and the rest face-to-face learning. All respondents (100%) preferred online assignments while 91% preferred to have their examinations written online compared to about 10% who preferred a pen and paper approach. The same applied to test writing preferences. Students' varied preferences between online and face-to-face learning and assessments justifies the call for blended learning as the only learning mode that can offer both worlds of learning to students, thereby meeting students' individual needs.

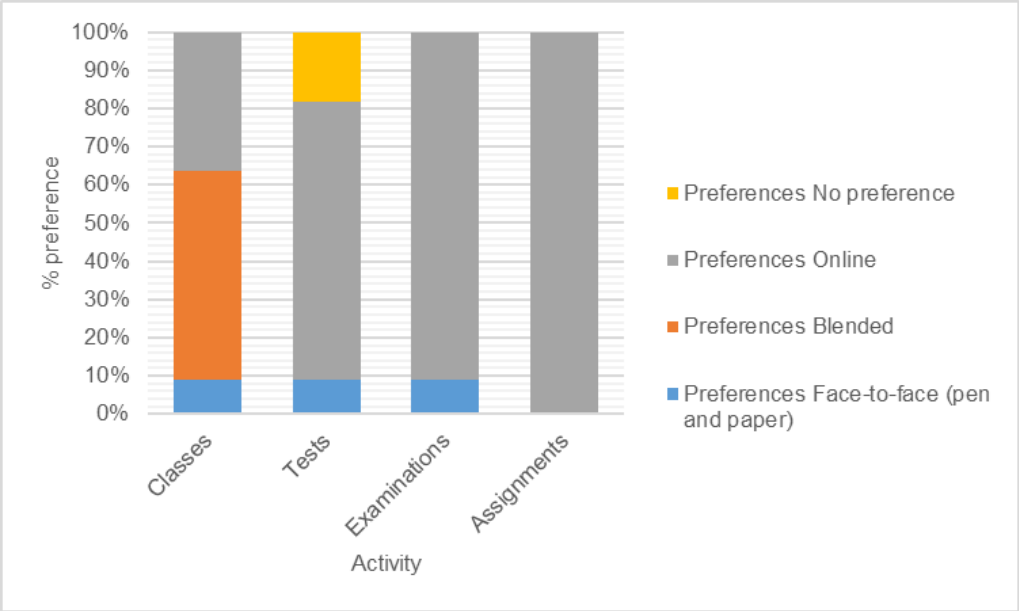

Figure 6: Students' learning and assessment mode preferences

Table 1 shows the questions that students were asked with the intention to enhance their online learning experience, and how they responded. The responses were thematically grouped so that those with the same idea were grouped together.

Table 1: Students' recommendations for an enhanced e-learning experience

Questions	Responses (% frequency)					
What kind of improvements would you like the university to make regarding online learning?	*Use platform such as Microsoft Teams, which allow for more people to join the class* **(36.1%)**	*The network is so bad, when we are writing tests and exams, at least the time must be enough because the network use to be trapping* **(9.1%)**	*Give all students pocket Wi-Fi not only the first years and provide more data* **(18.2%)**	*The university should load students with more databases, at least 15GB per month. The E-learning platform should be updated to be able to accommodate more than 500 students at a time* **(18.2%)**	*So far so good* **(18.2%)**	*To allow lecturers teach students online* **(18.2%)**
What kind of improvements would you like your lecturer to make regarding online teaching?	*Upload the recorded lessons on WhatsApp* **(27.3%)**	*Use platform such as Microsoft Teams, which allow for more people to join the class* **(9.1%)**	*Notify us for everything happening, through WhatsApp groups* **(9.1%)**	*So far, the lecturer is good, and keeps us updated on everything that concerns student learning, so there are no complaints at the moment* **(45.4%)**	*Provide test after every unit* **(9.1%)**	
What other comments do you have on use of technology in learning and teaching?	*All platforms must work efficiently It's fine* **(9.1%)**	*All is well at the moment, the ones in remote areas should be encouraged to come closer to where there is better network* **(9.1%)**	*Technology in our learning helps us to find more information about a certain topic on our own* **(9.1%)**	*Students should all be provided with more mobile data and also given portable Wi-Fi* **(9.1%)**	*To reduce the charging of a lot of data's for any school related websites* **(9.1%)**	*None* **(54.5%)**

