

## A Reflection on the Impact of Covid-19 on Addis Ababa University Education

Getachew Adugna<sup>1</sup> and Tolera Simie<sup>2</sup>

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**Abstract:** *The impact of the Covid-19 pandemic on Western higher education institutions has been extensively reported. However, there appears to be a major gap in understanding the effects of the pandemic on university education in some sub-Saharan African countries. The purpose of this qualitative study is to bridge this gap by exploring teachers' and students' experiences of emergency remote teaching and learning necessitated by COVID-19 at Addis Ababa University (AAU), Ethiopia. Qualitative questionnaires were used to gather data from six postgraduate students studying at different departments three instructors, and three university officials all based at the College of Social Science of AAU. Data was analysed using the qualitative content analysis method, and NVivo software was used to code and manage the analysis of the data. The finding of the study showed that internet connectivity, lack of institutional support and lack of access to appropriate technological devices as some of the major challenges that students and teachers experienced during remote teaching and learning. These challenges highlight a digital divide among students and teachers. Those with limited or no access to a stable internet connection face disadvantages in participating fully in online learning activities. The findings may suggest a need for improved infrastructure, including reliable internet access, to support online education. This could involve collaborations between educational institutions, government agencies, and internet service providers to enhance connectivity. Although this study was on a small scale, the results have a significant implication for the future of online university education in Ethiopia and Sub-Saharan African countries.*

**Keywords:** *Covid-19, Ethiopian higher education, remote learning, Addis Ababa University, online classes, connectivity*

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<sup>1</sup> Assistant Professor, Department of Curriculum and Instruction, College of Education and Behavioural Studies, Addis Ababa University- Ethiopia. Email: [getish1958@yahoo.com](mailto:getish1958@yahoo.com)

<sup>2</sup> Tolera Simie, PhD candidate, University College London, Institute of Education, UK. Email: [t.simie@ucl.ac.uk](mailto:t.simie@ucl.ac.uk)

## Introduction

The Coronavirus 2019 (COVID-19) pandemic created significant challenges for global higher education institutions. While university campuses shut their doors to mitigate the spread of the pandemic, teaching and learning transferred from physical classrooms to online classes. The challenges of switching university education to emergency online teaching are multifaceted in the context of Africa. Underdeveloped technological infrastructure combined with a shortage of skilled ICT specialists can have detrimental effects on online education. As the remote teaching-learning process has become more prevalent during the COVID-19 pandemic, it becomes particularly important to know whether remote learning has helped students achieve their educational goals.

In March 2020 the Government of Ethiopia decided to close all educational institutions including universities to curb the spread of Covid-19 in the country. The decision affected over 26 million primary and secondary school students and around one million tertiary-level students (UNESCO, 2020). Learning and teaching in primary and secondary schools have continued through radio and television with limited success. However, in higher education in the absence of face-to-face instruction, the government invested in the creation of an online depository where all undergraduate students can get access to and retrieve resources related to their field of study for independent learning (Mikyas, 2020). The move favoured only some students living in urban areas whereas most students in the rural part of the country have no access to relevant devices and reliable and affordable internet connection were disadvantaged in accessing online education.

However, authorities in Ethiopian higher education have assumed that both teachers and students have the skills and knowledge that enable them to manage the challenges of coping with remote teaching and learning. The current study takes this assumption as a topic for

further investigation to understand stakeholders' (students and teachers) online lived experiences during the pandemic. The subjects of the study are the postgraduate students at Addis Ababa University (hereafter AAU) as no online teaching provision was made for the undergraduate programmes at the university. This study aims to contribute to our understanding of the challenges and opportunities of online teaching and learning in the current research setting and beyond.

### *Why Addis Ababa University*

Established in 1950 with the initiative of Emperor Haile Selassie, AAU is the first modern higher education institution in the country (Amare, 1988). Although Ethiopia escaped the influence of colonial powers and owns a well-developed language with its writing system used in traditional education in the past, English was adopted as a medium of instruction in the newly established university college (Tolera, 2022).

During the first decade of its inauguration, participation in the new university was limited to the privileged section of the society and enrolment rate remained as low as 0.2% (Germa, 1988). However, over the last two decades, AAU has significantly expanded (Damtew, 2015) offering hundreds of undergraduate and postgraduate programmes to over 51,000 students. Located in the capital city of the country, AAU has fourteen campuses, and it has the biggest enrolment among all the higher education institutions (hereafter HEIs) in Ethiopia (Elizabeth, 2017). In its fourteen campuses, the University runs seventy undergraduate and 293 graduate programs (72 PhD and 221 Masters), and various specializations in Health Sciences. As a flagship university, according to Damtew (2015), AAU has played a significant role in producing the largest number of graduates, research and publications in capacity building and innovation endeavours. Since its inception, the University has been the leading centre in teaching-learning, research and technological advancements.

In terms of embracing educational technology, AAU is one of the forerunners in attempting to integrate information, communication and technology (hereafter ICT) into the teaching and learning process (Mikyias, 2020). To this end, the university established an ICT Directorate with the mission of providing technological infrastructure that expands and enhances teaching and learning. Hence, it offers an opportunity to assess the changes and challenges the University faces in providing online teaching and learning at the time of the global pandemic.

#### *Purpose of the Study*

Following the closure of university campuses AAU, the oldest and biggest university in the country, was one of the first HEIs to announce the transfer of some of its postgraduate classes to remote learning. However, according to Abebaw (2020), the news was not well received by the teachers at the institution as they were not consulted and most importantly they worried about their skills and experiences of online teaching.

The current study seeks to explore gaps in the provision of access to digital education at AAU for which the result of the study may have an implication for HEIs in Ethiopia and SSA countries in general. The purpose of this study is to explore students' and teachers' experience of online learning during the closure of universities due to fear of COVID-19 spreading in the country. Through qualitative questionnaires, the study attempts to understand and describe major challenges and opportunities experienced by postgraduate students during online learning at AAU.

