

BINDURA UNIVERSITY OF SCIENCE EDUCATION



RESEARCH PROJECT

***CHALLENGES FACING THE IMPLEMENTATION OF ONLINE TEACHING AND
LEARNING OF ORDINARY LEVEL BIOLOGY IN SCHOOLS IN MAZVIHWA AREA OF
ZVISHAVANE DISTRICT.***

BY

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***A RESEARCH PROJECT SUBMITTED TO FACULTY OF SCIENCE
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REQUIREMENTS OF THE BACHELOR OF SCIENCE EDUCATION HONORS
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EDUCATION.***

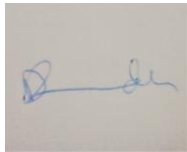
DUE DATE: 30 JUNE, 2024

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DECLARATION FORM

I, Zenda Doreen Pedzisai: B1437866, declare that this is my original work that has not been submitted for any degree or examination in any other university and that all the sources I have used or quoted here have been indicated and acknowledged.

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APPROVAL FORM

The undersigned certify that they have supervised, have read and recommend to the University for acceptance and examination a research project entitled: **Challenges facing the implementation of online teaching and learning of ordinary level biology in schools in Mazvihwa area of Zvishavane district**, submitted by Zenda Doreen Pedzisai (B1437866) in partial fulfilment of the requirements for the award of Bachelor of Science Education in Biology Honors Degree.

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DEDICATION

This research is dedicated to my mother Susan Patricia Zenda who has given me the opportunity of an education from the best institutions and support this far, and to my dearest life partner and loving husband Tinotenda Mhuri who has been there for me throughout this course.

ACKNOWLEDGEMENTS

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ABSTRACT

The research was on challenges facing the implementation of online teaching and learning of ordinary level Biology at two named Secondary schools in Zvishavane District. The project therefore sought to identify challenges that the learners and teachers face in implementing online teaching and learning during the Covid19 pandemic, answering the following research questions; To what extent do Biology teachers use online learning in the teaching and learning of Biology to Ordinary Level learners? What are the benefits of using online learning in the teaching and learning of Biology at Ordinary Level? What challenges hamper the effective teaching and learning of Ordinary Level Biology using online learning? What techniques can be adopted by educators to best make use of online learning in the teaching and learning of Biology at Ordinary Level? On literature review, an evaluation was made on the literature pertaining to: the extent to which online learning is applicable in teaching and learning, the benefits of online learning in facilitating the teaching and learning process, the challenges that can hamper the effective use of online learning in teaching and learning and the possible techniques that can be adopted to improve the use of online learning in the teaching and learning of Biology at Ordinary Level. The sample was made of ten O level Biology learners where the researcher employed a systematic random sampling technique to come up with the sample. The researcher also worked with four Biology teachers in this study. During the study, questionnaires and interviews were used as the research instruments with their merits and demerits being cited briefly. A questionnaire and an interview guide were used on interviewing the Biology teachers and learners. Collected data was presented in form of tables, graphs and charts and then analyzed. After data analysis, answers to the sub problems were given in the research findings. Recommendations were then given, after which a summary was given followed by a conclusion. The data collected indicated that that online learning could appear challenging in the first days of its inception, but after a while, both learners and teachers would acclimatize. The researcher also found out that with adequate support, teachers were ready to

implement online learning teaching and learning. The researcher therefore made the following recommendations; the study should be carried on many schools to enable gathering of data from a remarkable population that can allow for generalization of findings; schools should offer technical assistance to teachers in terms of ICT gadgets and internet bundles to ease the process of virtual learning; the Zimbabwean government should also be on the ground with tangible assistance when recommending the implementation of online lessons, not heaping much of the burden on schools and the parent community. Parents of secondary school learners should be closer to their children to enable monitoring and evaluation during virtual learning. The researcher did not encounter any major challenges in carrying out the study. The study was completed in 2024.

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CHAPTER ONE

THE PROBLEM AND ITS SETTING

1.0. Introduction

The main aim of this chapter is to unpack all circumstances related to the researcher's study area. These encompass: a brief background to the study, statement of the problem, research questions as well as the significance of the study to various stakeholders. Also, to be highlighted in this chapter are limitations that scuttled the finesse of this study, the study delimitations as well the conceptual analysis of key terms.

1.1. Background of the Study

Since time immemorial, the educating and studying of BIOLOGY used to be achieved the usage of standard educating and mastering methods like: the lecture, the story telling, query and answer, and the discovery method, the sensible and observation method (Kasambira, 2017); among others. With the passage of time and technological advances, different teaching and mastering procedures like simulations, video films, laboratory experiments and debates (Tripod, 2010) were incorporated. The new methodologies are basically child-centered, with the fundamental intention being to involve the inexperienced persons as plenty as feasible throughout educating and learning. With the coming of world pandemics like COVID-19, as properly as the emergency of the cholera epidemics in most parts of Zimbabwe, teachers have been challenged to resort to completely specific teaching and mastering methodologies that have a bias closer to distance learning. According to the sentiments of Chick (2020), COVID-19 has brought about several adjustments in ways of educating as endorsed with the aid of WHO protocols of curbing the spread of the pandemic like: social distancing, sanitizing, covering up as well as personal hygiene. The use of the web and ICT tools in teaching and getting to know of BIOLOGY has been practiced considering that independence but the coming of the COVID-19 scourge brought complications to many instructors and calls for acceleration of the use of online teaching and mastering techniques.

Online learning is described via Manning (2019) as an interactive system in two principal divisions; as broadcasted or as interaction between two or greater people. Broadcasted online studying comes in the structure of radio or televised announcements, whilst the interactive on-line mastering offers with verbal exchange between two or greater people, for example on platforms like Facebook,

WhatsApp, Twitter or emails. For each types of ONLINE LEARNING, web connection is a pre-requisite as nicely as possession of an appropriate gadget. For example, it is not possible to get hold of statistics of broadcasted online getting to know when you do not have devices like radios, laptops or clever phones. Similarly, to interact on on-line learning, one needs to have fantastic devices that can get admission to the internet. The use of on-line studying to facilitate the instructing and learning of BIOLOGY is no longer a good deal documented, on the grounds that the subject has been taught the use of conventional teaching and gaining knowledge of methods. A learn about carried via Mikis (2012) on the effectiveness of the use of ICT in instructing and learning indicates that technology brings about several opportunities to facilitate the process. On the different hand, Tripod (2010) submits that there are additionally obtrusive drawbacks that are associated with use of on line mastering as a educating and gaining knowledge of approach in BIOLOGY.

A lot of stakeholders are worried in the instructing and getting to know of BIOLOGY the usage of on line learning. According to the sentiments opined through Giavirimis (2016), the use of ICT-related forms of instructing and getting to know requires a collaborative effort if the opportunities that ICT brings along are to be utilized maximally. Correspondingly, the father or mother community, teachers, rookies and the school administrators play collaborative roles in ensuring that the use of online gaining knowledge of to facilitate instructing and gaining knowledge of materializes. A study carried through Mikis (2020) in Austria-Hungary mounted that the use of on line gaining knowledge of in teaching and studying of BIOLOGY might also lead to dissemination of unverified statistics if not monitored closely. The researcher has mentioned that in creating international locations the place resources are in quick supply, the use of on line studying is progressing sluggishly and the fee of implementing it is not approaching owing to countless issues. In another discovering via Thomas (2020), online getting to know as a form of instructing requires a tactical method in which educators and newbies have interaction meaningfully with the former thoroughly planning the content material to be given to learners. Being a new approach, the researcher believes that a lot is yet to be realized about the relevance of on-line getting to know in the teaching and studying of BIOLOGY, consequently the want to lift out this study.

1.2 Statement of the problem

The onset of the COVID-19 pandemic rattled the education sectors of many countries, compelling the majority of countries to adopt non-contact forms of teaching and learning as envisaged by protocols of the COVID-19 scourge. The developed world, apart from ensuring strict safety measures – sanitizing, masking up, social distancing and personal hygiene – for those learners that went back to classes, introduced virtual learning platforms that saw learners receiving online lessons in the comfort of their homes. In the developing countries like Zimbabwe, the COVID-19 era caught them unaware and consequently saw schools being closed indefinitely and half-backed learners sat for their 2020 and 2021 Ordinary level examinations, notwithstanding. Teachers in different faculties, BIOLOGY included, devised many initiatives to reach out to their learners amidst the lockdowns perpetuated by the prevalence of COVID-19 cases and deaths. Some BIOLOGY teachers adopted online lessons via online learning platforms such as WhatsApp and other learning platforms like Google classroom, but the extent to which these methods reap the intended instructional goals is hampered by numerous shortcomings. It is against this background that the researcher was compelled to investigate the opportunities and challenges of using online learning platforms in the teaching and learning of BIOLOGY at Ordinary Level in four selected secondary schools in Mazvihwa area of Zvishavane District.

1.3 Research Questions

1.3.1 Major Research Question

1.3.1.1 What opportunities and challenges do educators encounter when using online learning in the teaching and learning of BIOLOGY at Ordinary Level?

1.3.2. Sub-Research Questions

1.3.2.2. To what extent do BIOLOGY teachers use online learning in the teaching and learning of BIOLOGY to Ordinary Level learners?

1.3.2.3. What are the benefits of using online learning in the teaching and learning of BIOLOGY at Ordinary Level?

1.3.2.4. What challenges hamper the effective teaching and learning of Ordinary Level BIOLOGY using online learning?

1.3.2.5. What techniques can be adopted by educators to best make use of online learning in the teaching and learning of BIOLOGY at Ordinary Level?

