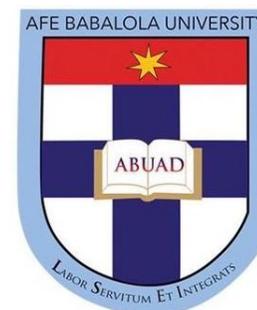




# The Journal of Sustainable Development Law and Policy



ISSN: 2467-8406 (Print) 2467-8392 (Online) Journal homepage: <https://www.ajol.info/index.php/jsdlp>

Has Covid-19 really moved education to 4IR where learning will be digital, with a few occasions of face-to-face engagements?

**Vincent Motau**

**To cite this article:** Vincent Motau (2023). Has Covid-19 really moved education to 4IR where learning will be digital, with a few occasions of face-to-face engagements? The Journal of Sustainable Development, Law and Policy. Vol. 14:2. 222-241, DOI: [10.4314/jsdlp.v14i2.12](https://doi.org/10.4314/jsdlp.v14i2.12)

**To link this article:** DOI: [10.4314/jsdlp.v14i2.12](https://doi.org/10.4314/jsdlp.v14i2.12)



Published online: December 1, 2023.

Full Terms & Conditions of access and use can be found at <https://www.ajol.info/index.php/jsdlp>

# HAS COVID-19 REALLY MOVED EDUCATION TO 4IR WHERE LEARNING WILL BE DIGITAL, WITH A FEW OCCASIONS OF FACE-TO-FACE ENGAGEMENTS?

**Vincent Motau**

**Citation:**

Vincent Motau (2023). Has Covid-19 really moved education to 4IR where learning will be digital, with a few occasions of face-to-face engagements? *The Journal of Sustainable Development, Law and Policy*. Vol. 14:2. 222-241.

**Submitted:**

06 August 2023

**Final version received:**

30 October 2023

**ISSN:** 2467-8406 (Print)

2467-8392 (Online)

**ABSTRACT**

The outbreak of the Covid-19 pandemic had an impact on institutions of higher learning in Africa. As a result, the government introduced a new system of learning that led the institutions of higher learning to shift away from physical or face-to-face teaching and learning to online. This made some of the universities comprehend that online learning is doable in Africa. The aim of this study is to examine whether Covid-19 really moved education to 4IR where learning will be digital, with a few occasions of face-to-face engagements? This paper followed a qualitative methodology and was guided by an exploratory research design. The data was collected from 25 participants who were selected purposively. The collected data was transcribed using Microsoft Word and analyzed using thematic content analysis. A key finding of this paper is that the lectures and students were inconvenienced by the introduction of online learning and teaching. Most of the academic institutions still prefer physical learning because it is effective and affordable. This paper recommends that a hybrid approach of teaching and learning be adopted as the digital system should also not be abandoned post-COVID-19 because it makes it easier to conduct teaching and learning in institutions of higher learning.

**Keywords:** COVID-19, Fourth Industrial Revolution (4IR), Online Learning, Blended Learning, Lockdown.

## 1. INTRODUCTION

The outbreak of COVID-19 has been one of the global daily topics and it has brought severe impacts in many aspects such as businesses, education, tourism etc. During the outbreak of Covid-19, many nations have embarked on confinement as a strategy to slow down the spread of coronavirus.<sup>1</sup>

When countries embarked on lockdown gatherings and travelling were all constrained with the intention to slow down the spread of Coronavirus.

The restriction of gatherings led the tertiary institutions to switch from physical learning to virtual learning.<sup>2</sup> This led to an increase in the global adoption of digital technology and the 4IR method in Africa, especially in academic institutions. Affirming that Africa was not yet prepared for the 4IR, the sector of tertiary institutions in Africa realized that they had to adopt the 4IR method as the COVID-19 pandemic spread over the globe.

The idea that Africa needed to be ready for this transformation in the economy and people's means of subsistence was universally acknowledged. The experts advised that the 4IR would significantly improve the struggling African economy. The teaching and learning system in Africa needs to be adopted in order to prepare young people to have the essential skills to find employment in the future, which is acceptable given the concern over the loss of jobs.

For instance, South Africa, like the majority of other countries, began taking action against the COVID-19 epidemic in March 2020, which drastically altered everyone's way of life. Businesses closed as a result of the lockdown procedures, and individuals stayed at home, only venturing out to buy basic food items.