DISCUSSION

Blended Learning Model

The students' technological profiles showed that they all had sufficient access to technological gadgets, and to internet services. Most importantly, all the students were sufficiently skilled in the use of digital technology, and could use their skills for educational purposes. In addition, the majority of the students preferred blended (54%) and online learning (36%), with 10% of the students preferring the face-to-face mode of instruction. Therefore, adopting a blended learning approach would cater for the needs of all students, more so given the fact that the course in question has both a laboratory-bound practical learning and a classroom-centred theory aspect. Based on these observations, it is determined that the two most suitable blended learning models for Cell Molecular Biology are the Flipped Classroom model (**Figure 7a**) for the full-time students while the Enriched-Virtual model (**Figure 7b**) is most appropriate for the distance students. According to Staker and Horn (2012), the Flipped Classroom is a sub-category of the Rotation-model in which within a subject, say Cell Molecular Biology, Microbiology and Genetics in this case;

> Students rotate *on a fixed schedule* between face-to-face teacher-guided practice (or projects) on campus during the standard school day and online delivery of content and instruction of the same subject from a remote location (often home) after school. The primary delivery of content and instruction is online, which differentiates a Flipped

> Classroom from students who are merely doing homework practice online at night. The Flipped-Classroom model accords with the idea that blended learning includes some element of student control over time, place, path, and/or pace because the model allows students to choose the location where they receive content and instruction online and to control the pace at which they move through the online elements (p. 10-11).

However, in the case of Cell Molecular Biology, Microbiology and Genetics, a slight modification of the model would require that students be on campus on particular days of the week (say Thursdays from 09H00 to 12H00) for their laboratory based practical projects while content and instruction is delivered online during the other days of the week instead of requiring students to be *on campus during the standard school day* with *online delivery of content and instruction of the same subject from a remote location (often home) after school*. On the other hand, they describe the Enriched-Virtual model as;

> A whole-school experience in which within each course *(again Cell Molecular Biology holds as an example here)*, students divide their time between attending a brick-and-mortar campus and learning remotely using online delivery of content and instruction. Many Enriched-Virtual programs began as full-time online schools and then developed blended programs to provide students with brick-and-mortar school experiences. The Enriched-Virtual model differs from the Flipped Classroom because in Enriched-Virtual programs, students seldom attend the brick-and-mortar campus every weekday. It differs from the Self-Blend model because it is a whole-school experience, not a course-by-course model (p. 15).

The Enriched-Virtual model would enable distance students to undertake their laboratory-based practical projects, which are usually spread over a week towards the end of the school semester.

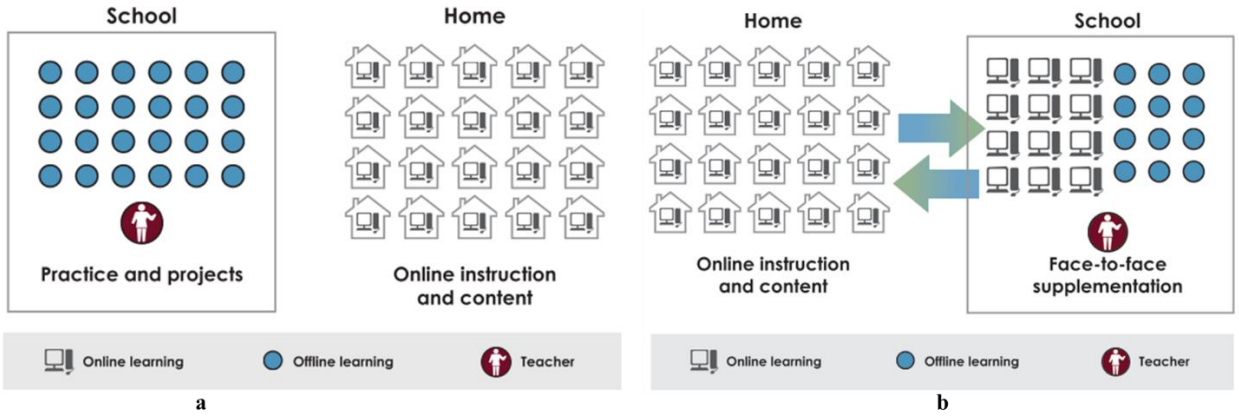

Figure 7: (a) Flipped Classroom, and (b) Enriched-Virtual Classroom blended learning models. Adopted from Staker and Horn (2012), Copyright 2012 by Innosight Institute, Inc.