This study intends to answer the following research questions:

- What are the major challenges faced by AAU students and teachers during the emergency period of remote teaching and learning established due to the spread of COVID-19?

- What institutional support (if any) did the students and teachers receive from the university before and during the remote learning and teaching?
- How do students and teachers perceive their experiences of remote learning and teaching during the pandemic?

These research questions are framed based on the review of literature related to online education in the context of a pandemic and the role of ICT in enhancing teaching and learning remotely.

#### *Rationale*

The impact of the pandemic on Western higher education institutions has been extensively reported (see e.g., Lovrić et al., 2020; Murphy, 2020; Williamson et al., 2020). However, there appears to be a major gap in understanding the effects of the pandemic on university education in some SSA countries. The present study is designed to explore the challenges and experiences of postgraduate students and their teachers during the emergency remote teaching and learning established at AAU, one of the biggest postgraduate programme providers in Ethiopia. Despite significant improvement in the use of computers and smartphones in educational settings in Sub-Saharan Africa, there is scarce research on the use of technologies in education.

A research report by scholars from Cambridge University that has systematically analysed over 1650 publications in the African Education Research Database (see Rose et al., 2019) identifies that ICT was the least researched area in the SSA education system. Few research that exists in this setting concentrates mostly on the use of ICT for information management rather than for teaching and learning purposes. In other words, there is a paucity of research work on ICT and online teaching and learning in the context of SSA countries, including Ethiopia. This study intends to fill in this gap by exploring the

challenges and opportunities ICT created at AAU while providing online education at the time of the Covid-19 pandemic.

### *Operational definitions*

*COVID-19*, which stands for "Coronavirus Disease 2019," according to the World Health Organisation, is a highly contagious respiratory illness caused by a novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).

*Remote/online learning and teaching* – refers to the teaching and learning that takes place when students and instructors are not physically present in the same location. Instead of traditional face-to-face interactions in a physical classroom, remote learning and teaching leverage technology to facilitate education from a distance. The terms *remote learning* and *online learning* are used interchangeably in this study.

*ICT* – refers to the use of digital technologies and electronic communication tools to enhance and support teaching, learning, and educational management.

*Connectivity* - refers to the capability of different devices, systems, or entities to establish a connection and communicate with each other. Connectivity can occur through wired or wireless methods and is crucial for the functioning of interconnected systems, enabling communication and data transfer.

*Institutional support:* refers to the various resources, services, and structures that an educational institution provides to facilitate the academic success, personal development, and overall well-being of its students and staff.

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## Literature Review

### *Technology in Education*

In modern HEIs where ICT is combined with an appropriate level of pedagogical practices, online classes can enhance knowledge construction through collaborative learning (Lock & Redmond, 2021). As Behnagh and Yasrebi (2020) state educational technology is developed in line with the principles of social constructionist theory of learning, which implies that technology can support learning in which learners can collaborate to co-construct meaning in an online environment. In this regard, the use of the Internet becomes essential to continue teaching and learning at the times of lockdown and social distancing due to the Covid-19 pandemic.

In advanced economies where technological infrastructure is already in place going online for teaching and learning academic subjects does not appear to be a big change for many HEIs in such contexts (Ali, 2020; Sahu, 2020). For instance, the use of Moodle – a virtual environment used to host teaching and learning, manage assignments and facilitate interactions between students and teachers remotely – is a widespread practice in many Global North universities and colleges.

Societies with better access to technology benefit most from getting access to digital education and vice versa. On the contrary, however, the lack of access to educational technology for formal and informal learning has created inequalities in societies in the Global South. To bridge the gap policymakers should consider improving access by designing technological infrastructure that facilitates an equitable future ((Selwyn et al., 2020). Likewise, HEIs in SSA countries have started implementing the policy of online delivery (Kotoua et al., 2015), but still lack the resources to make use of the programme to its maximum potential.

Depending on the availability of a well-integrated ICT, online platforms can help deliver quality university education to marginalized and widely dispersed students in Africa. However, the information network is limited to certain geographical locations as access to ICT is concentrated in urban areas (Lembani et al., 2020). This is certainly the case in Ethiopia where only a small proportion of the population has access to technological devices and the Internet.

According to Kemp (2020), only 19% of the population has access to internet in Ethiopia. The digital divide between students in bigger cities and those living in rural areas appears to have widened an already existing inequality of education in the country. Owing to the excessive cost of internet data and computer devices many families cannot afford to pay for remote learning. Only a small fraction of students from socio-economic backgrounds who can afford such technology have access to remote teaching and learning during the pandemic (Young Lives (2020). Researchers in the Ethiopian context argue that unless financial assistance is provided from the government to cover the cost of accessing online platforms, including the internet and computers (see, e.g., Wondwosen Tamrat, 2021), the educational gap between students in better-resourced and under-resourced universities is likely to widen at the time of Covid-19 pandemic, which can contribute to social inequality.

### *ICT in Ethiopian Higher Education*

Integrating ICT into teaching and learning in HEIs is on the increase across the globe (Ali, 2020; Martin et al., 2019). Similarly, as technological devices such as smartphones become widely available in SSA countries, the blending of technology with teaching and learning in African higher education is gradually growing with the potential to improve the quality of education in the continent (Maekopo, 2017). However, owing to resources constraints including human capital and ICT infrastructure, supporting teaching and



learning with ICT remains one of the challenging issues for HEIs in SSA countries.

In universities in low-income countries like Ethiopia, the implementation of ICT for pedagogical purposes is not sufficiently developed (Ergado, 2019). The use of technology in education has only begun to emerge in Ethiopia. According to Ergado, the lack of a clearly stated ICT policy and the shortage of skilled faculty members appeared to be some of the major challenges for integrating ICT into the teaching and learning practices in Ethiopian HEIs in the past.