---

\* Department of Cultural & Political Studies, University of Limpopo, Limpopo, South Africa. Email: Vincentmotau9@gmail.com

<sup>1</sup> Nyarko R.O, Boateng E, Kahwa I, Boateng P.O, and Asare B, 'The impact on public health and economy using lockdown as a tool against COVID-19 pandemic in Africa: a perspective. (2020)5 Epidemiol Public Health Rev

<sup>2</sup> Patrick H.O, Abiolu R and Abiolu O.A, 'Reflections on COVID-19 and the viability of curriculum adjustment and delivery options in the South African educational space' (2021)6 Transform. High. Educ 101

Therefore, the nationwide restriction influenced the schedule adjustment for the 2020 academic year. In response, several colleges and universities moved some of the classes to their online platforms, minimizing the effect of the academic interruptions. A lot of the Fourth Industrial Revolution components suddenly became essential to daily living.

There are many difficulties that higher education institutions are still experiencing while conducting online teaching and learning that may even make it questionable if Africa is prepared to use digital in teaching and learning.<sup>3</sup> However, some other universities have adapted quickly to the digital system, conducting few in-person interactions. Today, some universities continue to run their academic operations digitally, while others still run them face-to-face.

## 2. BACKGROUND

In 2020; the year 2019, COVID-19 was discovered in one of the Chinese cities called Wuhan in the Province of Hubei.<sup>4</sup> As soon as the disease began to cause destruction, the World Health Organization (WHO) was compelled to declare it a worldwide epidemic. On March 5, 2020, the initial verified COVID-19 case in Africa was noted. In South Africa, the Covid-19 case was located. Before the Coronavirus pandemic outbreak in 2020, no one could have predicted that the 4IR approach would be used in Africa since the continent was not ready to adopt digital methods in higher education institutions and business sectors because they believed that technology would replace the labour force. The employment chances will therefore be compromised if they used digital techniques, which would worsen Africa's employment crisis. Africa was not ready to accept this strategy, because it was too contentious, but Covid-19 eventually forced their hand.

---

<sup>3</sup> Al-Fadly A, 'Impact of COVID-19 on SMEs and employment' (2020)8 Entrepreneurship and sustainability issues 629

<sup>4</sup> Sohrabi C, Alsafi Z, O'neill N, Khan M, Kerwan A, Al-Jabir A, Iosifidis C, and Agha R, 'World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19)' (2020)71 International Journal of Surgery 71,76.

The tertiary institutions were also unaware that students would eventually complete their academic work online in order to avoid personal contact, which was severely forbidden during the lockdown. When connecting with students, many tertiary institutions started using Blackboard to run their classes. However, those with limited access to gadgets and data experienced a serious challenge in attending online classes.

The 2019 coronavirus disease epidemic has caused a worldwide medical emergency that has significantly changed the way we live our daily lives and perceive the world.<sup>5</sup> The rapidity at which infections occur and patterns of dissemination are a challenge to our sense of agency, but so are the safety measures put in place to restrict the transmission of the virus, which necessitate isolation from society by abandoning what is fundamentally human—seeking comfort in the presence of others.

However, the discussion regarding the 4IR method in the institutions of higher learning has been one of the controversial issues in Africa since some other universities are still struggling to adapt to the 4IR method because they have limited resources that could make them adjust to the 4IR. In other words, because there was no preparation for a situation like that, Universities without 4IR tools were compelled to close down at the initial phase of the lockdown. Due to issues with the internet, data costs, and infrastructures, this is expected to happen frequently across the entire African continent. Several African universities, particularly those which are rural-based were impacted.

### 3. LITERATURE REVIEW

First and foremost, it is important for the researcher to define the 4IR and COVID-19 in order to give a clear direction and to support his arguments based on other scholars' views. The term COVID-19 also known as SARS-COV-2 or the new coronavirus

---

<sup>5</sup> Saxena, S.K, 'Coronavirus disease 2019 (COVID-19): epidemiology, pathogenesis, diagnosis, and therapeutics.' [2020] Springer nature 9,16

is responsible for severe respiratory disease.<sup>6</sup> Scientists have determined that the COVID-19 sickness is caused by this virus, which originally emerged in China's Wuhan City at the end of the year 2019.<sup>7</sup>

The Fourth Industrial Revolution as a combination of technologies that hides the boundaries among the biological, digital, and physical realms.<sup>8</sup> Davis further asserted that even while these features rely on the apparatus and foundation of the Third Industrial Revolution (3IR), the 4IR demonstrates entirely novel methods in which technology becomes ingrained across societies and even our human bodies.<sup>9</sup> The 3IR served as a foundation for the fourth, which incorporates technology from the physical, biological, and digital realms. Davis added that the term "4IR" in this case alludes to the fusion of biotechnology and information technology. The 4IR is changing every area of everyday life, including how individuals use technology, where they work, and how they do it.