1.4 RESEARCH AIMS AND OBJECTIVES

1.4.1 AIMS

The aim of this study is to explore the challenges facing the implementation of online teaching and learning of ordinary level biology in schools in Mazvihwa area of Zvishavane.

1.4.2 Objectives:

1. To assess the opportunities and challenges educators have in teaching and learning of biology
2. To determine the extent to which biology teachers use online learning in teaching and learning of biology.
3. To suggest benefits of using online learning in teaching and learning of biology.
4. To assess the challenges hampering the effective teaching and learning of biology
5. To suggest techniques that can be adopted by educators in teaching and learning of biology

1.5 Assumptions of the study

The study is premised on the following assumptions

- a) adequate resources at schools to cater for online learning of BIOLOGY
- b) Covid-19 lockdowns have changed the way of educating and learning of BIOLOGY

- c) Teachers lack knowledge of online learning of BIOLOGY
- d) Online learning has benefits in teaching and learning of BIOLOGY
- e) There are techniques that can be adopted by educators to best make use of online learning in teaching and learning of BIOLOGY

1.6 Purpose of the study

The purpose of the study is to explore the challenges facing the implementation of online teaching and learning of ordinary level biology in schools in Mazvihwa area of Zvishavane.

1.7 Delimitations of the Study

This study is will be carried out in Zvishavane District, found in Midlands Province. It will be carried out on 2 secondary schools in the Mazvihwa Zone, namely: Masehuni and Rubweruchena. A total of 12 individuals will be used in this study, amongst them 10 BIOLOGY teachers, males and females. As well as 2 school heads, male and female .The participants will be sampled purposively. The essential cause of carrying out this research is to discover opportunities and challenges going through BIOLOGY teachers in the use of online learning when instructing Ordinary Level learners. The study will be once accomplished in 2024.

1.8. LIMITATION OF THE STUDY

1.8.1 Financial constraints

The researcher would have preferred to elevate out the research in the whole Zvishavane District, or even in many secondary schools in Midlands Province, but financial constraints restricted me to solely two secondary schools in one cluster.

1.8.2. Time constraints

Time constraints play a significant role in determining the chosen methodology and the sample. The researcher would have desired to use face to face statistics collection strategies but due to the prevailing Cholera epidemic, she will adopt to on-line procedures of information collection, which are expensive in nature. To avert economic hitch-ups, the researcher relies on her husband, parents,

friends and relatives. Proper sampling methods additionally will help the researcher to have a discreet sample free shape bias and from which effects of this research about can be generalised.

1.9. Significant of the study

The researcher contends that this research will be substantial to many stakeholders, among them: learners, teachers, college heads and officers at the Curriculum Development and Technical Services (CDTS).

1.9.1. Learners

Learners can advantage a good deal from getting to know through ONLINE LEARNING, as they are not solely going to enhance on the use of Information and Communication Technology (ICT) tools, however they may also additionally discover something to occupy them in the face of lockdowns that can also be brought about via pandemics and epidemics. Learning on line will assist limit deviant behavior related with idleness, e.g. drug abuse.

1.9.2 Teachers

Teachers may locate on-line instructing and learning really helpful for their learners as it will enable them to cowl the BIOLOGY syllabus whilst at home. This will consequently enhance the skip rate in BIOLOGY at Ordinary Level in many schools and the country at large.

1.9.3 School heads

School heads, who are the vendors of an awful lot technical support to teachers and learners, can also additionally realise the magnitude of funding lessons conducted through on line getting to know platforms as the quit end result will gain the school.

1.9.4 Faculty administrators

Through this study, faculty administrators are going to be acquainted with the several roles they ought to play to make the instructing and gaining knowledge of BIOLOGY to Ordinary Level novices successful, among these: provision of ample information bundles, buying ICT devices and presenting remuneration applications for teachers.

1.9.5. Curriculum developers

The curriculum developers may additionally gain from this study, as they shall make use of the tips to be counseled through the researcher to encompass contemporary methodologies (e.g. on-line learning) when designing syllabus for Ordinary Level BIOLOGY.

1.10 DEFINATION OF TERMS

- Challenges – a condition that makes it difficult to perform a particular task. In this study, challenges will refer to hindrances associated with the use of online learning in the teaching and learning of BIOLOGY during Covid-19.
- BIOLOGY– the study of life, particularly plant and animal life.
- Ordinary Level – the level of education in the Zimbabwean education system spanning from form three to form four (Hilderbrand 1990).
- Secondary school – a learning institution in Zimbabwe that enrolls learners from Form 1 to Form 6 level (Hilderbrand 1990).
- Learners – pupils/students attending secondary school
- Teaching and learning – Morrison (1998) defines learning as a permanent change in behaviour which is a result of practice and experience. Therefore teaching and learning is the kind of things teachers do in an effort to help learners acquire particular subject matter.

1.11 THE ORGANISATION OF THE STUDY

The study is divided into five parts that provide an exhaustive understanding of the subjects under debate.

Chapter One: In summary, the chapter starts of by presenting the context within which the study was conducted as the researcher's background. It is then followed by several subheadings such as purpose of the study which explains what the study intends to accomplish for example the statement of the problem which provides why the researcher wants to investigate this problem, and how the research findings may help address the problem. Research objectives show the steps to be followed in the research process. Research questions points out main questions, determine and anticipate the theoretical work of the research. Moving on, there is an assumption of the study which shows what can be assumed during the research. It is followed by significance of the study.

Followed by delimitations of the study which are boundaries of the research, limitations of the study which explain why proposed research is worthwhile and necessary.

Chapter Two: Literature review and theoretical framework. This chapter shows the identification of major literature that supports and validates the topic which was once reviewed by other sources.

Chapter Three: It consist of three parts purpose of the study, research design and methods, in summary purpose of the study and research design, reciprocates the purpose of the study and describe the research design and components used in the study as research design and methodology.

Chapter Four: This chapter is comprised of data presentation, analysis and discussion of findings which points out results and discussion which may also be presented together. The discussion states the implications of the findings and their limitations as well as the conclusions drawn and relates the observations to previously published relevant studies and supported by relevant references.

Chapter Five: This chapter consist of the summary, conclusions, recommendations and areas for further research which assets how the finding in the study was important and relevant to the study aim and focus and comparing the finding to the literature summarizing the whole research and giving recommendations and conclusions.

1.12 Summary

This chapter unveiled the problem and its general setting. This was achieved by: analysing a brief background to the study, explaining the main problem under study, identifying research questions and justifying the need for this study by various stakeholders. Again, the researcher described the research boundaries, outlined study assumptions, explored the limitations that hampered effective carrying out of the study and proposed possible solutions. Finally, the researcher defined key terms used and gave the chapter summary. The next section, Chapter 2, scrutinizes the literature from earlier educationists who contributed their ideas to the field of online learning as a teaching and learning approach.

CHAPTER 2

LITERATURE REVIEW

2.0. Introduction

The basis of Chapter 2 is to analyse contributions made by earlier scholars on the issue of E-learning and its significance in facilitating the teaching and learning of BIOLOGY. An evaluation shall be made on the literature pertaining to: the extent to which E-learning is applicable in teaching and learning, the benefits of E-learning in facilitating the teaching and learning process, the challenges that can hamper the effective use of E-learning in teaching and learning and the possible techniques that can be adopted to improve the use of E-learning in the teaching and learning of BIOLOGY at Ordinary Level.

2.1 Empirical Literature

2.1.1 The Extent to Which E-learning Is Applicable In Teaching and Learning

2.1.1.1 Learning through WhatsApp Groups

E-learning encompasses learning through the use of internet services and social platforms such as WhatsApp groups. A study by Duraku and Hoxha (2020) indicates that due to the emergence of the COVID-19 pandemic, E-learning platforms such as WhatsApp have become common ways through which teachers can reach out their learners. In Zimbabwe, the use of WhatsApp has been mainly for social communication but with the need to adopt E-learning, the WhatsApp facility has now been instrumental for facilitating the teaching and learning process. According to Zanamwe, Rupere and Kufandirimbwa (2013), teachers in Zimbabwe have considered WhatsApp groups as one of the best means to transmit knowledge and skills to their myriad of learners across the country, due to its cheaply nature and easy accessibility even by marginalized communities.

2.1.1.2 Learning via Broadcasted E-learning

Despite the onset of the COVID-19 contagion, the use of broadcasted media in the form of radios and televisions has been prevalent in Zimbabwe for long. According to Lee (2016), the use of televisions and radios to relay educative material to learners has been in practice since time immemorial, although challenges associated with this teaching and learning strategy are rampant, among them: lack of televisions and radios, inconsistent bandwidths as well as difficulties in assessing content learnt via broadcasted media. Similarly, Sengere (2018) contends that in Zimbabwe, state radio stations and state newspapers have been very instrumental tools used by the Ministry of Primary and Secondary Education to occupy learners during lockdowns induced by the deadly COVID-19 plague. Zimuto (2013) submits that, while televised lessons, or those broadcasted via radio are useful for learners, sometimes they are not consistent with the requirements of actual classroom learning

2.1.1.3 Learning through Emails, Facebook, Instagram and other social Platforms

Apart from WhatsApp groups and broadcasted E-learning, trending on Facebook and Instagram, as well as emailing are some of the social platforms used by contemporary teachers to deliver subject matter and get immediate feedback from their multitude learners. The sentiments opined by Matthews (2016) indicate that the Facebook pages formerly meant for social chatting and mass communication have of late been turned into an educational platform through which invaluable educative material can be transmitted. In the same vein, Rehman and Ali (2021) observe in Pakistan that the COVID-19 pandemic has ushered in new methodologies and teachers are using emails, Twitter, WhatsApp and other E-learning applications to send assignments to learners, and get feedback via the same method. Nonetheless, the dear nature of accessing the internet and

procuring gadgets that are internet-friendly is an inhibition factor in other marginalized communities like rural areas.