However, ICT and technology transfers have been given considerable attention in the fifth higher education policy document called the Education Sector Development Programme, ESDP V (MoE, 2015). In this policy document, the government states its ambition to connect all schools and HEIs with the internet and integrate ICT into the curriculum of the higher education sector highlighting the importance of ICT use in education to raise the quality of teaching and learning. According to the ESDP V policy document, “to boost an e-learning culture among students and teachers and to improve the alignment of digital resources with curriculum, digital content will be developed for all curriculum subjects” (MoE, 2015, p. 70). As a result of the policy, according to Mikyas (2020), most higher learning institutes manage to provide basic ICT support for teaching and learning on their campuses.

Ethiopia’s ICT policy is based on the country’s aspiration to transform the country into a digital economy and become a middle-income country by 2025 (MoE, 2015.). Currently, there are two technology universities (Adama and Addis Ababa) dedicated to the advancement of science and technology that facilitate the transformation of the country into a knowledge-based economy by training and producing technologically skilled graduates. In addition, first-generation universities such as Mekelle, Jimma and Bahir Dar, according to Wondwosen and Damtew (2021), are at the forefront of integrating

and enhancing teaching and learning through ICT, producing technologically skilled human capital that contributes to sustainable economic growth and poverty alleviation in the country.

However, while a few universities with better technological infrastructure are concentrated in bigger cities, some universities in the remote part of the country have no access to fully integrate technology into their education system. For instance, eleven recently established universities and their student population are in rural parts of the country in places where access to technological devices and connectivity are limited. Nevertheless, the provision of distance learning has recently grown at Ethiopian universities (Boateng, 2020). According to Boateng, both private and public universities have been playing a significant role in providing distance education at diploma and degree levels.

#### *The Impact of COVID-19 on Education in Ethiopia*

Research related to COVID-19 has reported the impact of the pandemic on education around the globe. The emergency transfer of classes from physical settings to online environments presented challenges as well as opportunities for students and teachers. In contexts where ICT infrastructure existed before the spread of the pandemic, online teaching and learning created opportunities for students to get access to resources available on the internet (Selvaraj et al., 2021). It has also been reported that virtual classes help students develop effective use of technology, develop digital and time management skills. Furthermore, students and teachers have benefited from increased flexibility in terms of scheduling online meeting times (Lall & Singh, 2020).

However, the lack of sufficiently developed ICT infrastructure in most SSA countries forced educational institutions to close their doors to millions of students due to the spread of the pandemic. Although the full impact of COVID-19 on education in Africa has not yet been fully

researched, some indications existing poor quality of education in African HEIs has been exacerbated by the spread of the pandemic. The findings of a survey that involved over 500 individuals in African universities indicated that about 83% of the institutions in the region experienced interruption of teaching and learning, of which only 38% offered remote learning (The Mawazo Institute, 2020). This implies that millions of university students have lost valuable time in their education without formal educational activities.

When the first COVID-19 case was confirmed in Ethiopia on 7 March 2020, the government quickly identified schools and universities as potential transmission sites and decided to close educational institutions. According to UNESCO, the pandemic disrupted the education of over 26 million students in Ethiopia (UNESCO, 2020) of which nearly a million students were tertiary-level students. HEIs which include over 50 government-funded universities and 250 private academic institutions were affected by the spread of the pandemic. Following the closure of schools and universities on 16 March 2020, the MoE gave directions on how teaching and learning should proceed in the absence of face-to-face meetings (Wondwosen, 2021). While secondary schools turned to television and primary schools to radio for accessing learning remotely, public universities were instructed to set up online teaching programmes to continue the provision of lessons remotely.

According to Wondwosen and Damtew (2020), transferring to an online modality has been a huge challenge in the Ethiopian context because of limited access to the internet and the technical skills of teachers and students to engage in the new environment. As a result, only a handful of HEIs have used social media platforms such as Zoom, Google Classroom and Telegram to deliver online classes.

From the onset of the pandemic, Ethiopian HEIs, which have already experienced a deteriorating quality of education (Tirussew et al., 2018), faced unprecedented challenges including regular power

interruptions as all universities had to shut their doors to a million students and attempted to go online. As if the impact of COVID-19 was not enough, conflicts in different parts of the country created a setback in the economic and educational achievement recorded in the country. Thus, the spread of COVID-19 brought new challenges to the already struggling education system where the already deteriorating quality of provision (Tirussew et al., 2018; Tolera, 2022) further widened the inequality of education. To raise the standard of education, teachers needed to be well-equipped with digital and pedagogical skills.

Online teaching, distance education and remote teaching have existed as a pedagogical approach for quite some time, but following the COVID-19 pandemic they become more visible in educational establishments around the world (Williamson et al., 2020). However, the high demand for switching to emergency online teaching in a short period where tools and resources are in short supply puts university teachers under immense pressure. As universities look to technology to transfer students to online classes, policymakers realise that not everyone is digitally savvy.

Teachers' technical and pedagogical preparedness is the key to online quality delivery. Computer self-efficacy, learners' and teachers' ability to accomplish tasks using computers, and internet self-efficacy, the ability to organise and execute internet-related activities are essential skills to elicit the desired results in the online learning environment (Kuo et al., 2021). To achieve this objective, good online educational institutions provide their faculty with high-quality pedagogical training that goes beyond the simple use of technology in online teaching (Kukulaska-Hulme, 2012; Palloff & Pratt, 2010).

However, in some contexts, teachers are rarely provided with pedagogical developments that enable them to teach online effectively. A survey conducted to investigate African educators' experiences with the use of technology during the pandemic reported

that 71% of the respondents indicated that lack of appropriate training was one of the major obstacles to effective online delivery (EdTech, 2020).

In Ethiopian HEIs, owing to a lack of ICT-skilled teachers, university graduates appear to be 'taught using chalk and talk methodologies by non-specialist and under-qualified staff (Ashcroft & Rayner, 2011), which hurts the quality of graduates' educational outcomes. According to Palloff and Pratt (2010), however, online teaching requires the skills of creating a learning community in which students engage in collaborative learning through group discussions. In other words, for effective online teaching, teachers need to move beyond the traditional lecture method for active learning to take place.