The 4IR idea is supported by several technologies.<sup>10</sup> Among these are new computing technologies, neurotechnology, sophisticated materials and nanomaterials, energy transfer, storage, and transmission, and space technologies. They also include ubiquitous linked sensors, manufacturing using additives, robots and Artificial Intelligence (AI), digital and enhanced realities, digital currencies, and decentralized financial technology.

### **3.1. Impact of the fourth industrial revolution on teaching and learning**

The tertiary institutions in the 4IR are dialectical and complex, having the potential to transform civilization.<sup>11</sup> In their subsequent argument, The 4IR artificial intelligence-powered

---

<sup>6</sup> Szturmowicz M, and Demkow U, 'Neutrophil extracellular traps (NETs) in severe SARS-CoV-2 lung disease (2021) 22 International journal of molecular sciences 8854

<sup>7</sup> Sansa, N.A, ' Analysis of the Impact of the Covid-19 to the Petrol Prices in China' (2022)19 Divers. J. Multidiscip.

<sup>8</sup> Davis, N. 'What Is the Fourth Industrial Revolution?' ( World Economic Forum: Geneva, 2016)

<sup>9</sup> Ibid, 12

<sup>10</sup> Um, J.-S, 'Introduction to the Fourth Industrial Revolution. In Drones as Cyber-Physical Systems' 2019] Springer: Singapore 1,20

<sup>11</sup> Xing, B, & Marwala, T, Implications of the Fourth Industrial Age on Higher Education. (ArXiv, 2017)

features would move away from task-based features and toward human-centred features in the workplace.<sup>12</sup> The convergence of man and machine would result in a narrowing of the gap between the humanities, social sciences, and technology.<sup>13</sup>

However, it is also important to understand that these correlations will necessitate more transdisciplinary education, research, and creativity. Online learning might be seen as the future of education as the educational system is evolving.<sup>14</sup> The researcher thus concurs with Reaves (2019) that the educational system required reform to be able to impart 21st-century skills like "flexibility, ability to adapt, investigation, compassion, innovative thinking, and understanding how to acquire knowledge" to varying degrees and across a range of subjects. In order to teach and allow for the practice of 21<sup>st</sup>-century skills, even online learning needs to be restructured.<sup>15</sup>

### **3.2. Implications of covid-19 on the digital transformation leading to the fourth industrial revolution**

Coronavirus posed a serious impact on tertiary institutions. When countries embarked on the lockdown, academic operations had to be stopped for a few days until the universities found alternative strategies to continue with their day-to-day businesses because all gatherings were restricted during the lockdown. However, while the academics were disrupted because of Covid-19 the 4IR brought a solution to the challenges that the Institutions of higher learning were facing. Even though it was a bit challenging for the higher learning institutions to adopt the 4IR method, they finally adapted and managed to cope. However, it is significant to consider the challenges that higher learning institutions experienced during COVID-19 when conducting online classes.

### **3.3. African countries' response to combat covid-19 in academic institutions**

The Fourth Industrial Revolution's (4IR) techniques are now being implemented, and this is a hot topic across the globe given

---

<sup>12</sup> Ibid

<sup>13</sup> Ibid

<sup>14</sup> Reaves J, '21st-Century Skills and the Fourth Industrial Revolution: a Critical Future Role for Online Education' (2019)3 International Journal on Innovations in Online Education

<sup>15</sup> Ibid

the anticipated disruptions. People can plan accordingly for the 4IR by receiving the proper education, which is seen as a key tool in this process. However, it's crucial to look at how some other African countries handled Covid-19's impact on academic institutions. The researcher used Zimbabwe, Botswana, and South Africa as examples to look into the effects of COVID-19 on higher learning institutions.

### **3.4. South Africa**

The COVID-19 pandemic's presence influenced changes in the South African system of education.<sup>16</sup> Due to tight pressure and the need for social distance, academic institutions were forced to adopt the various 4IR technologies to make remote learning possible and an accomplishment. It is believed that to meet the needs of the 4IR, the South African educational system should switch to a blended learning paradigm for teaching and learning. It is also believed that South Africa may benefit from the adoption of blended learning such as increasing accessibility while being economical and effective.

