

# Education 5.0 in the face of Covid-19: Zimbabwe higher education institutions' response – 2 years on

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## **Abstract**

The post-Covid-19 pandemic pedagogy has seen institutions transitioning to a blend of online, remote, and face-to-face teaching against the demands of the Education 5.0 heritage-based higher education philosophy. The purpose of the study was to explore how the implementation of the Education 5.0 philosophy was disrupted by the Covid-19 pandemic-induced university closure and the responses of the higher education institutions (HEI) in Zimbabwe to contain the spread of the Coronavirus and their preparedness to transition to blended learning, in the face of the demands of the Education 5.0 philosophy. The study employed a qualitative approach that was underpinned by a phenomenological research design. Purposive sampling was used to collect data using online semi-structured interviews from a sample of 15 key informants drawn from three HEI in Zimbabwe. The study found out that, while there was an initial haphazard and uncoordinated response to the loss of learning time due to institutional closure, the transition to online, remote and distance learning proved difficult with the challenges associated with blended learning with online learning from home persisting to the present day. Teaching staff lagged in the use of technological gadgets for online learning, students, and lecturers experienced network challenges as well as the cost of accessing learning content online. As such, the dictates of Education 5.0 especially industrialisation and innovation could not be fully implemented due to online instruction. The study concludes that the Covid-19 pandemic hurt the implementation of the Education 5.0 philosophy in HEI in Zimbabwe. The study recommends that blended learning be strengthened. Innovation and industrialisation activities must be accelerated to ensure that there is a positive impact on the economy and society at large.

Keywords: Education 5.0; Covid-19; Innovation; Industrialisation; higher education (HE); higher education institutions (HEI)

## **Introduction**

More than two years after the first cases of Covid-19 were recorded, 514 million people have contracted the virus and 6.24 million deaths have been recorded the world over since then (John Hopkins University, 2022). In Zimbabwe, 248,000 cases with 5,496 deaths were recorded (Ministry of Health and Child Care (MOHCC), 2022). Besides the huge death toll, the world has been affected economically and socially by the pandemic over the past two years (Jensen, Marinoni, & van't Land, 2022), with far-reaching disruptions to the socio-economic and cultural system of society. The education system has been greatly disrupted by the Covid-19 pandemic the world over (Somabut & Tuamsuk, 2021).

In respect of education, due to school and higher education institutions (HEI) closures (Beans, Maireva & Muza, 2020; Mandikiana, 2020), university management, staff and students remain faced with continuing challenges to address as a result of the pandemic, but also there are new opportunities to be explored (Jensen, et al., 2021; Alonso-Zaldivar, Burns, and Fox, 2020). Contextually, the environment in which HEI operate remains largely unpredictable, placing demands on the sector to come up with innovative and flexible alternatives to fulfil their mandate.

The Covid-19 pandemic has re-ignited and quickened change, especially in the HEI landscape, as it has done in the rest of the economy (Macheka, Taru, & Sibanda, 2022; Jensen, et al., 2021; Keche, 2021; Beans, et al., 2020). Resultantly, higher education (HE) must be re-imagined to better fulfil societal expectations. Thus, the current status quo requires in-depth reflections on how to 'build back better'.

The Covid-19 pandemic brought new dimensions to HE pedagogy, with blended, online and remote teaching being a key response by many HEI in most parts of the world (Somabut & Tuamsuk, 2021; Kachintorn, 2020; Edwards, 2012). While distance and online learning are

not new concepts to HE (Kentnor, 2015), the scale and extent to which they were adopted by HEI the world over as a mitigatory measure to college and university closure were enormous.

While Covid-19 has accelerated change in the overall economy in general and higher education in particular, and in the face of the need to modernise and industrialise the economy, the Government of Zimbabwe through the Second Republic abandoned the Education 3.0 philosophy which was underpinned by three pillars: teaching, research and community engagement (Muzira & Bondai, 2021), for the Education 5.0 heritage-based philosophy which emphasises the five pillars namely teaching, research, community engagement, innovation and industrialisation (Keche, 2021; Muzira & Bondai, 2021; Ministry of Higher and Tertiary Education, Science and Technology Development (MHTESTD, 2018)). The implementation of the Education 5.0 philosophy coincided with and was scuttled by, the outbreak of the Covid-19 pandemic.