2.1.2 Merits of Using E-learning in Teaching and Learning

2.1.2.1 Best Approach In The Light of the Covid-19 Pandemic

The use of E-learning platforms to facilitate teaching and learning comes as an opportunity for teachers to lessen the transmission of the lethal COVID-19 pandemic (Mugari, 2020). In the sentiments of Chick (2020), COVID-19 is one such pandemic that has kept learners out of classes and consequently compelling educational institutions to adopt virtual means of teaching and learning. Thus, apart from many other numerous benefits enjoyed through the use of E-learning as a teaching and learning approach, its major contribution lies in the fact that it follows the WHO (2020) protocols envisaged to lessen the spread of the COVID-19 contagion. Through the use of E-learning, there is already social distancing, and there is no need for continued sanitization, masking up and personal cleanliness expected of teachers and learners at a public school. Correspondingly, Rehman and Ali (2021) acknowledge that there is no other way through which the detrimental effects of COVID-19 induced lockdowns could be averted save using virtual learning platforms like E-learning.

2.1.2.2 It Can Be Useful When Dealing With Large Classes

In spite of spiralling enrolments characteristic with Zimbabwean classrooms currently, there is a growing concern of how teachers can cater for each individual learner. In the light of such a scenario, the use of E-learning is heavily recommended. Mustafa (2018) also propounds that through E-learning, teachers can reach out to individual learners and assist them accordingly; accelerating the gifted learners and scaffolding those having challenges to pull through. This

implies that while other forms of E-learning, e.g. radio broadcasts discourage individual attention, other forms of E-learning such as email, twitter, WhatsApp or Facebook encourage face-to-face communication between the teacher and the learner, consequently increasing the chances of acceleration and remediation (Matthews, 2016).

2.1.2.3 It Ensures Uninterrupted Content Delivery

In another assertion by Manning (2019), E-learning can be used to deliver uninterrupted content if appropriately scheduled. The use of emailing as a form of knowledge transmission is construed as ideal since the transmitted data is kept in the cloud. The use of pre-played audios and videos on the television or radio makes it possible for learners to be carried through from the onset of the lesson to the end without undue interruptions. Similarly, Amry (2018) acknowledges that some of the audios sent via virtual platforms like Facebook and WhatsApp can allow any learner to be engaged during their own spare time without any interruptions. However, Yin (2016) condescends that the use of E-learning can be interrupted by external factors such as internet connectivity, electricity availability as well as physical noise if not well planned. Karombo (2017) also observes that in Zimbabwe, the inconsistent availability of electricity and internet connectivity are a cause for concern for teachers and learners who may want to conduct their lessons via E-learning.

2.1.2.4 Can Provide Permanent Records for Future Use

In another interesting and invaluable revelation, Ahmad (2011) avers that most E-learning platforms are backed up by Google Apps and the data so generated is permanently kept. Data sent via web-based emails, Facebook, Instagram and Twitter is backed up in the cloud storage and can be retrieved in the future for easy referencing. This implies that all the data communicated between teachers and learners can easily be filed using cloud computing services, and either party can

retrieve the data in times of need. Moreover, cloud based services do not only serve to safeguard data from intruders, or to make the data available for future references, but it is also an instrumental method of maintaining privacy and confidentiality throughout the teaching and learning process. Cela (2015) claims that the use of E-learning enables high levels of privacy that motivates other learners to do their best.

2.1.2.5 Learners can Progress at their Own Pace.

Depending on the availability of resources, and the extent to which teachers are motivated to be at the convenience of learners, E-learning can allow learners to progress at a pace that suits their ability level. In the developed world, Ali (2016) opines that learners and their teachers have the liberty to use E-learning to interact at personal level, resultantly allowing the former to dictate the pace at which the teaching and learning process should adopt. In another similar revelation by Kimutai (2019), Education authorities in India have supplemented televised teaching and learning with E-learning instruction to enable one-on-one tuition as well as any clarifications that learners may require from the teacher. Thus, after a televised or radio broadcast, Wright and Webb (2011) maintain that teachers or presenters leave their contact details so that those with assignments as well as those requiring remediation can easily get assistance.

2.1.2.6 Improves Teachers' and Learners' Communication and Interactive Skills

For effective learning to take place, Faizi, Afia and Chiheb (2013) concurs that there should be an interactive process between educators and their learners and E-learning is one of the ways to promote that interactive process. This implies that through E-learning, teachers and learners can engage in meaningful discussions that promote critical thinking, problem solving and effective acquisition of requisite skills. In the same line of opinion, Boateng and Amankwaa (2019) aver

that the interactive opportunities accorded to learners and teachers culminate into acquisition of effective communication skills. E-learning encourages both pupil-pupil and teacher-pupil interaction which in the end consolidates skills being learnt. Bakker and De Vreese (2011) also posit that the pupil-pupil and teacher-pupil interaction exhibited during E-learning interaction is a vehicle for effective communication on both teachers and learners.

2.1.3 CHALLENGES OF USING E-LEARNING IN TEACHING AND LEARNING

2.1.3.1 It is an Expensive Method

Despite its numerous merits, E-learning as a form of teaching and learning is very expensive considering the nature of resources required by those who intend to rope it in teaching and learning. According to Gurcan (2015), E-learning as a method of teaching and learning is like any other form of virtual learning that calls for additional resources to make it a viable approach. A study carried out by Lila (2019) indicates that the Albanian government is finding it an uphill battle to implement virtual learning platforms such as E-learning due to the additional demands in resources required by the method. The additional resources required in the effective use of E-learning as a teaching and learning method include: internet connectivity, ICT gadgets consistent with the internet, electricity, infrastructure as well as personnel to implement the teaching and learning process.

2.1.3.2 It Heavily Relies on Internet Connectivity

The use of the internet during E-learning communication should not be underestimated when teachers and learners intend to reap positive results. A study carried in Zimbabwe by Museka and Taringa (2019) and Karombo (2017) indicated that some of the marginalized communities in rural areas could not make use of E-LEARNING methods of teaching and learning owing to poor

internet connectivity. Almost the entirety of all E-learning platforms relies on internet bandwidths, which have to be strong if E-learning communication can materialize. For example, if lessons are broadcasted via television and national radio, the failure at any moment for learners to access internet bandwidths may result in loss of learning time as it is difficult to retrieve a lost lesson. Another study by Tsvere, Swammy and Nyaruwata (2013) in Zimbabwe's revealed that it was indeed an uphill battle for people in the area to access proper internet connectivity.

2.1.3.3 It Can Promote Acquisition of Unscrupulous Behaviour

In another dimension, the nature of both pupil-pupil and teacher-pupil interaction characteristic with E-learning may also be abused by all the parties involved, consequently leading to unwanted behaviour. In a study by Selwyn (2012), E-learning can be a conduit through which learners may form dangerous relationships that can lead to unwanted behaviour. Since E-learning encompasses use of smart phones and other ICT itinerary, there are vast opportunities that the use of the E-learning may encourage learners to meet and interact with people of varied intentions, endangering them consequentially. In the Zimbabwean context, Ncube, Dhlamini and Muchemwa (2015) observe that cases of 'improper association' are on the rise due to the increase in technological gadgets and the unlimited interaction they regularly carry out on E-learning. Again, continuous exposure to E-learning platforms has also exposed learners to unwanted materials in the form of pornography and violent movies, which the learners inappropriately apply in their daily lives.

2.1.3.4 It May not Suit all Types of Learners

In another observation by an educationist based in South Africa, the onset of COVID-19 has forced education systems across the globe to adopt E-LEARNING ways of teaching and learning but most of them have not managed to address individual differences (Briwash, 2011; El-Badawy and

Hashem, 2015). The use of televised or radio broadcasts serves to occupy all learners in a particular education level and give them something to do, but this method does not look at previously acquired skills, the learners' ability levels as well as the nature of help these learners may get in their homes. Baruah (2012) also argues that while lessons broadcasted via television or radio may be useful in other instances but its major drawback is that it overlooks other considerations like: available of these gadgets in the home, learners' maturity level as well as the availability of personnel to help learners at home.

2.1.3.5 It is Difficult to Carry out Effective Assessment E-LEARNING

Another challenge that comes along with teaching and learning via E-learning is the nature of assessment that can be carried out when E-learning is being used as a teaching and learning method. According to the sentiments opined by Faizi et al. (2013), the use of televised or broadcasted ways of teaching and learning make it difficult for learners to get appropriate assessment. Although the presenters may issue tasks to be attempted tasks, it will still resound a daunting task for the learners to be adequately assessed. Similarly, Lee (2016) postulates that the much hyped nationally broadcasted lessons have faced a major challenge that learners are not properly given feedback and some of the learners do engage in cheating escapades just to assert providers of ICT itinerary. Yin (2016) recommends that parents of guardians be directly involved in the monitoring and supervision of the learners lest the latter may mislead the former in terms of what is reaped from E-learning platforms.

2.1.3.6 E-learning requires Consistent Electricity Supply

The state of electricity availability in Zimbabwe is also a cause for concern in the government's initiative to roll out E-learning programs via television, radios, smart phones or even computers.