The use of blended learning has been viewed as widening the experiences of learners since it allows them to obtain support whenever they need it and from any location where they are connected. In addition, blended learning supports the modification of instructors' customary roles (Mhlanga, 2020). Additionally, blended learning, which blends classroom instruction with online learning, is regarded as having some advantages as it can enrich students' learning while also relieving lecturers of administrative and workload burdens and resulting in a more integrated learning environment (Mhlanga, 2020). It is crucial to remember that for online lectures to be successful, students must have laptops. However, a study by Mhlanga (2021) reveals that Several students in academic institutions lacked access to gadgets necessary to log into online courses at their universities.

### **3.5. Zimbabwe**

Tshili (2022) claims that the President of Zimbabwe, Mnangagwa Emmerson imposed a lockdown for 21 days beginning on March 30, 2020, restricting travel inside Zimbabwe, closing most stores,

---

<sup>16</sup> Mhlanga D, and Moloi T. 'The Stakeholder Theory in The Fourth Industrial Revolution' (2020)<sup>12</sup> International Journal of Economics and Finance Studies

suspending all schools and stopping all flights in and out of the country in an attempt to halt the transmission of COVID-19. For a short period in 2021, educational institutions were physically open.<sup>17</sup> Mr Emmerson Mnangagwa postponed the reopening of schools indefinitely in 2022 because of the high number of virus infections in the country. Only exam courses were permitted to resume classes on January 10 as opposed to the rest of the school year, which was originally scheduled to begin on January 10.<sup>18</sup>

However, during the lockdown in Zimbabwe, the circumstances of Covid-19 made it difficult to fully deploy online modes of teaching and learning because neither lecturers nor students have the necessary Information and Communication Technology (ICT) skills.<sup>19</sup> Therefore, it is clear that university students had a drastically inconsistent amount of access to education due to the inability of ICT infrastructure to adjust educational models for online learning. Following the Covid-19 crisis, virtual learning has emerged as the most practical way to deliver education in Zimbabwe, however, the majority of higher learning institutions in Zimbabwe remain hesitant to fully embrace e-learning concepts. However, in Zimbabwe, many 4IR tools were released during the lockdown, and remote (online) learning took over in tertiary education. These findings show that Zimbabwe usually possesses several outstanding qualities that could propel the educational industry towards the fourth industrial revolution, which could expand access.<sup>20</sup>

### 3.6. Botswana

Among the top 10 systems of education in all of Africa is found in Botswana. Parents, students, and lecturers were unintentionally left alone in their houses when the country declared a nationwide state of emergency and absolute lockdown for six months in advance of potential COVID-19 events.<sup>21</sup> Botswana is having

---

<sup>17</sup> Tshili N, 'President Defers Schools Opening' (Chronicle, January 2, 2022)

<sup>18</sup> Mazingaizo S, 'About 4.6-Million Pupils Affected by Zimbabwe's Decision to Keep Schools Closed' (Business Live, January 4, 2022)

<sup>19</sup> Chisango G, and Marongwe N, 'The digital divide at three disadvantaged secondary schools in Gauteng' (2021)82 South Africa. *Journal of Education* 149, 165

<sup>20</sup> Chinengudu T, Chakamba J and Hondonga H, 'COVID-19 and the Digital Transformation of Education Lessons Learnt on 4IR in Zimbabwe' ( IGI Global, 2022).

<sup>21</sup> Motshabi K, 'Lessons from Botswana on Continuing Learner Engagement during Covid-19' (REACH, October 13, 2020)

difficulty preparing for the 4IR through education because of challenges with its curriculum and a shortage of energy in rural regions, among other things.<sup>22</sup>

This can be supported by claims by Mphahlele, Seeletso & Muleya asserted that since the introduction of distance learning, it has been undisputed that students have trouble finding resources for studying online.<sup>23</sup> Students in graduate programs have access to online resources because their coursework typically involves journal articles. The Learning Management System (LMS) is still challenging to utilize access and information properly. Some students experienced problems utilizing the online system and logging in. These children struggled to retain much of the information. Additionally, they abstained from taking part in online exams, discussion boards, and chats.<sup>24</sup>

### **3.7. Zambia**

In Zambia, public as well as private educational institutions (schools, colleges, and universities) primarily use physical conventional methods of instruction and learning. The unexpected outbreak severely disrupted teaching and learning in Zambia's higher education institutions. As a result, Zambia's educational systems were compelled to adopt online learning. A study conducted by Mukwena & Sinkala shows that in most universities in Zambia, their studies were conducted face-to-face.<sup>25</sup> The study reveals that Prior to the COVID-19 epidemic, higher education institutions that offered remote learning courses received their students' assignments by mail and email.