Curriculum theory alludes to several factors for the need for curriculum review. For example, McNay (2009) postulates that curriculum review can be occasioned by the requirement to fulfil an emergent need in society; new programmes are necessary to meet new challenges and opportunities; a change in the goals of the curriculum; and revitalisation of a dysfunctional (or irrelevant) education system. It can also be a result of a change in leadership which needs to pursue a particular educational philosophy or political ideology. Dyjur & Kalu (2018) also aver that the curriculum can be reviewed to meet newly defined expectations and standards; also, when learners are dissatisfied and disappointed by the curriculum.

The Government of Zimbabwe (GoZ) justified the heritage-based Education 5.0 philosophy (and the attendant curriculum thereto) as an endogenic, home-grown curriculum without any prejudices from the Western ethos and values of higher education delivery (MHTESTD, 2018). Keche (2021) contends that the Education 5.0 philosophy is underpinned by the belief that innovation and industrialisation should lead to the creation of goods and services that serve the need of society. Muzira and Bondai (2020) also postulate that the Education 5.0 curriculum moves away from producing graduates that are job seekers, instead, it prepares graduates to be employers, creating goods and services for the benefit of society and the economic development of the country from the knowledge they acquire.

To address the problem of unemployment and limited job opportunities for university graduates, and also in answer to other developmental challenges that the country is faced with requiring different creative, innovative, and enterprising ideas and solutions, the GoZ introduced the heritage-based Education 5.0 (MHTESTD, 2018). It seeks to cultivate entrepreneurial skills, innovation and creativity among students who are then encouraged to commercialise their innovations for the industrialisation of the economy and the development of industries (Maireva & Mabika, 2022).

The belief was that Education 5.0 can lead to the creation of new jobs, reduction of unemployment, generation of foreign currency from the export of goods and services produced through the beneficiation of raw materials and also help in the reduction of some vices such as drug abuse and criminality induced by poverty and unemployment (Muzira & Bondai, 2021). Hence, this continued evolution of higher education (HE) curriculum is necessary as a result of what Lee, Thurab-Nkhosi, & Giannini-Gachago (2005) alluded to when they argued that a curriculum should provide solutions to the challenges, like economic problems, that are faced by society the world over. Thus, the Education 5.0 curriculum is a welcome gesture in its quest to solve the sociocultural and economic challenges with which the country is faced. For example, Malaysia implemented a higher and tertiary education reform through what they termed Education 4.0 (Maria, Shahbodin, & Pee, 2018) which was meant to align the higher education system with global trends and the need to "... balance between both ethics and morality along with knowledge and skills" (p. 20).

In addition, the policy was meant to instil a sense of patriotism the same attribute the Malaysian Education 4.0 shares with Zimbabwe's Education 5.0 in respect of ontological and epistemological educational approach (Keche, 2021). The thrust of the Education 5.0 curriculum is on the local heritage or indigenous knowledge system (IKS) to produce goods through the use of locally available resources (Muzira & Bondai, 2020; Murwira, 2019; MHTESTD, 2018).

Any policy involving innovation and technology needs to be motivated by, and pay particular attention to, the creation of products and services that solve a problem in an industry or a sector to enrich the day-to-day lives of the ordinary man in the street (Bartzokas and Teubal, 2002). As such, Education 3.0 was seen as producing a graduate who was becoming irrelevant to the needs of industry and the demand for 21<sup>st</sup>-century skills for employability

(Maireva, Muza, & Beans, 2021). Thus, extensive research into 21<sup>st</sup>-century skills attempts to avail some insight into the HE curriculum (Oliver & Hyun, 2011). For example, Larson and Miller, (2011:121), state that the then Secretary for Education of the United States, stated that 21<sup>st</sup>-century skills ‘...increasingly demand creativity, perseverance, and problem-solving combined with performing well as part of a team.’ Thus, the demand for innovative and creative thinkers who contextualise society’s problems and generate solutions for them is both necessary, and in fact, mandatory.