### *Students' Challenges*

The COVID-19 pandemic has disrupted the education of students in HEIs around the world. However, students in SSA including Ethiopia are likely to be the most vulnerable to the pandemic as digital infrastructure in many universities is not sufficiently developed to support remote learning (Lone & Ahmad, 2020). In the case of Ethiopia, all public universities are residential which means students rely on universities for housing, food and educational resources including IT equipment and internet connection. After the closure of the universities, students were offered free internet, but not devices, to get access to online academic content from government website repositories for independent learning (Mikyias, 2020).

However, in a country where a spare study room with an internet connection and technological device is a luxury for many households, the plan benefited only students from affluent backgrounds. As the World Bank report indicates the impact of Covid-19 on equity and quality for a large group of higher education students, where internet penetration is insufficient or zero, has been enormous (O'Malley, 2020). In Ethiopian universities, undergraduate students *with* internet

access were expected to make use of learning materials from government repositories, but the process of learning did not involve the subject teachers or peers.

Whether learning takes in physical classrooms or in virtual spaces, it involves collaboration for learners to build knowledge through discussions in the learning resources (Behnagh & Yasrebi, 2020). For students to fully engage in online learning, faculty members need to provide students with immediate feedback through e-mails or video tutoring (Bao, 2020; Janssona et al., 2021). Thus, to make online learning fruitful and effective teachers and students' regular interaction is vital.

## **Research Methodology**

### *Setting and Design of the Study*

The setting of the current study is AAU. AAU was chosen for this research because it is not only the first to go online due to the pandemic, but it is also the biggest provider of postgraduate study programmes in the country. The data for the study was collected from the university's stakeholders of three different levels: students, instructors and academic heads. The study employed qualitative questionnaires as data gathering, and the qualitative content analysis (QCA) method was used to analyse the data. NVivo, qualitative data analysis software, was used to code and enhance the analysis of the data. In short, this small exploratory research is designed to unveil and reflect on salient challenges experienced by postgraduate students and their teachers at AAU during the emergency remote learning and teaching forced by the closure of universities due to the spread of the COVID-19 pandemic.

### *Study population*

The study seeks to explore the three research questions through qualitative questionnaires that involve six postgraduate students,

three university instructors and three officials at Addis Ababa University. Convenience sampling was used to recruit participants for the current study. Convenience sampling is a sampling method chosen by the availability and accessibility of participants to the researcher (Bryman, 2016). As one of the researchers of the current study is a lecturer who teaches at the postgraduate level at the current research site, it was practically convenient for him to recruit potential research participants. Additionally, as this is an exploratory study, convenience sampling appears to be the best fit for exploratory study (Andrade, 2021).

The sample population included six postgraduate students (five at masters and the other at PhD level) and three instructors based at the Social Science College of AAU. Three academic heads were also included to get some insights into the provision of institutional support for faculty members and students. To ensure sufficient diversity of opinion among groups, participants were selected from various departments of the Social Sciences College of AAU. The participants were recruited from a range of departments of postgraduate programmes – Amharic, Accounting, Curriculum and Instruction, Health/pharmacognosy and Sport. Undergraduate programmes were not included in this study as no online provision was made for students on these programmes at this university during the pandemic.

#### *Data Collection Method*

The study employed qualitative questionnaires to explore, through open-ended questions, the participants' experiences of remote learning and teaching at Addis Ababa University. Qualitative questionnaires in which participants responded to open-ended questions by writing or typing their responses were commonly used to gather data (Connor Desai & Reimers, 2019). As opposed to closed-ended questions, in open-ended questions, participants are likely to freely share their experiences in their own words providing rich and relevant data for the study. One of the greatest advantages

of open-ended survey questions is that they provide each respondent with a 'sense of individuality' allowing them to express personalised issues related to the phenomenon under investigation (Allen, 2017), which implies that individualised responses are likely to provide diversity in the data gathered.

Bearing this in mind, the researchers of the current study formulated open-ended questionnaires based on the themes of the research questions. To get various perspectives on the phenomenon being studied, data for the current study came from stakeholders' postgraduate students, instructors, and university officials based at AAU. The teachers and students' questionnaires contained fifteen items and questionnaires of ten items were sent to the university officials (academic deans). A separate questionnaire was prepared for university officials to make clear their approaches to the challenges of online classes and to get some insights into the kinds of institutional support offered to students and teachers before and during remote teaching and learning.

To maximise the validity of the content of the instrument used to gather the data for this research, in addition to receiving feedback from a qualitative research expert, two more steps were followed. First, the questionnaire items were grounded in the themes identified in the literature review above. In other words, after conducting a thorough review of existing literature related to online learning during the pandemic, the questionnaire items were formulated based on the main themes and the constructs identified in the literature review that helped explore participants' experiences, challenges and opportunities during online learning.

Additionally, to ensure the content validity of the instrument, the questionnaire went under rigorous review several times. Through regular team meetings, the authors conducted a collaborative review through open discussion to address any concerns regarding the clarity and relevance of the questionnaire items, which helped to



address ambiguous questions and to ensure the questions aligned with the research objectives. Furthermore, the questionnaire items based on the feedback received from a qualitative research expert were further refined.

After reviewing and refining completed, questionnaires were emailed to the participants by one of the authors of the current study who was based at the current research site. Ten of the participants gave detailed responses to the questions asked in English, but only one provided his responses in an extended text written in Amharic, which had to be translated into English for analysis. Another respondent provided audio-recorded responses in Amharic which was transcribed and translated to English.

### *Ethical Considerations*

For the purpose of anonymity, we referred to the postgraduate students as *student 1, student 2...* and the instructors are referred to as *instructor 1, instructor 2 ...* and the university officials as *uni official 1, 2 ...* Participants who volunteered to participate in this study were initially contacted through e-mail and they were made to know details about the purpose of the study. Prior to sending out the questionnaires, consent forms were sent out to them in which they were informed that their participation was entirely voluntary, and they could withdraw from the study at any time if they wanted to do so. They were also informed that their contributions to this study would remain anonymous, and their responses to the questionnaires would only be used for this research purpose. Their identity would be kept confidential in the writing of the current research report and any future publication of this study.