The study also revealed that following the shutdown of schools in Zambia, the higher education institutions that offer distance learning programs were compelled to start utilizing the e-learning platforms to supply curriculum to students. They used their online learning systems to deliver lecture notes and ongoing evaluations.

---

<sup>22</sup> Chinaza U, 'Scholarly discourse of the fourth industrial revolution (4IR) and education in Botswana: a scoping review' (2022) 28 *Education and Information Technologies*

<sup>23</sup> Mphahlele, Seeletso and Muleya, 'The Influence of COVID-19 on Students' Learning: Access and Participation in Higher Education in Southern Africa' (2021) 3 *The Journal of Learning Development* 506.

<sup>24</sup> *Ibid*, 507

<sup>25</sup> Mukwena A.R, and Sinkala M, 'The Impact of COVID-19 on the Higher Education Sector in Namibia: The Case of Public Higher Learning Institutions' (2020) 8 *International Journal of Education and Research* 204

The majority of lecturers lacked experience with online content delivery. Some instructors carried on sending academic materials and tests using email rather than a system of e-learning, despite having received training during the pandemic.<sup>26</sup> Regardless of the type of study one had registered in, the new normal of online learning presented difficulties for both lecturers and students.

#### 4. RESEARCH METHODOLOGY

The systematic methods that researchers use to gather data are known as the research methodology.<sup>27</sup> He further argued that it serves as a manual for researchers, outlining the steps for conducting research. The reader can evaluate the study's overall validity and dependability using the research technique.<sup>28</sup> The methodology section answers two key issues, namely how the data was acquired or generated and what approach was taken to analyze it. This study used a qualitative technique and an exploratory research design as its point of departure. The data was collected from 25 participants who were selected purposively. Interviews that were semi-structured with open-ended questions were done by the researcher. A thematic analysis was used to analyze the data that was gathered.

Specific data sets were purposely selected by the researcher when gathering data. The researcher interviewed students and lecturers to speak about their COVID-19 encounters. The researcher chose a qualitative strategy because it promotes interaction between respondents, which is important. After all, they rely on the remarks, perceptions, thoughts, opinions, and ideas of others. The researcher was unable to speak the language of each of the participants. However, both participants and the researcher were fluent in English. Therefore, English was employed as the language of communication throughout interviews.

---

<sup>26</sup> Ibid, 205.

<sup>27</sup> Igwenagu C, *Fundamentals of research methodology and data collection* (LAP Lambert Academic Publishing, 2016)

<sup>28</sup> Irny S.I, and Rose A.A, *designing a Strategic Information Systems Planning Methodology for Malaysian Institutes of Higher Learning (isp- ipt)*, *Issues in Information System* (2005) 1 *African Journal on Conflict Resolution* 34-39

The inclusion of dynamic processes like interviews and group discussions increases the involvement of respondents compared to a structured survey.<sup>29</sup> Last, but not least, it gives researchers a chance to involve participants in projective techniques. In this study, the researchers used Interviews to examine whether. Education has been significantly advanced by COVID-19 to the point that learning will mostly be digital with few face-to-face interactions.

## 5. FINDINGS

The interviewees responded to all the questions. A researcher looked into potential connections between the study's results and the literature they had evaluated when the data was explained. The following presents and examines the data that was gathered. The researcher asked participants to share their knowledge and experiences regarding the impact of the 4IR in African higher education institutions to measure and determine whether COVID-19 moved education to 4IR, where learning will be digital with sometimes face-to-face interactions.

### **5.1. Covid-19's effects on african higher education institutions**

When COVID-19 stoke in Africa, academic institutions were caught off-guard because they were not expecting it. Post the Covid-19, higher education institutions were shut down to stop or slow the spread of COVID-19. The Covid-19 outbreak had a severe impact on African academic institutions. However, to find out more about the COVID-19 impacts on African academic institutions, the researcher conducted interviews and asked the students and the lecturers about their experience during lockdown when they were attending online.

---

<sup>29</sup> Barbie R, & Camp T, *Research Methodology Approach* (International Universities Press, 2001)

## 5.2. The lack of technological devices

Participant 1 stated that,

“The experience that I had during lockdown when attending online is that I didn’t have a laptop to attend online classes and it has affected my academic performance because I was missing classes”.

Participant 2 stated,

“Our university delayed giving us tablets so that we can be able to attend online but those who are staying in the communities surrounding the university received their tablets on time”.

Participant 3 revealed that,

“Our university didn’t give us tablets but when we registered in January 2020 during our first year, we were promised that the university would give us tablets, even today we have never received them”.