The prevalence of technology, globalisation and internationalisation, knowledge-based economies, and the shift to industrialised societies led to the HE discourses on the need for 21<sup>st</sup>-century skills (Keche, 2021). Thus, the need for innovation and industrialisation and the extent to which it can be implemented in the education curriculum should necessarily be informed by the developmental situation of each country, in the context of the world, given the internationalisation of labour and the ubiquitous nature of the technology.

What is evident in the literature is that the concepts of innovation and industrialisation are not new to the 21<sup>st</sup>-century skill set and HE curriculum. These concepts are newly significant given that Dewey had already propounded that education should be grounded in experience (Johnson & Reed, 2008). Nowadays, the industry seeks able employees “... to find and analyse information from multiple sources and use this information to make decisions and create new ideas.” (Silva, 2009:631). This implies that students should learn those skills that are usable in the future, enabling them to be innovators and inventors as they interact with raw materials and nature to solve the ever-evolving problems of society.

As with any new innovation, adopting an innovation depends on a number of key factors, including the availability of financial resources, physical infrastructure, the complexity of innovation, and the attitude of the policymakers and the users (Rogers, 2003). Thus, given the uptake of Education 5.0 in HEI vis-a-vis the demands of the curriculum and also in the face of the Covid-19 pandemic had the result to “... force lecturers to simply scratch the surface” (Keche, 2021:3) as the lecturers did not perceive themselves as part of the curriculum reforms.

Before the advent of Covid-19, technology was mainly used as a teaching/learning aid in the education system (Beans, et al., 2020; Mandikiana, 2020). But after universities and college

closures as containment measures to stymie the spread of Coronavirus, technology became the bedrock upon which teaching and learning could be carried out. E-learning use became ubiquitous and often got used as the technology of utility in offering and sharing knowledge (Keche, 2021), while a combination of online, remote, face-to-face and distance learning was also utilised. However, the use of technology was not found to be very useful in the teaching and learning processes, mainly because the technology was used by lecturers just to lubricate the learning process rather than for changing how things were done in teaching (Jensen, et al., 2022; Maposa, 2021).

Given the thrust of innovation and industrialisation as the key pillars of Education 5.0 and the demands for hands-on learning to acclimatise with creativity and innovativeness Covid-19 disrupted the way learning is done. Innovation and industrialisation require that learning be individualised, impressionable, made-to-order, and learner-centred to enable learners to show mastery of the knowledge and skills learnt during and after higher education and training (Muzira & Bondai, 2020; Murwira, 2019).

Through Education 5.0 students are allowed to learn independently and in solitude using the internet. This allows creative and critical thinking and societal interface in inquiry-based learning. Creative thinking is concerned with “thinking outside the box”, which is thinking outside the limits of the conventional and what people are used to. This allows learners to be able to solve challenges they face in their day-to-day lives which is the main thrust of Education 5.0. While technology was deployed for teaching and learning, Utomo, Bon, & Hendayun (2017) argue that as teaching and learning become more and more technology-driven, administrative challenges intensify.

Given the challenges with access to data and technology, online teaching and learning could not be exclusively carried out leading to a dualised teaching and learning approach (Macheke, Taru, & Sibanda, 2022; Keche, 2021; Maposa, 2021; Mandikiana, 2020; Beans, et al., 2020). Thus, online learning was augmented with offline or traditional face-to-face teaching and learning. Hence, there was a need for the HEI to put in place policies and procedures to ensure that the teaching and learning process online was smooth and seamless. Several e-learning platforms such as Blackboard, Canvas, Eagle, Google Classroom and Moodle (Keche, 2021; Maphosa, 2021; Beans, et al., 2020) were used for online teaching and learning by most universities.