Technology Integration Strategies for Enhanced Student Engagement

The following technology assisted instructional designs are proposed, namely; keeping the learning social, keeping the learning authentic, and ensuring that the technology adds value to

learning. In proposing these strategies, the role of the lecturer as that of encouraging learning by facilitation, and coordinating the co-creation of understanding with learners and between learners is considered. Setiyani et al. (2020) argue that this way,

> Educators build learners into the curriculum design by giving learners control over parts of their learning environment; this includes creating learning-oriented assessment designs. This requires setting up the conditions such as the group, technology or blend, and to design learning activities which are divisible by the number of group members, and are interdependent which means each group member has a structured job to do and is more likely to encourage individuals to actively engage with learning (p. 389).

The proposed technology integration strategies are based on the arguments raised above, chiefly those concerned with ensuring that each student plays a meaningful part in own learning, and in the learning of others, as further discussed below.

Keeping the learning social

Having noted from the student technology survey results that students almost always use their social media apps for constant communication with each other concerning their school work, it is considered befitting that any technology integration strategy should be designed in such a way that it keeps the learning social for enhanced student engagement. Such interactive approaches to learning have been shown to improve student engagement (Nehme et al., 2015). It is proposed that students will have face-to-face instruction only when they are undertaking laboratory-based practical learning, while the theoretical content will be delivered online. It is further argued that the teacher's duty, as a facilitator of learning, will be to ensure that this online learning component is not robbed of social interaction by creating an interactive learning environment. The teacher can achieve this by effectively using Moodle Learning Management System (LMS) to host live, synchronous online classroom sessions that allow students to have two-way conversations about what they are doing and learning. The use of Moodle, despite some accessibility shortcomings, has shown to increase student participation in learning, as well as in exchanging ideas and knowledge (Siraj & Maskari, 2018).

It is also incumbent upon the teacher to guide students into the employment of e-tools for formal learning activities and provide them with the required support to master the competencies governing effective and collaborative online learning. Moreover, to ensure e-learning from sociocultural perspectives, the teacher should take care of pedagogical techniques such as group learning and constantly guide students for effective interaction (Pawan et al., 2003). Encouraging interaction among students in online platforms has been observed to help them apply and integrate newly gained knowledge in the course of engaging in group activity (Wang, 2010). An example of such group activities is the 'break-away rooms' concept which allow for social constructivist methods of learning where a teacher may use an enquiry-based method for example, and then divide students into groups to solve the given tasks. Such strategies will support students and teachers in working together on meaning creation, and providing feedback in real time.

Another strategy could be the use of Google Docs either to write an assignment or to debate on a topic. Using this approach, students may take full advantage of the synchronicity of Google Docs by editing each other's work and giving real-time feedback with the comment feature. This allows the students to share in each other's learning by engaging social constructivist processes via

technology. Already, the profiling results of this survey have shown that students do have means to contact each other as well as to contact their lecturer. Technologies whose frequency of use among students overlap can be chosen for learning purposes.

Ensuring that the technology adds value

Technology is effective when it adds value to the lesson by enhancing the learning in ways that could not easily be done without technology. For example, a theoretical explanation of an otherwise practical-based concept (e.g., Sanger sequencing) is usually complemented by playing videos from JoVE Science Education or JoVE Lab Manual, and indeed sometimes YouTube, for visually and auditory emphasising the concept in an online class. This has been reported to cater to students' diverse learning styles (Delialioğlu, 2012; Sahni, 2019). It has been observed that, almost always, students appreciate the use of technology in making audio-visual presentations of theoretical concepts that they have always found difficult to understand without technology. Additionally, software that helps students elicit higher-level thinking tends to be more beneficial for cognitive development and growth. Teachers can therefore ensure that technology integration adds value by using instructional strategies that stimulate students into engaging with higher-level cognitive skills and differentiated learning, such as asking probing questions, or asking students to do reflective notebooks. By so doing, students may increase their metacognitive awareness of the learning process and strategise ways to achieve the pedagogical goals of the tasks assigned (Wang, 2010).

Make the learning authentic

According to multiple authors (Herrington, 2006; Karagiorgi & Symeou, 2005; Wornyo, Klu, & Motlhaka, 2018), authentic learning occurs when instruction is designed to facilitate, simulate and recreate real-life complexities and occurrences with the overall purpose of improving student engagement and educational outcomes. Wornyo et al. (2018) further explain authentic learning as learning that "reflects how we go through life experiences by utilizing our knowledge and experiences to decide the steps or actions that we have to take on the spot" (p. 56). Still on the same argument, Bozalek et al. (2013) posit that "…the adoption of authentic learning as a pedagogical model can help to better prepare students for professional practice".