According to the sentiments of Zanamwe et al. (2013), most gadgets that are used during E-learning interaction heavily rely on the use of electrical power. This follows that for the majority of learners dotted around un-electrified communities, coupled with the inconsistent availability of electricity in Zimbabwe, the use of E-learning as a learning platform may be susceptible to numerous interruptions. In a similar assessment of the Zimbabwean situation, Tunjera, Mukabeta, Ramirez and Zinyeka (2019) also submit that infrastructure for electricity in Zimbabwe is dilapidated such that during the rainy season some areas may go for weeks without electricity. This implies that where televised lessons are offered, lack of electricity may hamper progress.

2.1.3.7 Lack of Technical Expertise on the Part of Teachers and Learners

The teachers and learners at the midst of implementing E-learning as a teaching and learning approach also lack the technical expertise expected of them to fully implement the process. Chiridza, Yorodani, Sigauke and Katsaruware (2016) submit that the Zimbabwean situation is pathetic in terms of implementing any form of computer-based instruction due to limited technical know-how on the part of both classroom practitioners and learners. Supporting the same sentiments is Tsvere et al. (2013), who insists that most Zimbabweans are used to using E-learning as a form of social chatting not as a teaching and learning method. This means that there is need for orientation regarding the use of E-learning as a teaching and learning method, especially in areas like BIOLOGY where hand-outs with assignments questions can be sent via WhatsApp. The onset of the COVID-19 pandemic did not accord adequate time for teachers and learners to be adequately acquainted with the use of E-learning to facilitate teaching and learning.

2.1.3.8 Heavily Relies On Availability of ICT Gadgets

In another vital observation, Mustafa (2018) maintains that the use of E-learning as a teaching and learning platform has shortcomings such as the unavailability of adequate ICT gadgets in many households. Although Zimbabwe has come of age in terms of radio, smart phones and television ownership, many households still reel under the agony of ICT shortages to facilitate effective teaching and learning. This claim echoes the sentiments opined by Sengere (2018), who construes E-LEARNING teaching and learning approaches such as E-learning to be very discriminatory as they cannot reach every home with ease. Were it not for the COVID-19 pandemic which calls for social distancing, the Zimbabwean government could have used facilities like community halls to offer radio or television lesson so as to reach all the marginalized communities that may not access ICT gadgets.

2.1.4 FACTORS TO BE CONSIDERED WHEN USING E-LEARNING TO FACILITATE THE TEACHING AND LEARNING OF BIOLOGY

2.1.4.1 Schools Should Offer Technical Support

The ideas propounded by Ncube et al. (2015) indicate that without technical assistance from the schools and even the government, the use of E-learning platforms to facilitate the teaching and learning process will not be of any value. The majority of schools are heavily incapacitated to fund teaching and learning via E-learning platforms. Teachers require gadgets such as smart phones and laptops for them to be able to implement teaching and learning via virtual approaches. According to Zimuto (2013), the late President of Zimbabwe, and other notable politicians donated computer accessories in many primary and secondary schools as a way to promote computer-aided instruction. However, the majority of the schools had no electrical power and internet connectivity, and the donated ICTs were vandalized without realization of the intended goals. Education

authorities in schools should not wait for teachers to fund themselves in terms of using E-learning platforms to facilitate teaching and learning.

2.1.4.2 Close Monitoring is Required by Parents to Avoid Abuse of E-learning

Another recommendation by one of the most influential educationists, Chiridza et al. (2016) is that there should be close monitoring of learners when E-learning is to be used as a teaching and learning approach since the majority of the learners may abuse the facility. This implies that since E-learning has been well known for transmission of social information, the lack of monitoring by parents of teachers may make it liable to abuse by learners, and as a consequence the desired objectives will not be attained. E-learning platforms like WhatsApp and Facebook are awash with entertainment material and the learners may be carried off and forget the main aim of E-learning as a way to facilitate teaching and learning of Biology. Nonetheless, the researcher holds that Ordinary level learners are mature enough to be responsible when using E-learning platforms for the benefit of teaching and learning of Biology. Due to E-learning interaction, Tarisayi and Manhibi (2017) also assert that cases of ‘improper association’ between teachers and learners are on the rise owing to the unbridled freedom accorded to the latter. Thus, without proper supervision and monitoring, the use of E-learning to facilitate teaching and learning may bring more harm than good to both teachers and learners.

2.1.4.3 Teachers Should Improvise in Case of Shortages

As it has been established that the use of E-learning platforms to facilitate the teaching and learning of BIOLOGY is expensive due to the nature of ICT gadgets required, teachers should not hold schools to ransom by demanding facilities beyond the reach of schools. In a study by Sengere (2018), teachers were urged to fork out resources from their own pockets for the sake of assisting

learners. This means that there is need for teachers to use even personal resources to reach out learners so as to help struggling schools. The researcher sadly notes that some teachers in Zimbabwean secondary schools regarded the challenges posed by COVID-19 as a way to force schools to buy them ICT gadgets to use in teaching and learning. The use of social platforms is not yet documented, and teachers have to devise viable ways through which they can make the process applicable and acceptable in teaching and learning.

2.1.4.4 Teachers Should Have In-service Workshops on Use of E-learning as a Teaching and Learning Method

The use of E-learning to facilitate the teaching and learning of subjects in the secondary school curriculum such as Biology did not beckon that it was coming, and as a result, the majority of educators were caught unaware as to how to implement the teaching method (Bakir and McStay, 2018) The emergent coming of COVID-19 to destabilize the education system in Zimbabwe was ill-timed and the government did not have adequate time to prepare educators on how they could adopt E-learning platforms to replace traditional forms of teaching and learning of Biology. As a result, Eldridge (2016) vows that, schools were supposed to gather around and find the most resourceful personnel to orientate teachers and learners on the best techniques to employ when hoping to use E-learning teaching and learning mechanisms like E-learning. This would have enabled smooth implementation taking cognizant of likely challenges.

2.1.4.5 Common ICT infrastructure is recommended for all Schools

Most consulted authorities seem to pinpoint that the school should be at the centre of all responsibilities in a bid to improve the use of E-learning in teaching and learning. In another

recommendation proposed by Gon and Rawekar (2017), the school which intend to implement computer based teaching and learning should erect common infrastructure to enable all the teachers to work from a common venue. The common infrastructure entails that teachers will be able to operate from a central point and this would reduce costs of procuring gadgets for individual teachers. Nonetheless, Chick (2020) hints that the use of common infrastructure such as desktops, tables and chairs during the COVID-19 contagion is risky, as this makes teachers prone to the deadly pandemic. This implies that schools will now follow a schedule of E-learning lessons with ease as all teachers will be gathered at a central point to deliver their lessons one after the other. This also gives breathing space to the learners who may need to partake of rest periods amidst teaching and learning sessions.

2.2 SUMMARY

This chapter analysed varied literature pertaining to the feasibility of using E-learning to facilitate the teaching and learning process. The researcher examined: the extent to which E-learning can be roped in to facilitate teaching and learning, the benefits of using E-learning to facilitate the teaching and learning process as well as the challenges that may scupper the effective use of E-learning platforms to facilitate the teaching and learning of Biology. Above all, the researcher scrutinized factors that should be taken cognizant of if educators are to effectively implement E-learning as a strategy to enhance teaching and learning of Ordinary Level Biology. The next section, Chapter 3, discusses the research methodologies adopted by the researcher to gather, present and interpret the data from this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter looked at the methods adopted by the researcher to gather data for this study. This included the research design, the target population, the sample, as well as the sampling procedure. The researcher also highlighted research instruments that were used to gather data, as well as the strengths and weaknesses of each of the instrument preferred. The chapter also discussed ethical issues as well as the means through which data for this study were collected, presented, and interpreted to answer research questions.

3.2 RESEARCH DESIGN

The researcher used the normative survey method, commonly called the descriptive survey approach (Leedy, 2019). This research design is easy to construct, and involves the use of questionnaires, interviews and observations to collect data for this study (Punch, 2019). The researcher used the triangulation method, in which three research tools were used to collect data. According to Shumbayawonda (2016), a descriptive survey is a research method used to obtain information which can be analyzed, with patterns extracted and comparisons made. In descriptive surveys, participants respond to questions through interviews and questionnaires and the researcher describes the responses through tables, charts and graphs. Harrison (2013) refers to research design as a cheap method of getting perceptions, attitudes, personal experiences and opinions about a product, people and situations. The descriptive survey also gave the researcher a chance to investigate the opportunities and challenges associated with the use of E-learning in the teaching and learning of Biology at Ordinary Level, with particular reference to four secondary schools in Zvishavane District.

3.3 POPULATION

A population is the total number of units from which data can be collected. According to Burns and Groove (2003:213), a population encompasses “all the elements that meet the criteria for inclusion in a study.” A population can also be defined as a group of individuals or items which share one or more characteristics, and from which data can be collected and presented for analysis. The researcher worked with teachers and Ordinary Level learners found in four selected secondary schools in Mazvihwa Zone, Zvishavane District. Zvishavane District has 26 secondary schools, but due to time and monetary imbalances, the researcher targeted teachers and learners from five schools found in one cluster. The secondary schools are: Zeruvi, Chivizina, Masehuni and Rubweruchena. Thus, the population for this study involved Ordinary Level Biology teachers and learners selected from four secondary schools in Mazvihwa Zone of Zvishavane District. Due to the size of this population, the researcher decided to work on a small sample as detailed below.