Given the above, the study sort to answer the following research questions:

- a. To what extent was the implementation of the Education 5.0 curriculum affected by the disruptions induced by the Covid-19 pandemic?
- b. How responsive have HEI been to the disruptions caused by the Covid-19 pandemic?
- c. What strategies did HEI put in place to ensure successful implementation of the Education 5.0 curriculum post-Covid-19 pandemic?

## **Methods and materials**

This section highlights the research methodology that was employed to collect empirical data for this study.

### ***Research design***

The study employed a qualitative research paradigm that was underpinned by an interpretivist research philosophy. Saunders, Lewis, & Thornhill (2016) postulate that an interpretivist research philosophy is based on three main assumptions, namely: meanings are constructed by people as they engage with the world they are interpreting; they engage with their world and make sense of it based on their historical and social perspectives; and the basic generation of meaning is always social, arising in and out of interaction with the community (Creswell, 2010; Mack, 2010; Crotty, 2008). In this study, the interpretivism research philosophy was chosen because of the research questions of the study which sought to explore the extent to which the participants of the study perceived the response of HEI to the implementation of Education 5.0 in the face of the Covid-19 induced disruptions to education and how the post-Covid-19 pandemic pedagogy could be implemented to fulfil the aspirations of the Education 5.0 given the multiple and subjective realities from the study participants.

The study employed a phenomenology research design. van Manen (1990:36) argues that “... lived experience is the starting point and endpoint of phenomenological research. Phenomenology aims to transform lived experience into a textual expression of its essence.” Phenomenological researchers first identify a phenomenon and then collect data from people who have experienced the phenomenon (Creswell, 2010). Thus, the purpose of phenomenology is to enter people’s world and then understand it from their perspectives. This enables one to determine if there are patterns in the experiences of others. Therefore, in

this study phenomenology was chosen because it places a strong emphasis on lived experiences and perceptions of those experiences by the participants.

### ***Sampling and sampling procedure***

The study collected data from a sample of 15 key informants that were drawn from three HEI in Zimbabwe – two public universities of applied sciences and technology and one general curriculum university. The key informants were all teaching staff in the three universities. The sample was drawn using a purposive sampling technique. The researchers employed purposive sampling as it involves selecting a few people or items to form a group, with common characteristics desired for the study, and from whom findings can be generalised to the whole population (Saunders, et al., 2016). The sampling technique was employed to select an information-rich sample that was judged on its ability to provide the required knowledge due to their lived experiences in university teaching during the Covid-19 era and the implementation of the Education 5.0 philosophy.

### ***Data collection method***

The study employed online semi-structured interviews to collect data from the sample of 15 key informants. The semi-structured interviews allowed the researchers to clarify the questions that the key informants may not have understood. Furthermore, follow-up questions were also asked. This enabled the researchers to get in-depth information from each subject by asking open-ended questions. The online semi-structured interviews were chosen in this study given the restrictions on movement for the researchers to collect data through face-to-face interviews.

### ***Data presentation and analysis***

Data was presented in narrative form that is in words and logically organised following the order of the research questions. Findings were interpreted in terms of the existing knowledge. Thus, data collected through interviews were organised and analysed explaining what the data meant. Content analysis was used as the data analysis technique. Content analysis is one of the most common forms of analysis in qualitative research (Nachmias & Nachmias, 2010). It emphasizes pinpointing, examining, and recording patterns or themes within data. Themes are patterns across data sets that are important to the description of a phenomenon and are associated with a specific research question.

### ***Ethical considerations***



In carrying out this study, the researchers took the following ethical consideration into account to protect research participants from harm and abuse: informed consent, anonymity, confidentiality, privacy and avoiding harm. The participants were informed of the purpose of the study and agreed to participate voluntarily. An assurance that the participants were free to discontinue the study was given. The researchers also informed the participants that they were being recorded and that the information was going to be kept confidential. To ensure the privacy and anonymity of the participants, they were given pseudonyms, thus a lecturer from the first university was coded as L11 (meaning Lecturer number 1 from university 1) in that order to L35.