### *Data Analysis Method*

The study used the qualitative content analysis (QCA) method to create themes by analysing patterns that emerged from the data.

Content analysis can be used in all types of written text (Bengtsson, 2016) including interview transcripts and open-ended questions as in questionnaires. As Selvi (2020, p. 442) explains QCA allows for “subjective interpretation of the contents of both qualitative (assignment of categories) and quantitative (the use of text passages and analysis of frequencies of categories) steps in a systematic and context-dependent manner”. In a similar token, in this study QCA is defined as a method of analysing and interpreting the content of text data through the process of systematic coding, identifying word frequency and categorising patterns and establishing emerging themes. Qualitative data in the form of responses to open-ended questionnaires can be analysed by observing the frequencies of variables in the data. Hence, QCA is unique as it allows data to be analysed (Bengtsson, 2016) both qualitatively and quantitatively through inductive or deductive analysis.

To achieve this, data management and coding for this study were performed using NVivo, qualitative data analysis software. Using NVivo for qualitative data analysis minimises researchers’ bias and enhances analytical transparency in the process of coding (assigning labels to parts of the data), analysing and searching for emerging themes (Kaefer et al., 2015). Similarly, NVivo software allows us to create new codes from the participant data, and then review the codes, search for high-frequency terms in the data compare and contrast commonalities and differences among the codes.

Before we began our analysis, we read each respondent’s data several times and annotated the data with our notes and comments to get familiar with the contents of the participants’ data. Then, the data was cleaned (removed irrelevant variables) before importing it into NVivo. Next, for each group of our respondents (students, teachers, officials), we created three different folders on NVivo and we transferred the data accordingly. Then initial coding of the data was conducted inductively in which we identified salient contents relevant to the research questions and then assigned codes. After we

completed the initial coding of all the data, we ran a word frequency query in NVivo to identify high-frequency terms in the coded data. In the next stage, the coded data were reviewed and categorised according to emerging patterns of commonalities and differences among the codes.

Using different features and visualisation tools available on NVivo, the data were iteratively interrogated – repeating the above procedures multiple times and in multiple ways - which helped to increase the rigour of the data analysis process. In the final phase of the analysis, identifying and categorising patterns in line with the research questions, salient themes were identified. Thus, key themes that emerged from the analysis of the data and discussion of the findings are presented below.

## **Results and Discussion**

The findings and discussions of the study are framed in line with the research questions. The research questions were designed to understand the experiences, challenges and opportunities of online classes necessitated by the spread of COVID-19 at AAU. Through qualitative questionnaires, the study explored stakeholders' lived experiences related to access to technological devices, connectivity, and their perceptions of the quality of remote teaching and learning at the university during the pandemic. The data of the study was analysed and categorised into major themes using the qualitative content analysis method – an analysis method that allowed combining quantitative and qualitative interpretation of data. NVivo software was used to code and analyse the data. The result of the study and the discussion in which the result is interpreted will be presented in the next section.

### *Major Challenges Teachers and Students Experienced*

Initially, the analysis of the data produced several themes and sub-themes related to participants' experience of remote teaching and learning. However, by reviewing the codes and themes iteratively, the findings of the analysis were condensed into five major themes, in which descriptions were given for each theme as shown in figure 1 below. The data shows that challenges related to connectivity appeared as the top theme of the analysis as it received the most references from the respondents in the study.

In the search for answers to RQ1 (what were the *major challenges that participants experienced during remote teaching and learning*) the analysis of the data unveiled salient issues related to internet connection, power interruption and lack of appropriate technological devices and interaction during classes experienced by both the postgraduate students and their teachers during the Covid-19 pandemic (for major themes created from the data see figure 1 below). This finding illustrates major themes identified in the data and descriptions given for each theme including the number of files and references associated with them.

Themes	Description	Files	References
Connectivity challenges	This code represents the challenges participants experienced with an internet connection including weak and unreliable connection, internet cost and interruption of internet services during remote teaching and learning.	12	101
Institutional support	This code represents any kind of support that the university provided - including technological and pedagogical pieces of training and provision of devices - that help mitigate the challenges of remote instructions.	12	60
Participants' perception of remote delivery	This code represents how stakeholders perceive their experiences of remote learning and teaching during the pandemic.	12	43
Preparedness for online teaching and learning	This code represents institutional support including pedagogical and digital training offered before and during the online classes.	11	35
Quality of online teaching and learning	This code captures the quality of remote teaching and learning in the eyes of the stakeholders - the students, teachers, and university officials.	12	41

Figure 1: Codebook illustrating major themes and their descriptions.

In the analysis of the data, all the respondents experienced connectivity problems. As indicated in the word cloud generated from participants' data using NVivo software (see Figure 2), the coded data showed that *internet connection* was a high-frequency term identified in the participant's responses.



Moreover, students in this study indicated that due to a lack of internet data, they had to travel to public places where free wi-fi was available to attend classes or access online materials and communicate with teachers electronically. In supporting the student's comment, one of the instructors stated that *the biggest challenge was for the students. They had to pay to get an internet connection. Besides, the cost they incurred, the service they received was poor.*

The constant interruption of electricity supply was another major challenge that both the students and their teachers encountered during the emergency online classes. A respondent commented on the frequent disruption of power supply and its consequence on accessing learning remotely. *Most of the time I use our university Wi-Fi and when there is no electric power or connection, I use my smartphone which costs me money.* The challenges that the students faced in participating in online instruction appeared to be multifaceted. Lack of access to computers and internet data combined with the shortage of electric power could add immense stress on students who want to get connected and continue their learning to graduate within the planned academic calendar.