3.4 SAMPLE AND SAMPLING PROCEDURE

Sampling is a process of selecting a group of people, events, or behavior with which to conduct a study. Polit (2021:239) defines a sample as “a proportion of the population.” Thus, a sample should be a subset of the entire population. According to O’Leary (2019), sampling is a systematic process, often strategic and mathematical, which involves using the most practical procedures possible for gathering a sample that can best represent a larger population. The researcher worked with a total of 44 participants, among them 30 learners, 10 teachers and 4 school Heads. The researcher used purposive – selecting a sample basing on a certain characteristic - and random sampling – free and irregular selection - to come out with the require sample. Random sampling was preferred by the researcher as all the participants stand an equal chance of being selected for the study without much bias (Leedy, 2019).

3.5 RESEARCH INSTRUMENTS

The researcher made use of questionnaires, oral interviews and direct observations. Each of the instruments used shall be examined below.

3.5.1 Observations

Sweetman et al. (2010) define an observation as a systematic data collection approach, in which researchers use multiple senses to examine respondents in natural settings.

3.5.1.1 Advantages of Observations

- They provide direct access to the participants being studied (Teddie & Tashakkori, 2019). Whether participatory or non-participatory, this implies that the researcher has the chance to directly interact with the participants rather than relying on responses on questionnaires answered by respondents may never see.
- They enable use of multiple senses to collect data (Creswell, 2013). This implies that the researcher can complement some of the observable data with many senses, rather than relying on asking respondents out of sight.
- They are cost effective since they are done on a local scale (Popper, 2019). This means that since the population to be observed is accessed locally and there is no need of issuing copies of observation guides to each participant, costs are saved tremendously. Moreover, there is limited stationery required to record participants, a situation that cuts costs.
- Sweetman et al. (2015) also posit that observations can enable collection of data that can be kept for future use. This implies that data gathered through observations can be filed and used in prospective research work.

3.5.1.2 Disadvantages of Observations

- They are time consuming (Sweetman et al., 2015). This entails that when the population is very big they may tend to be unreliable tools of data gathering as attention may not be equally distributed on the observees. In some instances, Popper (2004) notes that the researcher may end up mixing information of those being observed.
- They are susceptible to observer bias (Creswell, 2013). This results when the researcher fails to record exactly the attributes exhibited by the participant due to many factors. For example, due to the fact that the researcher will be recording and observing at the same time, there is a high likelihood that he/she may miss some of the data required. Similarly, Salmons (2016) acclaims that sometimes, researchers end up writing data where it does not fit due the transient nature of observed facts.
- They are prone to observer effects (Leedy, 2019). The presence of the researcher, especially with non-participatory observations may force the observees to hide some of their behaviours. Thus, the researcher may end up doing observations on participants who are no longer willing to exhibit their actual behaviours.

To mitigate the above shortcomings, the researcher had rapport with the participants before doing the observations to eradicate uneasiness. In addition, the researcher observed the participants' actions on WhatsApp groups so as to avoid mixing up data for the observees. The researcher also prepared an observation schedule that had no complex items to be observed, and he worked with a small population to save time as well as costs.

3.5.2 Oral Interviews

Creswell (2013) defines an interview as a process in which data collection is done through direct verbal interaction between two individuals. The author above contends that interviews are suitable when one intends to solicit for sensitive information.

3.5.2.1 Advantages of Oral Interviews

- They can be conducted with illiterate respondents (Leedy, 2019). Where participants are too young to possess reading and writing skills, the interview method can be used to gather data. Similarly, the use of oral interviews can be used with participants who can generally not read or write, for example, the aged or the visually impaired.
- Their wording and questioning can be modified to suit the level of respondents (Creswell, 2013). This applies to those respondents that have linguistic competency in the language being used by the researcher. Where questions appear vague or double-barrelled, the researcher may reword them to aid comprehension by the interviewee.
- Enables collection of sensitive information (Creswell, 2013). This means that the researcher may confide with the interviewee, consequently enabling the latter to divulge any form of information sought by the researcher.
- Reduces chances of falsifying data (Popper, 2019). Attributes like sex, age or race can be easily noticeable on the respondents, making it impossible for them to falsify this information.
- Enable probing where unclear or vague responses have been given by respondents (Sweetman et al., 2015). Unlike questionnaires, oral interviews enable the researcher to probe further where participants offer unclear responses which need further clarification.

3.5.2.2 Disadvantages of Oral Interviews

- They are time consuming for larger populations (Creswell, 2013). This implies that where respondents are a very large group, the researcher may also require a lot of time to interview each and every respondent.
- They do not provide for anonymity (Popper, 2019). Since they are done face to face, this implies that oral interviews provide no room for anonymity. Sometimes, the respondents may fail to divulge what they actually know due to fear that the information can be leaked out.
- They may render participants uneasy (Leedy, 2019). Just like job interviews, there is a general tendency that interviewees feel unsettled during the interview process. This uneasiness may compel the interviewees to conceal the required evidence and give unreliable information which may not be useful to answer the research questions.

The researcher worked with a reasonably smaller population in this study to minimize time shortages. Moreover, the researcher first assured respondents that this study was purely educational, and this gave them maximum freedom to pour out their hearts to the researcher. Above all, the researcher used a monkey survey that pre-tested his instruments before unveiling them to respondents to ensure that ambiguity and double-barreled questioning was eradicated completely.

3.5.3 Questionnaires

Creswell (2013) defines a questionnaire as a document containing questions designed to solicit information appropriate for data analysis. Popper (2019) also objectifies that questionnaires contain questions related to the research's sub-problems, and are mainly purported to collect information that is useful in satisfying research objectives.

3.5.3.1 Advantages of Questionnaires

- They are familiar with respondents (Creswell, 2013). This entails that the majority of respondents are acquainted with questionnaires and how they are filled in. Popper (2004) adds that they are easy to both construct and respond to. Thus, data collection through questionnaires can be done easily, and without much hassle.
- They can be most appropriate when soliciting for sensitive information (Salmons, 2016). Where respondents may be reluctant to divulge personal secrets which may not suit oral interviews, focus group discussions, or observations, questionnaires can be the most suitable research tools.
- They enable the researcher to collect data very quickly (Creswell, 2013). Questionnaires can be given to a large group of respondents and within a short period of time, the required data can be gathered. Moreover, questionnaires enable the researcher to collect data from respondents who may be far away through posting or mailing (Leedey, 2019)
- They reduce bias and maintain uniformity in data collection (Salmons, 2016). This means that with questionnaires, all respondents are eye-blinkered, and they are directed towards giving responses to uniform items, which make data amenable for analysis. Moreover, their construction and administration is bias free, consequently according all respondents an equal responding environment (Sweetman et al., 2015).

3.5.3.2 Disadvantages of Questionnaires

- They are unsuitable when respondents are illiterate (Leedy, 2019). Where the participants cannot read or write, then the use of questionnaires is unsuitable. This implies that they are discriminatory research tools, as they exclude illiterate respondents. In this study all respondents were able to read and write.

- They do not allow for probing respondents in case of ambiguity (Sweetman et al., 2015). Where incidences of ambiguous questions arise, questionnaires do not allow researchers to further probe for clarification. (Popper (2019) also agrees that sometimes respondents may offer interesting responses requiring further elaboration, and this is unattainable with questionnaires.
- They are costly in terms of typing and printing (Salmons, 2016). The fact that each respondent requires his/her questionnaire means that there are costs to be incurred in typing and printing them. The costs are inflated when the researcher is dealing with numerous respondents.

To minimize the above shortcomings, the researcher pre-tested her questionnaire to ascertain and get rid of the presence of ambiguous items. Further to that, the researcher personally typed the questionnaires to reduce typing costs. The respondents issued with questionnaires were all teachers, thereby guarding against illiteracy.

3.6 Ethical Considerations

Ethical considerations are one of the critical issues to be addressed when carrying out research. Ethics can be viewed as moral principles and standards that govern a person's behaviour in conducting a research (Punch, 2019). The researcher ensured that respondents fully understand the nature of the study, the risks and benefits, so that they make informed decisions on whether to participate or not. Confidentiality was also assured so that questions were answered freely without any fear of victimization (Brundrett & Rhodes, 2013). Basically, the researcher assured participants of their rights to privacy, right to anonymity, right to fairness and right to informed consent. The researcher also obtained permission from University authorities, Provincial

Education Director, District Schools Inspector as well as school heads to carry out this study in the sampled schools.

3.7 DATA COLLECTION, PRESENTATION AND INTERPRETATION PLANS

The researcher used triangulation to collect data for this study. This implies that he made use of three research tools to gather data, namely: questionnaires, oral interviews, as well as direct observations (Punch, 2019). Questionnaires were given to teachers, while interviews were conducted with learners. Above all, the researcher used observations and recorded useful data for analysis. The gathered data was displayed on statistical graphs such as: pie charts, bar graphs, tally tables as well as frequency distribution tables. Thereafter, the data was analyzed and interpreted with reference to research questions or research objectives. This means the researcher found correlations between the gathered data and findings from earlier scholars.

3.8 SUMMARY

This chapter examined the methods and techniques that were used by the researcher to gather data for this study. The researcher used the descriptive survey research design in which questionnaires, oral interviews and participatory observations were used to collect data for the study. The chapter discussed the merits and demerits of the research design and research tools used, and techniques adopted to lessen the challenges they pose. The study's population, sample, sampling procedures, as well as ethical issues prioritized were also analyzed in this chapter. The next section, Chapter 4, presents analyses and interprets the researcher's collected data.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

The focus of this chapter is to present, analyze and interpret the data obtained by the researcher using mixed-method approaches. The data was obtained from questionnaires, interviews and direct observations. These data were collected on the topic: Challenges facing the implementation of online teaching and learning of ordinary level biology in schools in Mazvihwa area of Zvishavane

district. The data obtained sought to answer the following questions; To what extent do biology teachers use online learning in teaching ordinary level biology? What are the benefits of using online learning in teaching biology at ordinary level? What challenges hamper the effective teaching and learning of ordinary level biology? What techniques can be adapted by educators to make use of online learning in teaching and learning of ordinary level biology? The researcher will use tables to present the data collected. The following is the biographical data obtained from questionnaires for teachers.