## **Results and discussion**

The study sought to explore the extent to which the implementation of the Education 5.0 curriculum was affected by the disruptions induced by the Covid-19 pandemic, how responsive HEI were to the disruptions caused by the Covid-19 pandemic, and the strategies that HEI used to accelerate the successful implementation of the Education 5.0 curriculum post-Covid-19 pandemic. Data were collected from 15 key informants who were hands-on in the implementation of the Education 5.0 curriculum during the Covid-19 era. The sample was made up of 60% male and 40% female participants. The participants had over three years of lecturing experience at an HEI. This was significant because the participants were familiar with the Education 3.0 curriculum and were also involved in the implementation of the Education 5.0 curriculum. In addition, they had lecturing experience before, during and after the Covid-19 pandemic period. All the participants had a smartphone and access to a laptop or desktop computer. Access to information technology gadgets was also important as it enabled the participants to deliver content through the use of the gadgets.

The findings of the study are presented below in thematic areas which were guided by the research questions of the study. From the findings of the study, three themes were identified, namely the effect of the Covid-19 pandemic on the implementation of the Education 5.0 curriculum; the response of HEI to the disruptions induced by Covid-19 and lastly the strategies to accelerate the implementation of Education 5.0 post-Covid-19 pandemic.

### ***Effect of the Covid-19 pandemic on the implementation of the Education 5.0 curriculum***

The transition from Education 3.0 to Education 5.0 coincided with the outbreak of the Covid-19 pandemic. It came at a time when there was the need to limit or abolish face-to-face

teaching and learning and, in its place, synchronous or asynchronous online means. Given the thrust of Education 5.0 is on teaching, research, community engagement, innovation, and industrialisation, the first pillar was affected as teaching had to be moved online.

The study found that there was a haphazard transition to online learning. Given the unexpected directive by the central government to close HEI as a containment measure to stymie the spread of the Coronavirus, lecturers were unprepared for the transition. It needed for the lecturers to be trained in the use of online learning platforms to be used for the delivery of content. One lecturer, L14 indicated that

*We were unprepared. We were caught unawares by the sudden turn of events. We were used to teaching and learning through conducting face-to-face lectures, tutorials, presentations, and discussions. The move to online learning was abrupt, as it was unexpected. That in itself had a negative on Education 5.0.*

Some of the participants in the study indicated that while HEI transitioned to online learning, some of the content that was meant to be delivered could not be delivered as they required physical, face-to-face lectures with students. Lecturer L21 indicated that he teaches in the natural sciences field and there was a need to carry out experiments. Thus, these experiments could not be done online as they required the students to manipulate the ingredients.

Experiential learning is an important component in teaching learners to be creative and innovative. As alluded to by Dewey (cited in Johnson and Reed, 2008) experiential learning is key to the innovation and the commercialisation of ideas. Therefore, the students needed to hold in-class, physical experiments so that they learn how to manipulate materials, create prototypes, and test them to confirm the veracity of their experiments.

The second pillar of the Education 5.0 was research. The study found that research was a key and fundamental pillar in the quest for innovation and industrialisation. To this end, the participants indicated that research was critical for the development of new products and services to meet new and emerging needs of society, which resonates well with the Education 5.0 philosophy. The participants averred that students could be creators of knowledge that they can as well share with society to solve problems.

On the research pillar, the study found that lecturers had difficulties in carrying out their research activities as a result of the restrictions on movement and stay-at-home policies. It was only those who performed essential services were allowed passage. The process of obtaining movement passes was cumbersome and involving and some lecturers did not want to take the hustle. It was only those research studies that could be carried out online were conducted.