The finding of the study is in line with a previous study conducted by Wondwosen (2021) which investigated the impact of Covid-19 on educational activities in Ethiopian private universities. Wondwosen (2021) reported several major issues affecting the transfer of teaching and learning to online modality in Ethiopian HEIs. Students and teachers' lack of access to technological devices, poor connectivity, inflated cost of the internet and constant power interruptions, which were in line with our findings, were some of the salient challenges for conducting online delivery in Ethiopian universities. A similar study conducted in South African universities also reported that 46% of HEI students faced challenges when participating in online learning due to a lack of access to devices or internet data (Schalkwyk, 2021). Thus, students' lack of access to technological devices and reliable internet connection are not isolated issues. These important components of

online education seem to be in short supply in many parts of SSA countries (EdTech, 2020). However, for effective online delivery not only internet data and appropriate devices but also electric power is required for remote education at the time of the Covid-19 pandemic.

As Lembani et al. (2020) point out, although the Internet has become a widespread technological tool to advance teaching and learning in many contexts, its uneven accessibility in low-income countries has impacted the quality of education in HEIs. Students from better socio-economic backgrounds can have better access to technological resources to get access to online. A study by Young Lives (Young Lives, 2020), an international research group based in Oxford, reported that in Ethiopia only a small minority of students from the wealthiest family background have computers and access to internet while four in five (81%) have no access to the internet. This implies that many students from poor families may not be able to access online classes owing to lack of internet connectivity or technological devices, which implies that the effect of the pandemic can be much worse in economically the most vulnerable section of the society.

#### *Students and Teachers' Readiness for Remote Learning and Teaching at AAU*

In search for answers to RQ2, participants were asked if they received any kind of support from the university in the form of digital and pedagogical trainings, or technological devices before or during remote teaching. In the analysis of codes related to support or institutional support, all the student and teacher participants referred to the term *support* in their response to the questionnaire, but there was a variation among the respondents in terms of references made to the term, as shown in the graph below. Although all the participants made references to the term *support* in their responses, the term appeared most in the students' and teachers' responses.



We ran queries regarding the term *support* in NVivo to understand the sentiment of the study participants. In the analysis, many of the words used by the respondents demonstrated that insufficient or limited support was offered to prepare them for online delivery.

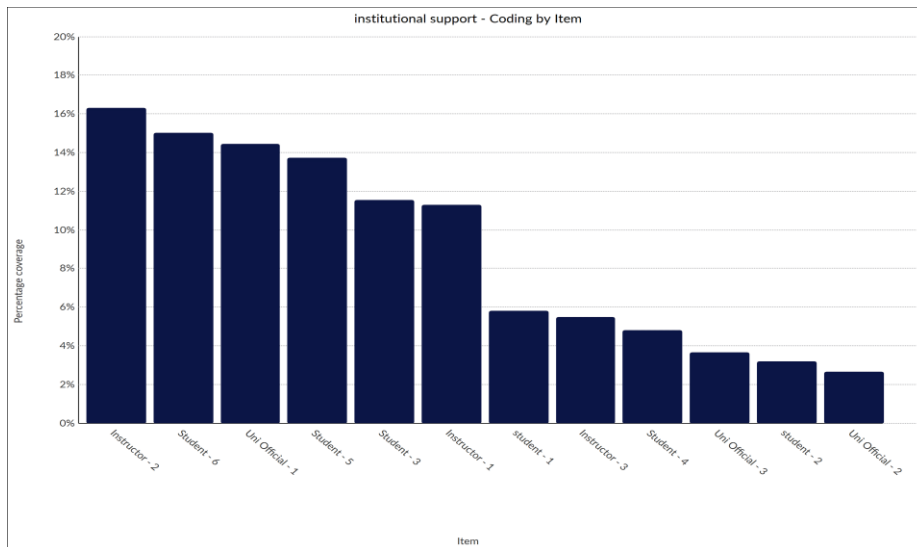


Figure 3: individual respondents' sentiment toward institutional support

Participants' responses with a more coded percentage of references show the provision of little or no institutional support. Hence, despite instructors and teachers lacking experience in remote teaching and learning, the university did not provide sufficient support in the form of pedagogical or digital trainings.

This can be summed up by the comments made by one of the respondents (Uni Official -1):

*Honestly, I did not see any institutional preparation to use online platforms. However, instructors conducted online classes, and*

*advised and examined students through Google Meet and Zoom just by their initiatives.*

Some participants also indicated that they used online platforms only for the first time when the modality was enforced by the closure of universities. A respondent commented *I have some experience in using the internet for searching and downloading data from different web pages, but this is the first time I used it for remote learning, I still prefer face-to-face to online classes.* The students and instructors at the university may have skills in searching data or communicating through e-mails. However, the study revealed a lack of online pedagogical skills and a lack of preparedness before transferring to online teaching and learning. Instructors could be highly skilled and knowledgeable in delivering their courses in the face-to-face modality. However, as EdTech (2020) pointed out delivering course content in an online mode requires specialist digital and pedagogical skills. Additionally, success in the use of ICT in education depends on teachers' willingness to embrace the pedagogical value that technology provides students to acquire skills for the 21<sup>st</sup> job opportunities.

To achieve these goals, before embarking on online provision, HEIs need to provide teaching staff with pedagogical training and technical support for effective online teaching and learning that can enhance learners' experiences (Ali, 2020). However, in its assessment of higher education institutions' readiness to deliver online teaching, the World Bank acknowledged that teaching staff did not receive training that prepared them for remote teaching and learning (O'Malley, 2020). The Bank stressed the need to provide teachers with technical training and support with internet connectivity and devices so that they could deliver online classes effectively. A study by EdTech(2020) which surveyed African teachers during the pandemic echoed a similar experience reporting teachers' lack of digital trainings that prepared them for effective online delivery.

Similarly, this study uncovered institutional failure in integrating quality ICT infrastructure that meets the educational needs of modern universities, and in providing the teaching staff with the support of digital and pedagogical skills and technological devices they require to deliver remote learning successfully.

### *Experience of Online Collaborative Learning and Teaching*

In our search for answers to RQ3, we analysed and compared respondents' responses to one of the items of the questionnaires, which asked participants to describe their experiences of collaborative learning and teaching during the pandemic. Based on the number of terms coded for each participant's response, there is a variation in their response to the questions that probed their experiences of online collaborative teaching and learning during the pandemic.