Participant 4 asserted that,

“I had no devices to connect but I used to borrow a phone from my elder brother so that I could connect and attend classes. But by the time he was not around, I used to miss classes because he was the only last option that I had”.

Participant 5 affirmed that,

“I never attended any online classes because I never had a laptop, tablet, or smartphone, but I used to get updates from one of my friends who was attending online classes all the time. Due to the lack of connective devices, I didn’t manage to write tests and exams.

The results of the participants are consistent with Mbodila,; and Tadesse & Muluye, the effects of the national lockdown have significantly affected teaching and learning in higher education, particularly for less fortunate students who cannot afford the necessary resources to support online learning.<sup>30</sup> However, Molosankwe and Ferri, Grifoni, & Guzzo (2020) contend that most students and teachers found the decision to study online to

---

<sup>30</sup> Mbodila M, ‘Online learning: The pandemic cannot change reality University World, ( News South Africa, 23 April 2020)

be convenient because it allowed them to do their coursework whenever and wherever they wanted while sitting at home.<sup>31,32</sup> Coronavirus had negative effects on academic institutions since they were compelled to fast transition to online learning without sufficient resources to keep up with the pace of learning.<sup>33</sup> Particularly disadvantaged rural academic institutions have little resources to support their faculty and students.

### **5.3. Challenges experienced by lectures when conducting online learning**

When online classes are being conducted in institutions of higher learning, not only do students experience challenges, but the lecturers also experience challenges. Therefore, the researcher also interviewed the lecturers to tell their experiences when they are conducting online learning. Faculty might not have had enough time to thoughtfully create the courses online to effectively make use of the advantages of the format that is online. Some faculty members might not have had any prior experience using online teaching methodologies, which made the process of learning more challenging.

Participant 6 revealed that,

As a lecturer, it is difficult for me to conduct online classes because I am from rural areas. When there is load shedding, we always experience network problems. Therefore, I prefer face-to-face than online.

Participant 7 said,

It is not easy for us as lecturers to conduct online classes because even if we come here on campus to connect so that we conduct online classes, the WiFi sometimes is limited. Therefore, we must use our data.

---

<sup>31</sup> Molosankwe B, 'UJ students reject planned online teaching to start next week' ( The Star News,17, April 2020)  
<sup>32</sup> Ferri F, Grifoni P, and Guzzo T, 'Online Learning and emergency remote teaching: Opportunities and challenges in emergency situations' [2020] Journal of Societies 108  
<sup>33</sup> Paterson, M. 2021. COVID-19 and higher education: Damage done; lessons learnt. University World News, 11.

Participant 8 stated that,

Students are not signing in on time to attend online classes, and others signing in after 5-10 minutes when class starts. Others signed out earlier before we could even finish the class.

Participant 9 argued that,

The challenge that I was experiencing when we were attending online was that students didn't submit their work on time. They always blame the network.

Participant 10 revealed that,

Students always miss tests and sometimes fail to submit their assignments claiming that they are residing in rural areas and there is no network.

Participant 11 revealed that,

I don't have many bad experiences when conducting online classes because my students don't give me a problem and I don't experience connectivity problems. Therefore, I would prefer that we continue with online learning. Therefore, participant 11's experience is quite different to other lecturers.

#### **5.4. Limited access to the network and shortage of data**

It is argued that during online learning network connectivity is a serious challenge that interrupts online learning. The sudden transition to online learning has presented both lecturers and students with several challenges.

Participants were asked to tell their experience when attending online.

Participant 14 indicated that,

"Whenever we attend online I always experience connectivity problems because where I am staying there is limited network access and I always miss lessons".

Participant 15 asserted that,

"Network connectivity is a serious challenge when we are attending online. Especially now when we are having load shedding. When the electricity is cut, the network cuts as well. Then if there is no network, we fail to attend online".

Participant 16 said,

“During lockdown, the university used to offer us data to connect but now it’s tough because we can’t afford data”.

### **5.5. The effectiveness and the challenges of online learning**

Numerous studies on the effectiveness of online learning have taken into account the challenges and restrictions that students may experience as a result. Some of these studies were conducted by Irfan and Iman, Wildana, Iffat, Eva, & Zainur, Adnan & Anwar, AlIrfan and Iman asserted that virtual learning is unsuccessful and carried out improperly.<sup>34,35</sup> They use several issues to highlight this, such as poor internet connection, instructors' inability to implement virtual learning and disobedient students.<sup>36</sup>

Learning online is efficient yet ineffective.<sup>37</sup> In response to the pandemic's urgency, they acknowledge the beneficial effects of online learning, but their educational goals cannot be met because it is costly to purchase adequate internet packages. Furthermore, online learning is effective because it makes it simpler to use programs like "WhatsApp," "Zoom," and "Google Classroom."<sup>38</sup> However, Wildana et al. also acknowledge that the availability of the internet and internet bundles limits the efficacy of online learning.