4.2 Response Rate

Table 4.1 Questionnaire Response RateLP;

Respondent	Sex	Age	Professional qualifications	Working experience
1	F	Below 30	Diploma in education	Between 5 and 10 years
2	F	Between 30 and 40 years	Degreed with secondary education	Between 10 and 15 years
3	F	Between 30 and 40 years	Degreed with secondary education	Between 10 and 15 years

4	M	Between 40 and 50	Diploma in education	Between 5 and 10 years
5	M	Above 50 years	Certificate in education	Above 15 years
6	M	Between 40 and 50 years	Diploma in education	Between 10 and 15 years

The data shown on Table 4.1 indicates that there was a 100% response rate, implying that all the teachers who were given the questionnaires completed and returned them. The researcher attributes the high response rate to the nature of jobs of the teacher respondents, who have to be always at their schools. Again the researcher noted that self-administering questionnaires was an effective approach in enhancing high response rates. Creswell (2014) advises researchers to self-administer questionnaires so as to reduce burden of submission on the respondents. Moreover, the teachers recorded a 100% response rate since they were assured that the study would come with benefits for participants. Among the respondents, three were females while three were males, including two female school heads. One teacher was below 30 years of age, two were aged between 30 and 40 years, two aged between 40 and 50 years and one aged above 50 years. The data also show that the teachers had varying teaching experience, two had an experience of less than 10 years, three had experience of between 10 and 15 years while one had experience above 15 years. The data also showed that one teacher had certificate in education, three hold diplomas and two are degree holders. This shows that the teachers are properly qualified.

4.3 Respondents' Perceptions on the extent to which online learning platforms are applicable in teaching and learning.

The teacher respondents strongly agreed that WhatsApp audios (4) and radio broadcasts (3) were the commonly used forms of teaching and learning online learning platforms. While 2 of the participants disagreed that learners can receive learning material through WhatsApp audios and radio broadcasts, the above data implies that the majority of teachers are of the opinion that it is very possible for learners to get into learning through the use of WhatsApp groups and listening to lessons presented via the radio. These sentiments reflect the findings of Duraku and Hoxha (2020) and Chick (2020), who respectively indicated that WhatsApp groups and radio broadcasts are now the most recommended teaching and learning online learning platforms in teaching and learning of Biology at Ordinary level. However, these sentiments oppose Zanamwe et al. (2013), who observe that while teachers strongly agreed to the use of WhatsApp and radio broadcasts, they were not accessible to many due to the expensive nature of gadgets required.

In addition, the teacher respondents disagreed that television broadcasts were essential in delivering lessons (70%), while other teachers also strongly disagreed that learners could access learning materials via newspapers (80%) and through the use of online sources like Twitter handles, Facebook or You-Tube (90%). This data indicates that the teachers felt that television broadcasts were not feasible for use in the Zimbabwean scenario, as their use was affected by many external factors. These findings are akin to the ideas of Rehman and Ali (2021) who acknowledge that it was an uphill battle for developing countries like Zimbabwe to adopt use of televised learning as their countries have challenges with electricity availability, bandwidth connectivity as well as limited resources. These results imply that although other developed countries were benefitting tremendously from televised online learning to facilitate learning; this was not directly feasible for the Zimbabwean situation.

In the same vein, the sentiments by the teachers that it was not possible for secondary school learners to use online learning platforms and newspapers consolidate the assertions of Chick (2020), who claims that virtual learning and use of newspaper articles were not effective teaching and learning techniques in marginalized communities devoid of gadgets, internet connectivity and a supportive environment. This implies that, teachers underscored the importance of virtual learning via online learning platforms, but they deemed them inappropriate in the context of rural and underdeveloped communities like those found in Zimbabwe. Nonetheless, 10% of the teachers agreed that newspapers and online methods could be used to send teaching and learning materials to learners, indicating that it is a matter of resource availability. Rehman and Ali (2021) and Mugari (2020) all acknowledge that newspapers can be used for teaching and learning of Biology, but not as consistent as required in the era of the COVID-19 pandemic where learners can spend two months outside of the classroom due to COVID-19-induced lockdowns.

The researcher was able to observe the extent to which online learning was used in teaching and learning of Biology at Ordinary level, especially the level of participation of teachers on online learning platforms and noticed that teachers were eager to help learners. Over 70% of the teachers were actively involved in the WhatsApp groups created to help learners with various aspects of acquiring content in Ordinary level Biology. This observation showed that teachers were really ready to help learners, especially on WhatsApp groups. The researcher could not ascertain the source of motivation for teachers' participation on WhatsApp forums, but suspected that teachers were also eager to benefit from each other's input as well as the need to ascertain the extent to which learners read in advance on some given work. The results obtained are not supportive of the propositions of Zanamwe et al. (2013), who feels that teachers are not comfortable with learning via online learning such that they may not participate with confidence.

The results obtained from the interviews indicated that teachers had mixed feelings regarding the extent to which online learning can be a tool to facilitate the teaching and learning of Biology at Ordinary Level. Some of the teachers were of the opinion that online platforms should be used for social interaction and not an instrument to aid teaching and learning since it had numerous complications. Of the teachers, 3 indicated that they were eager to use online learning in teaching and learning but schools had no mechanisms put in place to support the cause. The Teachers indicated that they expected the schools to play a pivotal role in providing support to enable them to adopt online methods of learning. These sentiments resemble what Lila (2014) opines when he insists that there are many hindrances that make individuals negatively perceive use of online learning in teaching and learning.

4.4 Respondents' Perceptions on Merits of Online learning in Teaching and Learning of Ordinary Level Biology

The teacher wanted to know the benefits of using online learning in the teaching and learning of ordinary level biology. From the questionnaires, as regards the merits they can derive from the use of online learning in the teaching and learning of Biology at Ordinary level, 4 of the teachers agreed that online learning is one of the best teaching and learning approaches that can be used amidst the COVID-19 scourge, and another 4 strongly agreed that online learning develops very strong communication and interactive skills in learners. This evidence indicates that the teachers are aware that online learning is one of the best approaches to bring back learners to the classroom situation without contracting the dreadful COVID-19 pandemic. Being an online approach, Chick (2020) submits that online learning platforms stand to be one of the most applicable approaches to assist learners in teaching and learning in times of pandemics like the COVID-19. Similarly, Amakwa and Boateng (2019) supports the sentiments opined by the teachers that online learning

develops communication and interactive skills as he submits that online learning is an important tool to inculcate communication and interactive skills.

Moreover, teachers agreed that online learning can be used to allow learners to go through teaching and learning material at their own pace and it allows teachers to work with over-enrolled classes. This implies a good number of teachers were of the opinion that with online learning platforms, it is possible to attend to learners' individual differences and the learners can resultantly progress with learning at their own pace. This sentiments are a direct resemblance to the ideas posited by Ali (2016), who avers that online learning is a techniques that teachers can use to communicate personally with either fast or slow learners in a bit to help them accordingly. Likewise, Kimutai (2014) upholds that online learning can help teachers to accelerate the gifted learners and scaffold those having problems. In the same line of opinion, Mustafa (2018) postulates that online learning is not feasible in a situation where classes are overcrowded, entailing that teachers will not be able to attend to individual differences when teachers are working with large groups.

However, there was another group of teachers who disagreed that online learning teaching and learning platforms were useful to ensure uninterrupted content supply 4 of 6 and that online learning enables users of the approach to keep records for future use in similar teaching and learning episodes1 of 6. These sentiments imply that the teachers do not view learning via online learning is instrumental in ensuring uninterrupted content supply, as its use is affected by and characteristic with external influences. These sentiments are however in direct contrast with the views postulated by Karombo (2017), who indicates that in the developed nation where economic activities operate normally; there are no fears of electricity and internet challenges that may hamper the effective use of online learning platforms to facilitate teaching and learning. These sentiments imply that availability of electricity and internet bandwidths in developing nations are a great

benefit as witnessed by inconsistency in power cuts. Tunjera et al. (2014) did not object to the notion of power cuts, but further argues that developing nations do not face such problems due to stable economies.

From interviews, the Teachers, in spite of them proclaiming that they do not have access to ICTs that promote the use of online learning to facilitate learning, indicated that they were aware of the listless merits derived from using online learning platforms for teaching and learning. Seventy percent (70%) of the Teachers hinted that online learning was indispensable in teaching and learning of Biology as they acted as it: improved their interactive skills, allowed them to work at their own pace in the comfort of their homes and perfectly suited this era of the COVID-19 pandemic. This finding is consistent with the assertions of Rehman and Ali (2021) who advocates for use of online learning in teaching and learning, claiming that it falls within the WHO envisaged protocols of preventing the spread of the lethal COVID-19 scourge.

4.5 Respondents' Perceptions on Challenges That Affect teaching and learning of Ordinary Level Biology using online learning.