To be more specific, to find out the participants' online experience a question related to online group interaction and whether the interaction had a positive impact on their learning experience was raised. Seven out of twelve respondents indicated that there was little room for collaborative learning in online classes. In the analysis, the data was coded based on the terms used by the respondents to express their experiences of collaborative learning. Respondents, the majority being the students, who used negative terms appeared most, whereas respondents with positive experiences used positive terms, as shown in the graph (see Figure 4 for more details).

One of the respondents (student – 4) states his experience of remote learning as 'boring'. In response to one of the items in the questionnaires about collaborative learning, he stated *there is no active participation which makes all the students feel bored*.

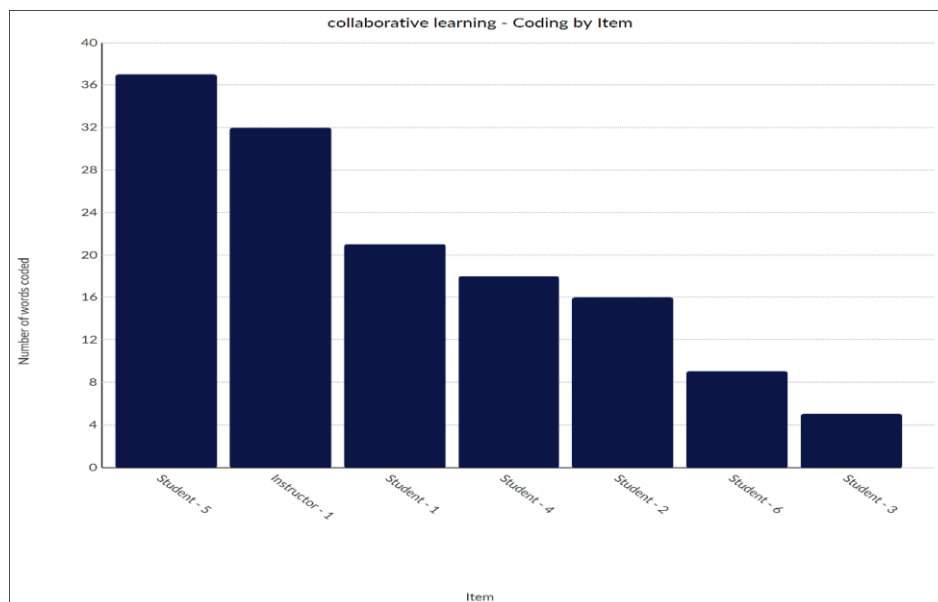


Figure 4: Participants' experience of collaborative learning

He said that *in the absence of interaction with classmates to learn with and from each other, we all gained little or no knowledge from our study from remote learning.* This implies that even when the internet is available for online classes to take place, lack of interaction and discussions with fellow students and instructors had an impact on learning the content of the lesson.

Textual analysis of the participants' responses was captured by the Word Cloud (see Figure 5) indicating the words with bigger fonts as the ones most referred to by the respondents. This visual presentation indicated that gaining *knowledge* through *discussion* and *active learning* was a *challenging* experience for the participants during the emergency remote teaching and learning.

Comparable results were found in a study conducted by Lall and Singh (2020) in which, students favoured remote learning, but they



stick to the traditional teaching method in an online environment (Gray, 2019). A student commented, that *in comparison to face-to-face classes we lost detailed discussion during online lessons*. Another student also commented, that *in a physical classroom, when I have questions I immediately ask and get the answer. In online classes, there is no such interaction*. The participants also revealed that they had to send messages to their teachers or peers and sometimes made direct phone calls to get clarification of difficult concepts. Teachers in the current study also indicated that electronic messaging was the only channel of communication through which they sent out limited learning materials to the students to work on independently.

Furthermore, university students were encouraged to access course materials from the Ministry of Education websites. These materials were designed by their teachers in a PowerPoint presentation format and lecture notes meant to replace classroom instructions (Mikyias, 2020). However, students struggled to make sense of these resources on their own as they were not allowed to engage with their teachers or peers.

According to Behnagh and Yasrebi(2020), educational technology is constructed in line with the principles of constructivist theory of learning, which implies that technology can enhance collaborative learning by engaging learners in an active interaction which leads to meaning construction. In online teaching programmes, using audio and video teachers can maintain human touch with their students and encourage collaborative learning. However, the result of this study reveals a lack of space for interaction between student-student and student-teachers.

### *Students and Teachers' Perception of Their Online Experiences*

All the participants' data related to the question of their perception of remote teaching and learning during the pandemic were imported and

analysed in NVivo. In our findings themes that emerged from participants' coded data illustrated that more than half of the participants had negative perceptions (see figure 6) about their experience of online teaching and learning, whereas only three of the respondents indicated that they had enjoyable experiences despite the challenges of connectivity. It is also clear from the analysis that two of the participants had a mixed (positive and negative) experience.

One of the instructors commented that *the quality of education is decreasing in general and through online learning it is nearing zero*. Responding to one of the questionnaire items about perception and experiences, a university official (Uni official 3) commented:

*The first thing I could say is a lack of motivation and a negative attitude towards technology. There are frequent power cuts and internet interruptions in our university. Another problem from the students' side is that students did not have enough internet access. However, I believe that if our university was committed towards the online platform, we could have done it in a better way.*

The above comments seem to capture the main challenges of remote learning at AAU. According to Maekopo (2017), the blending of technology with teaching and learning in African higher education is gradually growing with the potential to improve the quality of education in the continent. However, contrary to Maekopo's claim, in this study there were identified gaps in promoting e-learning at the time of crisis at AAU.