The problems with access to the Internet, a lack of participation by students in lectures, and a shortage of technology tools all reduce the efficiency of online learning.<sup>39</sup> A study conducted by Hazwani Mohd, Noor Raudhiah Abu, & Norziah, found that an institution's infrastructure is essential to the smooth operation of online learning. Insufficient facilities will limit students' access to

---

<sup>34</sup> Irfan F, and Iman Hermawan, ;Teachers Elementary School in Atas Talian Learning of COVID-19 Pandemic Conditions (2020)202 Jakarta. Jurnal Iqra 95

<sup>35</sup> Wildana W, Iffat M, Eva D, and Zainur R, ‘Student's Responses on Learning in the Early COVID-19 Pandemic’ (2020) 14 Journal of Education and Teacher Training 211,216

<sup>36</sup> Adnan M, and Anwar K, ‘Online Learning amid the COVID-19 Pandemic: Students' Perspectives’ (2020)2 Online Submission 45,51

<sup>37</sup> Basar Z.M, Mansor A.N, Jamaludin K.A,and Alias B.S, ‘The effectiveness and challenges of online learning for secondary school students–A case study’ (2021)17 Asian Journal of University Education 119,129

<sup>38</sup> Ibid, 211-217

<sup>39</sup> Ibid, 45-52

the internet. The studies listed above show that there are some circumstances in which online learning is advantageous. However, bringing virtual learning into practice still has its issues and challenges.

## 6. DISCUSSION

The higher education sector was unprepared to switch from physical to online learning when the COVID-19 pandemic in Africa struck, which took them by surprise. Even though the education sector has been embracing digital technologies, the development was slow.

The results presented by the respondents correspond with the results found by Molosankwe, in the study called "UJ students reject planned online learning to start next week," asserting that some students at the University of Johannesburg in South Africa denied the virtual classes that were set to start at the time of the announced national lockdown because they believed the online system was designed for wealthy individuals and that the less fortunate would be disadvantaged as a result.<sup>40</sup> The concern among students was that taking part in online learning would be prohibitively expensive for many of them. However, practically all South African higher education institutions, if not all of them, use online learning to carry out their studies and some other academic institutions prefer online learning than face-to-face.

However, based on the findings presented above, it is difficult for other institutions of higher learning, especially rural-based academic institutions to conduct virtual learning because they have limited networks in their villages. The fact that online learning to be successful requires several factors stated by Onyema, Eucheria, Obafemi, Sen, Atonye, Sharma & Alsayed argued that several factors, including reliable internet connections,

---

<sup>40</sup> Ibid, 17 April 2020

instructional software, digital skills, and access to technology, are necessary for online learning to be successful.<sup>41</sup>

One may argue that the goal of online learning is to meet the educational needs of certain students who do not have the time or want to enrol in full- or part-time learning in traditional classroom settings. However, for online learning to take place, effective preparation and sufficient pertinent resources are required. Most of the academic institutions in Africa had little choice but to adopt online learning when schools reopened amid the national lockdown's loosened restrictions. However, it is demonstrated by Mukute, Francis, Burt, & de Souza that certain educational institutions lack the necessary tools and resources to keep up with the new kind of learning.<sup>42</sup>

### **6.1. Literature and Interpretation**

It is preferable if academic institutions already have sufficient facilities and resources for them to accept and employ digital learning in educational operations. For instance, the absence of various resources is a common issue with e-learning adoption. Based on resources and income, developing nations spend more on higher education than more developed nations.

However, the lack of understanding and proficiency in using the technology tools that they are provided within their educational practices is one issue that has been mentioned by both instructors and students. Many studies contend that training, including using computer classes, is necessary and must be provided for digital learning to be truly advantageous for students as well as instructors in higher education. Bates supports the arguments by pointing out that it costs time and money to adjust to such new work routines and learn ways to use the latest technologies.<sup>43</sup> However, in order to benefit from the advantages of e-learning, Bates contends that such precautions are essential.

---

<sup>41</sup> Onyema E.M. Eucheria and others 'Impact of Coronavirus Pandemic on Education' (2020)11 *Journal of Education and Practice* 108

<sup>42</sup> Mukute M., Francis, B., Burt, B. and de Souza, B. Education in Times of COVID-19: Looking for silver linings in Southern Africa's educational responses. *Southern African Journal of Environmental Education*. (2020) 16, 78.