From the questionnaires, teacher respondents strongly agreed that availability of ICT resources (4 of 6); poor internet connectivity (5 of 6) as well as electricity availability (4 of 6) was major contributors to the factors that negatively impacted on the use of online learning in teaching and learning of Ordinary level Biology. This data is reflective that the teachers strongly agreed that the use of online learning platforms, especially during the COVID-19 era was dented by lack of ICT gadgets, poor internet availability consistent with other distant communities, as well as electricity availability caused by a Zimbabwean plummeting economy. The sentiments opined by teachers go hand in glove with findings by Sengere (2018), who avers that challenges of ICT itinerary as

well as electricity and internet inconsistency were detrimental to the teachers' efforts to use online learning in teaching and learning of Ordinary level Biology.

Furthermore, the results in Table 4.4 are also indicative that the teacher respondents agreed, though not strongly, that financial challenges (4), geographical location (3), encouragement of unwanted behaviour (5) and assessment challenges (3) were also contributory to the negative factors that impacted on use of online learning in teaching and learning of Ordinary level Biology. The sentiments of the teachers were that most learners are financially unstable and some of the learners are from geographical locations that have no facilities to support online learning. These sentiments support the ideas of Gurcan (2015) and Tsvere et al. (2013), who respectively submit that poverty in most rural families as well as geographical location of some learners, heavily militate on their efforts to access learning material through online learning. Similarly, the teachers also agreed that online learning had chances to nurture unwanted behaviour if unmonitored, and it was susceptible to cheating when carrying out assessments. Selwyn (2012) avers that if unmonitored, online learning can drive young people into deviancy and Faizi et al. (2013) contend that online assessments encourage cheating.

Still on the data in Table 4.4, some of the teachers strongly disagreed that they lacked technical expertise to help learners when using online learning (2). The teachers claimed that if given all the necessary resources, they would be in a position to assist learners at whatever level. These views are however in direct contrast to the opinions of Chiridza et al. (2016), who admits that the efforts to implement online learning in teaching and learning during Biology lessons were hampered by teachers' lack of technical expertise. One of teachers disagreed, though not strongly, that over-enrolment was a challenge in lesson delivery using online learning platforms. These teachers were of the opinion that in fact, online learning teaching and learning was the most ideal approach when

working with large classes. These sentiments disagree with Mathews (2016), who posits that individual attention would be difficult to observe during online learning for over-enrolled classes.

Furthermore, from interviews, as regards the challenges they encounter in their respective schools, all the Teachers (100%) lamented that there was inconsistent electricity supply and no Wi-Fi services, 60% argued that there were no computer laboratories and 90% indicated that there were inadequate ICT gadgets to enable them to fully implement online learning in teaching and learning of Ordinary level Biology. Though it was not able to prove, the researcher noted that some of these challenges were surmountable if parents of the learners were innovative enough to rope in online learning in teaching and learning. The challenges highlighted by Teachers were akin to what was found by Tunjera et al. (2014), who noted that lack of electrical power and Wi-Fi services derailed the implementation of online learning platforms in teaching and learning to a greater extent. Again, Gon and Rawekar (2017) also emphasized that schools should build computer laboratories as a precursor to use of online learning platforms to facilitate the teaching and learning process.

The Teachers also insisted that they were facing a litany of other challenges that militated on their efforts to rope in online learning as a teaching and learning platform. The majority of the Teachers (80%) indicated that they were not exposed to ICT appliances both at home and at school, hence their high level of computer illiteracy. Though it was not necessary for Teachers to be computer literate to enable effective implementation of online learning in teaching and learning, the researcher noted that the presence of computers in the home or at school was a necessity to motivate the Teachers to have massive interest in school work. Again, the Teachers indicated that online learning is very expensive (80%), it is affected by internet bandwidths (70%) and that it was

difficult for them to get valid and reliable assessment via online learning. The sentiments of the Teachers are congruous to the findings of Lee (2016) who avers that online learning is expensive and difficult to make assessment.

The teacher observed that there were no ICT gadgets in the schools.

4.6 Respondents' Perceptions on Mechanisms to Adopt to improve the use of Online learning in Teaching and Learning of Ordinary Level Biology

Results from questionnaires show that all teacher respondents (6) strongly agreed that there was need to closely monitor learners during online learning virtual lesson sessions and teachers need adequate remuneration to engage in online teaching and learning of Biology. These reflections imply that teachers feared that learners who are not monitored by their guardians or parents during ICT use may end up abusing the facility and teachers were also supposed to be adequately paid for services rendered during online lessons since they were more demanding than face-to-face lessons. The sentiments opined by the teacher respondents are akin to the ideas of Chiridza et al. (2016) and Tarisai and Manhivi (2017), who aver that if learners are not closely monitored during online learning teaching and learning, they may engage in cheating or other unscrupulous activities. The researcher however feels that since teachers are already on the government payroll even during lockdowns, they should not demand further remuneration when using online learning.

Again, 4 of the teachers agreed that it was the duty of schools to offer technical support to teachers to enable them to successfully engage in online learning teaching and learning approaches that can help in teaching and learning of Ordinary Level Biology. The sentiments of the teachers were that online learning involves extra costs as in ICT gadgets, internet data bundles as well as other supportive accessories, and without technical support from schools, individual teachers could not

initiate these from their own pockets. These sentiments go hand in glove with the findings of Duraku and Hoxha (2020), whose line of thinking is that if teachers are not given adequate itinerary for use in online learning lessons, especially during the COVID-19 era, the learners will not receive any learning material.

There were mixed feelings over the erection of common infrastructure for teachers to do their business in a single environment. Half of the teachers, 3 objected to erection of common infrastructure, while the other half, 3 saw it as a noble idea. The 3 teachers who disagreed to erection of infrastructure decried that it would spread contagious diseases, while those who agreed opined that it would be cheaper for schools and teachers as they would use school computers and pre-paid internet. The researcher noted that with proper disinfection of the venues, coupled with strict observance of WHO (2021) COVID-19 prevention protocols, this would be feasible as teachers would be catered for in terms of gadgets and internet costs.

Likewise, six teachers (84%) of the respondents also disagreed that they were supposed to improvise when preparing online learning material for learners, especially with the meagre incomes of teachers. The teachers argued that most ICT itinerary cannot be improvised, hence the need for schools to fully fund them if they want virtual learning to materialize. Nonetheless, Chick (2020) and Mugari (2020) postulate that teaches should be able to improvise, not only resources, but even teaching and learning techniques amidst online learning methods, to make learning more rewarding and meaningful.

From interviews, as regards mechanisms to put in place to improve online learning teaching and learning, the Teachers indicated that learners should be strictly monitored when they are using ICTs, as they came along with numerous shortcomings. This means that Teachers were aware and fearful that though computer technologies in online teaching and learning were beneficial to them,

there was also a likelihood that learners may engage in non-educative material that can hamper effective learning, especially if they work under no supervision. The researcher was fascinated by the Teachers' response as she realized that Teachers were also mindful that they could abuse ICTs if left unattended. This finding is analogous to the views of Chiridza et al. (2016), who hints that while use of ICTs in teaching and learning via online learning is instrumental, it requires meticulous attention and surveillance. Tarisai and Manhivi (2017) also recommends that whenever learners are using computers, they should be under the supervision of an older person, to dissuade them from accessing undesirable materials, in the form of pornography or nude pictures.

Moreover, the teachers also indicated that since teachers were in low spirits, the government was supposed to look into teachers' remuneration packages to motivate them to be innovative. The teachers indicated that teachers were facing widespread social and economic challenges that needed to be addressed before they could be tasked to engage in online learning using online learning approaches. These sentiments are parallel to ideas of Zimuto (2013) who argues that demotivated teachers are not innovative in terms of adopting new teaching and learning methodologies such as online learning. Again, the Teachers also felt that the government is supposed to weigh in with assistance to schools, since most of them are still operating without electricity and internet services. Tsvere et al. (2016) supports these sentiments by teachers, claiming most marginalized schools cannot do virtual learning.

4.7.Summary

This chapter presented the researcher's findings on statistical tables. The presented data was analyzed, discussed and interpreted in line with the research objectives. The next section, chapter 5, looks at conclusion of findings and recommendations

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The purpose is to provide the summary, conclusion and recommendations of the chapter. The study sought to find out the challenges facing both teachers and learners in the teaching and learning of Biology at Ordinary level via online learning. The study was answering the following questions: Challenges facing the implementation of online teaching and learning of ordinary level biology in schools in Mazvihwa area of Zvishavane district. The data obtained sought to answer the following questions; To what extent do biology teachers use online learning in teaching ordinary level biology? What are the benefits of using online learning in teaching biology at ordinary level? What challenges hamper the effective teaching and learning of ordinary level biology? What techniques can be adapted by educators to make use of online learning in teaching and learning of ordinary level biology?

5.2 Summary

The summary of question number one which sought to find out the extent to which biology teachers use online learning in teaching ordinary level biology. As regards the online learning

teaching and learning techniques being used by teachers and learners, it emerged that the majority of the teachers seconded the use of WhatsApp audios and groups as well as radio broadcasts. These methods were opted as the mostly used ones since they were cheaper and hence more accessible than other online learning approaches of teaching and learning. The gathered data also indicated that there was minimal use of televised learning, newspapers and a wide range of other online applications like Twitter, You-Tube or Facebook. The use of televised learning, newspapers and online applications was not only construed as expensive by the teachers, but also not feasible for learners in all geographical locations. Teachers claimed that though newspapers were good sources of contemporary information, they were both inaccessible and incompatible with learners from rural areas.

The second question sought to find out benefits of using online learning in teaching and learning of biology. As regards the merits of employing online learning in Biology lessons at Ordinary Level, the respondents indicated that online learning was beneficial in many ways as it improved their interactive skills, allowed them to work at their own pace in the comfort of their homes. This implies that the respondents opined that online learning was an effective way to improve pupil-pupil and teacher-pupil relations, a situation that accelerates skill acquisition in Biology lessons.