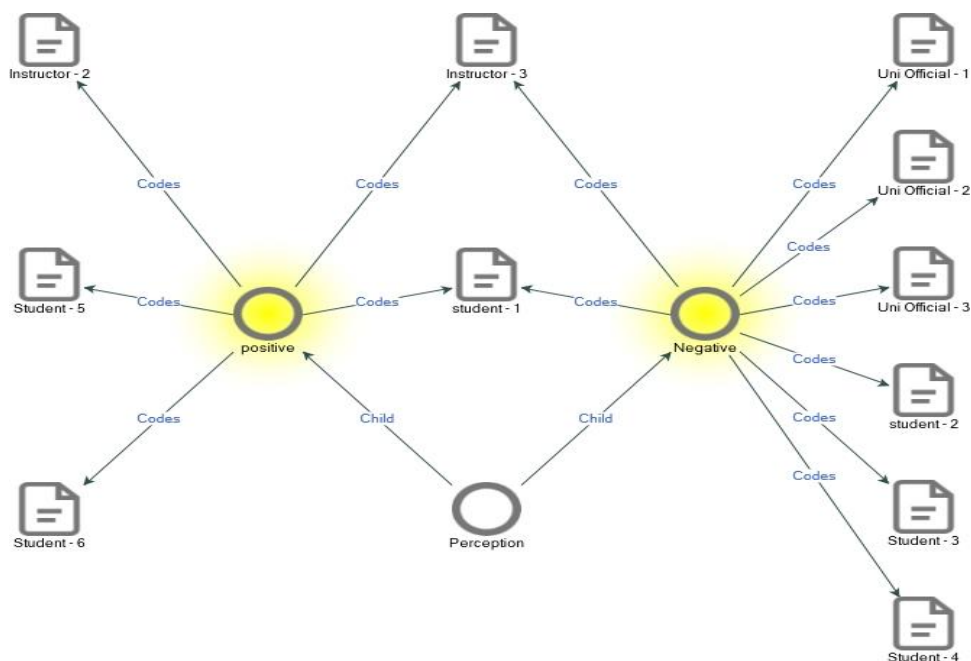


Figure 6. Diagram illustrating respondents' perception of online experience.

The study shows that some respondents, despite the lack of sufficient ICT infrastructure, have shown positivity towards remote learning during the closure of the university. One of the faculty members in the current study commented on opportunities that remote teaching can offer:

*It is challenging only if the students have no internet access. For those who do have it, we enjoyed it. My students also appreciate it. Because it allowed us to record our discussion for later use. The students have all the records of the lectures and discussions we have. In this regard, it is better than the face to face. It also made us perfect in timekeeping.*

This is indicative of the significance of technological resources for bringing success in teaching and learning through online platforms. One of the positive outcomes of the pandemic is that online learning,



which was largely ignored in the context of Ethiopian higher education in the past, is now recognised as a necessity to provide education. All the respondents in the study have highlighted the need to improve infrastructure that supports remote learning and make use of technology to enhance teaching and learning. Reflecting on their experiences, one of the respondents commented that:

*...lesson learnt from the emergency remote teaching is that cancellation of classes can be avoided when teachers are away from campuses and teaching and learning can still be conducted remotely.*

This implies that the flexibility of online mode can help improve learning by engaging learners anytime from anywhere. This finding of online time flexibility supports studies conducted in other contexts (e.g., Lall & Singh, 2020). Student respondents highlighted that having recorded lessons helped them with revision and taking notes in their own time after the lessons. Students' positivity towards online classes, despite the challenges presented by poor infrastructure, could be the result of their familiarity with the advancement of technology. Participants of the study also indicated that the online programme was a good opportunity to develop digital literacy for both teachers and students. Similarly, Witze(2020) indicated that the online education forced by the COVID-19 pandemic had the potential to produce graduates with better digital skills with the opportunity to work in a technology-based industry. Additionally, teachers are likely to improve their online pedagogy and digital skills because of remote teaching during the pandemic.

## **Conclusion**

The purpose of the current study was to explore students' and teachers' experiences of emergency remote teaching and learning at the Social Science College of AAU during the COVID-19 pandemic. The study unveiled a gap between government policy intention and the challenges of providing online classes. The findings showed the

dearth of access to internet connectivity and lack of institutional support as major challenges experienced by students and teachers during remote teaching and learning. The overpriced internet connection combined with a lack of appropriate technological devices and regular power interruptions exacerbated these challenges.

The challenges identified in this study contributed to the already existing disparities in educational access and opportunities, particularly for students from disadvantaged backgrounds. Those with limited or no access to a stable internet connection and suitable devices faced disadvantages in participating fully in online learning activities. To mitigate technological barriers to accessing online education, and increase inclusive participation, the government, together with educational institutions, need to support students from lower socio-economic backgrounds.

The study also highlighted that instructors were not initially prepared for the rapid transition to online teaching. The study revealed the lack of institutional support in terms of providing teachers with trainings to use digital tools to effectively conduct online classes. Looking forward, the study recommended that AAU needs to provide teaching staff with pedagogical training and technical support for effective online delivery that could enhance learners' experiences.

Moreover, the study uncovered that students' engagement with course contents was affected due to the absence of two-way interaction. Compared to face-to-face classes, student-student and teacher-student interaction were adversely affected linked to teachers' lack of experience and digital skills to conduct online classes. To enhance students' experiences through interaction and collaborative learning, the University needs to offer continuous professional development and training programmes for teachers to develop their pedagogical skills in online teaching and collaborative learning.

To sum up, this study has contributed to filling the gap in the literature about online classes in the current research setting. The study has also made a methodological contribution to data management and analysis by employing qualitative data analysis software that helps to increase transparency and minimise research bias in data analysis. Although it is a small-scale study, the results have significant implications for the future of online university education at AAU and beyond.

#### *Limitations of the study*

This is a small case study in which a single data gathering method (qualitative questionnaires) was used to gather data to gain insights into students' and teachers' experiences about remote learning forced by the spread of the COVID-19 pandemic in Ethiopian HEIs. As this study was limited to just one university, it does not attempt to generalise the findings from the data although the results of the study imply wider educational institutions in this context. The researchers of the current study believe that more themes are likely to emerge in future research that employs multiple data-gathering methods with a bigger sample size that represents multiple HEIs in the country.

#### **Declaration of Interest**

No conflict of interest

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