<sup>43</sup> Bates T, 'National strategies for e-learning in post-secondary education and training' (2001)70 *Fundamentals of Educational Planning* 92

The institutions of higher learning in underdeveloped countries do not think that highly advanced technology tools (such as computers, laptops, etc.)<sup>44</sup> are trustworthy enough to be adopted as effective educational tools. It is believed that these institutions of higher learning generally believe that using such tools would be problematic and expensive.

The decision to introduce online learning in higher education comes with some obstacles because it alters work schedules for both students and lecturers.<sup>45</sup> In addition, several considerations must be made before digital learning may be used in education from the perspective of developing nations: The introduction of innovative teaching and learning techniques in higher education necessitates the need for staff development.<sup>46</sup> It is essential to take training and conversation about these novel approaches seriously because some problems need to be addressed and handled with caution. It is anticipated that the usage of e-learning in traditional educational environments will have a variety of implications on organizational landscape and activities.

When employing distance learning for colleges and universities, it's also important to acknowledge that many institutions in underdeveloped countries lack the three things that are essential for their fulfilment: access to a top-notch faculty, dedicated and well-prepared students, and appropriate resources. Lecturers in several developing nations lack sufficient expertise in the subjects they are teaching. Additionally, students do not have access to innovative or adaptable digital learning tools.

There are definite signs that some developing nations are already battling issues with their institutions. These problems are probably not favourable to academic institutions' efforts to increase or include distance learning in the system of education.

---

<sup>44</sup> Galusha J. M, 'Barriers to learning in distance education. Hattiesburg' ( MS: University of Southern Mississippi, 1997)

<sup>45</sup> Mapuva J, and Muyengwa L, Conquering the barriers to learning in higher education through e-learning. (2009)<sup>21</sup> International Journal of Teaching and Learning In Higher Education 221,227

<sup>46</sup> Stödberg U, and Orre C J, 'It's not all about video conferencing' (2010)<sup>27</sup> Campus-Wide Information Systems, 109, 117

The findings of this study demonstrated that the combined impact of the 4IR and the Covid-19 outbreak had compelled academic institutions to change both the way they run their operations and how they improve the skills of their workforce. Abilities that were not necessary in the workplace before COVID-19 are now necessary to communicate in digital interactions. The training methods used by higher education institutions had to be reconsidered, along with the knowledge and abilities that their staff members would need to thrive in the 4IR era of learning and teaching that will eventually be implemented.

Therefore, it is crucial to take into account some core skills that are required for 4IR, including digital readiness, soft skills, technical skills, and entrepreneurial abilities, among others. Programming abilities, the ability to read failure signals, quality control, maintenance duties, etc, are all necessary for professional competence. Personal qualities include dependability, stress management, and critical thinking.

Team meetings are no longer held within the confines of a boardroom, but rather within the confines of your study, dining room, etc., using digital platforms. The argument of being technologically uneducated is no longer acceptable for employees who have to upgrade their skills on these new digital platforms.

Africa needs to embrace 4IR to benefit from its potential, which we might not have previously acknowledged before the COVID-19 outbreak, to effectively take full advantage of the new opportunities presented by it.

## **7. CONCLUSION AND RECOMMENDATIONS**

This research seeks to determine whether COVID-19 indeed transitioned education to 4IR, where learning will primarily be digital with occasional face-to-face interactions. Thus, based on the analysis of this paper, the study concludes that educational institutions are not fully ready for virtual learning because a large number of African academic institutions are still having trouble acquiring the Fourth Industrial Revolution tools required for offering online learning. Furthermore, network connectivity is still a serious challenge in Africa. Therefore, when online classes

are being conducted, students and lecturers always lose communication due to the limited network. Additionally, students who are from poor background families are the ones suffering more than those who are from rich families. The adoption of virtual learning requires the institution of higher learning that have all basic 4IR tools because it doesn't have all the necessary tools to conduct online learning and therefore, the majority of students will not perform.

As a result, the report recommends colleges and universities must create a framework for equitable use of technology which consists of an accessibility and engagement strategy to ensure that lectures and students possess the required digital literacy, awareness of key aspects of the digital world, and the ability to participate in online learning environments. However, blended learning should be embraced in the future since it offers the education sector various ways to begin incorporating 4IR, which can help the sector keep up with 4IR-related advances. A level playing field must be ensured by tackling concerns with inequality, a lack of skills, and the massive digital divide.