Based on the forgoing arguments, teachers must find ways of integrating technology into the learning process to ensure that learning is situated in real-world experiences. An example includes teachers bringing real-world learning with technology into the classroom by using applications that allow students to learn with others outside the classroom. Zoom for example, can be used to take students on virtual trips to industrial sites where industry experts can help students in their project-based learning activities, or asking students to come up with what they want to learn based on their life experiences.

CONCLUSION

Experiences gathered from teaching and learning during COVID-19 enforced lockdowns show that blended learning may soon become the dominant mode of instruction the world over. For enhanced student learning, it is important that teachers know their students' digital technological profiles in terms of access and literacy, the suitable blended learning model to use, as well as how to integrate technology into blended learning in a way that both facilitates and enhances student

learning. The quality of learning will largely depend on the use of instructional strategies that apply Vygotskian principles of social constructivism during the learning process.

Before the outbreak of the COVID-19 pandemic, and simultaneously, before the Postgraduate Diploma in Higher Education (PDHE), most teachers have little experience with online teaching, let alone blended learning. During this time, teaching approaches of some academics were solely based on a face-to-face pedagogy, which was largely behaviouristic in nature. Upon transiting from the face-to-face mode of learning and teaching to the online mode, teachers struggled to design teaching approaches that would keep students engaged. Sometimes academics would 'lecture' by just read through the slides, with an occasional "Do you understand", or "Are we together?" or "Any question?" remark thrown at the end of each slide. One could not figure out how to use collaborative teaching approach online. The challenges did not end there, they spilled over into assessments where the usual 'regurgitative' question design suddenly seemed 'not to work' as the majority of students suddenly started consistently scoring 100% in tests, including those students 'who belonged to the lower tier'. This performance had been blamed on the students' use of the internet in assessments, that they 'google searched' for the answers. When students were consistently absent from class, the blame was on their disinterest in actual learning, and on their banking on possible copying come examination time. This requires self-reflection on one's own teaching approaches, whether the instructional designs employed were engaging or not. That is why it is urged for every teacher to get some training on the use of various online pedagogies, as well as on the proficient use of technology in learning and teaching.

Training on higher education teaching enable understanding that both the students' eagerness and ability to use the internet is a tremendous advantage that a teacher with knowledge of online pedagogy can harness for both active and authentic learning. All the institutional structures, cultures and agencies should create an enabling online environment, as well as guide the students' technological skills and access into purposeful engagement with course content and learning outcomes. Additionally, students' access to and proficient use of information and communication technology (ICT) should be viewed as an advantage for the implementation of blended learning. Among the numerous advantages of blended learning as already discussed, it affords the students both the opportunity for active and collaborative technology-aided online learning as well as the opportunity for performing hands-on laboratory activities with their peers and the instructor. Appropriate technology integration strategies should be embraced as means for fostering life-long learning among students, as well as a means for producing market ready graduates. The combination of appropriate technology integration strategies and a suitable blended learning mode is likely to give students the choice of path, place and pace, as well as making courses to become more student-centric, and better engaging. This paper concludes by proposing that the University of Namibia and other higher education institutions should consider redesigning their curricula in order to integrate blended learning into all their courses in order to improve the quality of education, enhance student learning and engagement, as well as overall quality of the university graduate.

RECOMMENDATIONS

In line with revelation from the reflections on this paper, some recommendations are made, namely:

- It is recommended that the University of Namibia should introduced varied online platforms such as Microsoft Teams, which allow for more people to join the class.
- It is further recommended that the University of Namibia should be provided with Pocket Wi-Fi devices as well as load students with more databases every semester to enable then to easily access e-learning platforms.
- It is recommended that stakeholders in high education should be compelled by policy to avail network access everywhere in the country to ensure equal as well as equitable access to high education.
- It is recommended that every student and teacher should go through mandatory training on the use of various online pedagogies, as well as on the proficient use of technology in learning and teaching.
- It is recommended that higher education institutions should consider redesigning their curricula in order to integrate blended learning in all their courses in order to improve the quality of education, enhance student learning and engagement, as well as overall quality of the university graduate.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

Authors' contributions

TS conducted the survey through student profiling in the Postgraduate Diploma in Higher Education under the mentorship of LMJ. All authors contributed to and finalised the paper.

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