One lecturer L13 indicated that he was able to carry out his research activities online, using Google Forms, an online survey tool. The study also found that the other tool that was used for collecting research data was MS Forms. Therefore, where physical research could not be carried out, the participants indicated that they were able to use online tools for research purposes. The findings of the study agreed with Keche (2021) who also argued that the research pillar is important and HEI positioning, including policies and strategies, needs to change to meet the challenges, and prospects, presented by changes in society, for example, the need to create new products and improve the standard of living.

One participant, L31, indicated that there were limited funds to undertake their research activities. In addition to the restrictions on the movement, funding was found to be a key impediment to the successful implementation of the Education 5.0 curriculum in the face of Covid-19. The findings of the study were in sync with Muzira and Bondai (2020) who found that there were limited financial resources to implement the Education 5.0 curriculum. Research being key, would have required the HEI to participate in undertaking the research activities to increase the stock of knowledge in society.

In respect of the third pillar of community engagement, the participants indicated that they also could not fully engage with the community to disseminate information from their findings. However, the HEI were able to provide its services to the community, especially to those that were considered essential to the fight against the Covid-19 pandemic. The main community engagement that the HEI was involved in was the production of personal protective equipment (PPE) such as the production of hand sanitisers.

One participant, L25, indicated that they were involved in the production of hand sanitisers using the university laboratory. Hand sanitisers were used by the community, particularly during the reopening of primary and secondary schools. The hand sanitisers were part of the

activities of some of the innovation and industrialisation hubs that were set out at all universities.

The fourth pillar in the Education 5.0 curriculum was an innovation. In respect of this pillar, the study participants indicated that they were expected to teach students to be innovative, to think out of the box and to be creative. The participants indicated that Education 3.0 inhibited innovation and creativity as it was designed for a stereotypical employee. The participants, all of whom were familiar with Education 3.0 and the dictates of Education 5.0 applauded the latter for its vision to transform and industrialise the economy. The findings are in sync with the findings of Keche (2021) and Muzira and Bondai (2020) who found that it was designed to create employees thereby stifling the entrepreneurial mindset in the learners, which is key to industrialisation and commercialisation of innovations. Thus, it was found that the intents of the innovation pillar were noble. However, it was found that there was limited funding to enable the full financing of the innovations that the HEI were coming up with.

It was found that one of the HEI innovation and industrial parks was used to produce products locally available in the community, for example, the use of indigenous fruits to produce drinks. The finding agrees with Keche (2021) who alluded that Education 5.0 was aimed to commercialise indigenous knowledge systems (IKS) to preserve locally available raw materials. The Covid-19 pandemic affected the free movement of people. In the case of HEI innovation ideas could not be undertaken and implemented as HEI could not carry out physical experiments that can be used to test a prototype before they can be produced in large quantities.

A few cases of industrialisation were recorded in the HEI. Most of the industrialisation was noticed in the production of hand sanitisers by most of the universities that were used in the fight against Covid-19. A few innovation and industrial parks started the production of goods for the market. These products include bottled water, hand sanitisers, and fruit juices from locally available indigenous fruits. Given that there was a low level of innovation in the HEI, industrialisation was also at a low level.

### ***Response by HEI to disruptions caused by the Covid-19 pandemic***

The immediate response for all the HEI was to close campuses across the country as directed by the central government and transition to online learning. The study found the initial call

for HEI closure was announced abruptly and there was no plan in place to compensate for lost time. L15 stated that:

*Initially, we were just told to go and stay at home. There appeared then like there was no plan on what to do next. It was after several weeks that we were advised that we would proceed through online learning. We were then taken through a crash programme on what was expected of us to study delivering content online.*

Another participant L32 had this to say:

*It was abrupt and spontaneous. It came without warning, we were so unprepared for what was to come. In hindsight now it was nightmarish – you are scared for your own life and there is the demand that learning should proceed. You are not even sure of what it will be for you.*

But once the initial shock was over, there was a systematic and phased re-opening of HEI to continue the provision of tuition, albeit online or in a blended approach to make up for lost lecture time, but also to prepare students adequately for employability. This study found that most of the participants used online teaching and learning method to deliver their content to students. The most commonly used platform to deliver content that was used by most of the lecturers were social media networks such as WhatsApp and Facebook.