The third question sought to find challenges that affect teaching and learning of ordinary level biology using online learning platforms. As regards factors that militated on the teaching and learning of Ordinary level Biology through online learning, it was established that availability of ICT resources on both teachers and learners, poor internet connectivity as well as erratic availability of electricity are chief negative factors impacting on the teachers' efforts to integrate online learning online learning. Again, the respondents also lamented at the expensive nature of online learning bundles, learners' geographical location, assessment challenges and online

learning abuse as contributors to the downturn of the quality of teaching and learning of secondary school learners. This implies that respondents felt that online learning platforms were beyond the reach of many intended users as they are expensive. Again, the respondents indicated that some learners come from geographical locations devoid of both internet connectivity and even radio and television bandwidths, such that it was an uphill battle to bring them to online learning.

Nevertheless, the teachers refuted that they lacked technical expertise to implement online learning. The educators argued that although they were having challenges with use of various ICT gadgets to initiate teaching and learning of Biology via online learning, they would soon gather confidence and end up adjusting to international standards. Again, the results obtained indicated that the respondents were of the view that virtual learning was possible with over-enrolled classes, although they hinted that it was difficult to observe those who actively take part and those who are not actively engaged.

The fourth question sought to find ways of improving the use of online learning in Teaching and Learning of Biology at Ordinary level. On ways to improve the quality of teaching and learning of Biology at Ordinary level through online learning, especially during the COVID-19 era, respondents strongly believed that adequate remuneration was the best technique to motivate teachers to put concerted efforts and devise new mechanisms of assisting learners. Some teachers hinted that their counterparts in private schools who are receiving both adequate remuneration and technical support are implementing online learning and other virtual learning methods, and experiencing very positive outcomes. Other teachers also suggested being sent for refresher workshops and seminars and being given all the necessary resources that can facilitate the teaching and learning of Biology via online learning, was the best approach to rope it as an alternative approach.

5.3 Conclusion

The researcher observed that only those techniques that were cheap in the light of ordinary Zimbabweans were deemed most appropriate to implement in online learning, though in other countries, Twitters, Facebook, Skype and televised learning were commonly used. The researcher again noted that online learning was regarded as an effective approach when teachers and learners intend to work at their own pace and in the comfort of their homes – a condition that facilitated the prevention of the dreadful COVID-19 scourge. To add to that, teachers strongly noted that online learning was effective in addressing over-enrolment prevalent in most schools. The researcher concluded that online learning could appear challenging in the first days of its inception, but after a while, both learners and teachers would acclimatize. The researcher also concluded that with adequate support, teachers were ready to implement online learning teaching and learning. While common infrastructure was clamored for by respondents, the researcher also felt that its installation is a very good motive, which however requires users to regularly disinfect and observe the myriad of COVID-19 protocols envisioned by the WHO.

5.4 Recommendations

In the light of the findings of this research and in order to improve the quality of teaching and learning during the ever-escalating COVID-19 pandemic, the following recommendations were brought forward:

- The study should be carried on many schools to enable gathering of data from a remarkable population that can allow for generalization of findings.
- Schools should offer technical to teachers in terms of ICT gadgets and internet bundles to ease the process of virtual learning.
- The Zimbabwean government should also be on the ground with tangible assistance when recommending the implementation of online lessons, not heaping much of the burden on schools and the parent community.
- Parents of secondary school learners should be closer to their children to enable monitoring and evaluation during virtual learning.

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Appendix A: Observations Guide

My name is DOREEN PEDZISAI ZENDA B1437866 a bona-fide student at BINDURA UNIVERSITY OF SCIENCE EDUCATION. I'm doing my research in relation to the topic: challenges facing the implementation of online teaching and learning of ordinary level Biology in schools in two schools in Mazvihwa area of Zvishavane. I intend to gather data on challenges and opportunities available when using E-learning in the teaching and learning of BIOLOGY at Ordinary Level.

Item	Comments
Research question 1: are teachers participating in WhatsApp groups during online teaching and learning	
Research question 2: are learners participating in WhatsApp groups during online teaching and learning?	
Research question 3: is there common infrastructure in schools to facilitate online learning in biology?	
Research question 4: Do the schools have ICT gadgets?	
Research question 5: what is the general teacher - pupil ratio in the sampled school?	

Research question 6: Is electricity available at the school?	
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Appendix B: Questionnaire for teachers



My name is DOREEN PEDZISAI ZENDA B1437866 a bona-fide student at BINDURA UNIVERSITY OF SCIENCE EDUCATION. I'm doing my research in relation to the topic: challenges facing the implementation of online teaching and learning of ordinary level Biology in schools in two schools in Mazvihwa area of Zvishavane. I intend to gather data on challenges and opportunities available when using E-learning in the teaching and learning of BIOLOGY at Ordinary Level. Could you please fill in the questionnaire to the best of your knowledge? Do not write your name, and be assured that the data to be collected will be used only in this study.

Section A: Demographic Data

1. Sex: Male [] Female []
2. Age: Below 30 Years []
- Between 30 and 40 Years []
- Between 40 and 50 Years []
- Above 50 Years []

3. Educational Qualifications

- Certificate in Education []
- Diploma in Education []

Degreed (With Secondary Education) []

Degreed (Without Secondary Education) []

4. Working Experience

Less Than Five Years []

Between 5 and 10 Years []

Between 10 and 15 Years []

Above 15 Years []

Section B: Research Questions

Research question 1: Do you engage in online teaching and learning at your school?

Yes

No

If yes, which forms of online learning do you use in teaching and learning of Ordinary Level Biology?

Form of online learning	SA	A	D	SD
- WhatsApp platforms				
- Radio broadcasts				
- Televisions				
- Newspaper				
- You Tube, Skype, Twitter, Instagram				

Other (Specify).....

Research Question 2: What are the merits of using online learning in teaching and learning of Biology at Ordinary Level?

Possible benefit of using online learning	SA	A	D	SD

- Learners can progress at their own pace				
- Ensures uninterrupted content delivery				
- Best approach during the COVID-19 pandemic era				
- Enables Teachers to Work with Large Classes				
- Enables record keeping for future use				
- Develops communication and interactive skills				

Other (specify)

.....

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Research Question 3: Do you face challenges when using online learning in the teaching and learning of Biology at ordinary level?

Yes

No

If yes, what challenges are met when using online learning in teaching and learning of Ordinary Level Biology?

Possible Challenges Faced when using online learning in teaching and learning of Biology at Ordinary level	SA	A	D	SD
- Expensive way of teaching and learning				
- Geographical location				
- Availability of ICT resources				
- Lack of Technical Expertise				
- Does not suit all types of learners				
- Poor internet connectivity				

- Encourages undesirable behavioural traits				
- Assessment challenges				
- Availability of electricity				

Other (specify)

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Research Question 4: Are there mechanisms that can be implemented to improve the use of e-learning in teaching and learning of Biology?

Yes

No

If yes, what mechanisms can be implemented to improve the use of online learning in teaching and learning of Biology at Ordinary Level?

Possible Mechanism of Improving online learning use in teaching Biology	SA	A	D	SD
- Close monitoring of learners by parents and guardians				
- Work-shopping teachers on online learning and ICT usage				
- Schools should offer adequate technical support				
- Schools should erect common online learning infrastructure				
- Teachers should receive adequate remuneration				
- Teachers should have improvisation skills				

Other (specify)

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Appendix C: Interview Guide for School Heads and Biology Teachers



Section A: Demographic Data

- | | | |
|---------|-------------------------|---------------|
| 1. Sex: | Male [] | Female [] |
| 2. Age: | Below 30 Years | [] |
| | Between 30 and 40 Years | [] |
| | Between 40 and 50 Years | [] |
| | Above 50 Years | [] |

3. Educational Qualifications

- | | |
|-----------------------------|--------|
| Certificate in Education | [] |
| Diploma in Education | [] |
| Degreed (With Education) | [] |
| Degreed (Without Education) | [] |

4. Working Experience

- | | |
|----------------------|--------|
| Less Than Five Years | [] |
|----------------------|--------|

Between 5 and 10 Years []

Between 10 and 15 Years []

Above 15 Years []

SECTION B. RESEARCH QUESTIONS

1. To what extent is online learning used for teaching and learning of Biology at your school?

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2. How do you benefit from online learning use in the teaching and learning of Biology?

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3. What challenges do your teachers face in using online learning in teaching and learning of Biology?

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4. What do you think can be done to improve the use of online learning in teaching and learning of Biology at your school?

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SAMED

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BINDURA
ZIMBABWE

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Fax: 263 - 71 - 7616



BINDURA UNIVERSITY OF SCIENCE EDUCATION

Date: 09/04/24

TO WHOM IT MAY CONCERN

NAME: ZENDA DOREN P

REGISTRATION NUMBER: B437866

PROGRAMME: HBSED - BIOLOGY

PART: 2 2

This memo serves to confirm that the above is a bona fide student at Bindura University of Science Education in the Faculty of Science Education.

The student has to undertake research and thereafter present a Research Project in partial fulfillment of the HBSED - Biology programme. The research topic is:

challenges facing the implementation of online teaching and learning of ordinary level Biology in schools in Mazvihwa area of Zvishavane District.

In this regard, the department kindly requests your permission to allow the student to carry out his/her research in your institutions.

Your co-operation and assistance is greatly appreciated.

Thank you

Z Ndemo

Z Ndemo (Dr.)
CHAIRPERSON - SAMED