It was found that not many lecturers used Learning Management Systems (LMS) such as Blackboard, Canvas, Google Classrooms and Moodle. When asked why there is limited use of the LMS one participant L31 had this to say:

*Our university's preferred LMS is Google Classrooms. I hardly use the LMS because few of my learners have access to LMS, most will be in remote areas where mobile network connectivity has limited bandwidth and websites that require heavy data usage will not load properly. So valuable time is lost while trying to connect to the website. WhatsApp is easy because almost everyone has a smartphone and network connectivity is better as it uses the lowest bandwidth.*

Another participant L24 said that:

*We were expected to use Moodle for online learning. I was never trained on how to use the LMS, but I was expected to use it to deliver content to my learners. On their*

*part, the students also did not know how to use the platform. Given this challenge, I resorted to the use of social media networks as they were easily accessible and easy to use.*

The finding that lecturers were using social media platforms to deliver learning content in place of LMS corroborates earlier findings by Beans, et al. (2020). While in the Beans, et al., (2020) findings it was found that there was a haphazard approach, the present findings show that there were concerted and coordinated efforts by the HEI to ensure that teaching had received some training on the use of the LMS.

The finding was also consistent with Maphosa (2021) who supported the findings by using results from another study by the World Economic Forum (WEF) that found that less than 25% of countries in the global south had set up systems that support online learning. Therefore, even two years after the pandemic, there still was a very low uptake of the LMS platform to ensure smooth teaching and learning. Instead, staff and students continued to rely on social media networks. [29] shared similar views about the state of after Education 3.0.

The study also found that the cost of internet connectivity remained exorbitant and unaffordable to students and staff alike. The cost of data remained a big inhibiting factor in the uptake of online learning. One participant L13 had this to say:

*I tried to insist on my students attending online classes, but I always had a few students participating in the online discussions. I then realised that the cost was a harbinger of the online delivery of content. So, what I resorted to is to make sure that I cover as much ground as possible during face-to-face sessions. Students will then be working on assignments when they are off campus.*

Limited bandwidth, slow network connectivity, lack of compatible gadgets, untrained staff, limited resources, and access to technology were found to be some of the other barriers to an effective transition to online learning. Even though the world has been grappling with the Covid-19 pandemic for two years, these basic demands for online learning remained unresolved. Online learning requires the requisite infrastructure and consistent support in terms of the technology to be deployed to achieve this aim.

As Beans, et al., (2020) noted, there was a need for commitment from mobile network operators and the responsible ministry to work out modalities for enabling access to bandwidth for students and staff when off campus. The findings are also consistent with Jensen, et al. (2022) who report, in a global survey of HE that HEI in the global south remained seized with issues of access to the internet and the high cost of accessibility.

The study also found that most of the participants were getting used to the demands and the rigour of blended learning. Most of the participants were getting to enjoy the online delivery of learning content as it allowed them to deploy technology in their day-to-day work. They were also experimenting with other platforms to ensure learners were adequately provided with learning content.

The study further found that the technology divides between the younger and older teaching staff remained. Here it was found that younger staff members were more open to the use of technology in their pedagogy than older staff members who believed in face-to-face tuition. This result is consistent with Maphosa (2021) and Beans, et al. (2020) who found that older staff members were not comfortable using technology as they did not see its usefulness except as a teaching aid. Thus, this inhibited the successful use of technology in learning. Accordingly, blended learning was the method of choice for most lecturers.

The study findings agree with Keche (2021) who averred that there was a blend of face-to-face and online learning during the Covid-19 pandemic. With blended learning, a combination of online, remote, distance and face-to-face learning is integrated. Thus, the students came for a few weeks of face-to-face classes then completed the rest of their semester from home and return to campus to seat for the final examinations. In this regard, L22 stated that blended learning was a lifesaver:

*Blended learning was a stroke of genius. I was not comfortable with completely offering tuition online so the opportunity for face-to-face tuition was most welcome. I maximised my time during the physical lectures.*

***Strategies to accelerate the implementation of Education 5.0 post-Covid-19 pandemic***

The participants of the study suggested several strategies that could be implemented by HEI to accelerate the implementation of Education 5.0 given that cases of Covid-19 have started to show a decline. While it may be too soon to say how Covid-19 has altered university campuses and the learning process, it is evident that the transition to online learning has altered the ways of academic interactions between lecturers and students even with face-to-face instruction has been restored and the way they experience the lecture room. Together, those efforts familiarized many faculty members with new ways of teaching, even before the pandemic forced all classes off campus.

One of the participants L32 indicated that the experiences derived from online learning provided important insights into the use of online tools to engage students to test their command and mastery of learning materials regularly, enable them to collaborate and learn from each another, and create their student communities, and create new forms of the collaborative experiences that enrich face-to-face residential learning. This will enable students to learn from each other and collaborate on research projects that may lead to the production of innovations for the production of goods and services.

One of the participants, L14, reiterated that the role of technology in HE should be that of being an enabler. The participant indicated that blended learning, which is a combination of online and in-person elements, should be enhanced to ensure that full-length lectures that are transmitted online result in passive learner experiences and diminishing student attention. This impairs the learners to be creative and innovative. Resultantly, he stated:

*Long lectures that were familiar in the face-to-face classroom, or those to which lecturers and students had become accustomed, did not work well online. Content had to be broken into small chewable chunks so that students maintain their attention. If online lectures are to continue, the use of interactive and communication utilities must be made use of to make online discussions and problem-solving the focus of class sessions.*

Another participant L34 indicated that for most lecturers, going forward, lecturers must flip their classes between active-learning-focused classes live (or synchronous) and with lectures taped for student viewing at any time (or asynchronous). Keche (2021) alludes that the



synchronous and asynchronous approach enables lecturers to present live lectures and also record others so that students can learn in their own time or at their own pace.

The participants also indicated that there is a need to 'reimagine the classroom' by incorporating the best lessons from online learning into the face-to-face and also vice-versa. To achieve this, blended learning experiences were found to provide the opportunity for new ways of teaching and learning as well as meeting students wherever they are. Thus, blended learning represents a fundamental mindset shift beyond the binary alternatives of entirely online or face-to-face delivery and learning experiences.

### **Conclusion**

The post-Covid-19 pandemic pedagogy has seen institutions transitioning to a blend of online, remote, and face-to-face teaching against the demands of the Education 5.0 heritage-based higher education philosophy. The Covid-19 pandemic presents new opportunities that lecturers need to consider for alternative and flexible delivery of educational content to face-to-face. Based on the findings, the study concludes that the Covid-19 pandemic-induced HEI closure disrupted the implementation of the Education 5.0 curriculum as the five pillars could not be fully performed. Teaching had to be moved to online platforms where there was inadequate funding and technologies as well as limited access to the learning content. Research and community engagement activities were inhibited as well as they could not get free passage to undertake their research activities. Innovation and industrialisation activities could not be fully implemented as a result of limitations on movement and the failure of students to engage in creative and innovative activities that could create new products and services.

### **Recommendations**

From the findings of the study the following recommendations were made:

- That the parent ministry, the MHTESTD and mobile network operators should invest in ICT infrastructure to support blended learning so that there is improved accessibility and connectivity. This should extend to internet service providers (ISP) so that there is cheaper accessibility to educational content in the case of pandemics and natural disasters

- Lecturers must be trained in the use of digital media. This will help to ensure that learning continues even during pandemics and natural disasters that may interrupt face-to-face learning.
- The central government should show its commitment to embracing 21st-century learning by crafting national policies that support modern teaching and learning. There is also a need to finance the innovation and industrialisation initiatives of HEI

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