

**HEALTH SCIENCES STUDENTS' PERCEPTIONS ON THE EFFECT OF E-LEARNING
DURING THE COVID-19 PANDEMIC AT THE UNIVERSITY OF WITWATERSRAND**

by

STEPHEN MONGWE

Submitted in partial fulfilment of the requirements for the degree

MASTER OF EDUCATION in OPEN DISTANCE LEARNING (ODL)

CURRICULUM AND INSTRUCTIONAL STUDIES

in the

COLLEGE OF EDUCATION

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISORS: PROF. G. VAN DEN BERG

PROF. P.K. MUDAU

DATE: 10 JANUARY 2023

DECLARATION

Name: Stephen Mongwe

Student number: 39426610

Degree: Master of Education in Open Distance Learning (ODL)

HEALTH SCIENCES STUDENTS' PERCEPTIONS ON THE EFFECT OF E-LEARNING DURING THE COVID-19 PANDEMIC AT THE UNIVERSITY OF WITWATERSRAND

I declare that the above mini dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.



SIGNATURE

10 January 2023

DATE

ABSTRACT

Since the COVID-19 pandemic, e-learning has become a hot topic in higher education worldwide. Because the pandemic led to restrictions on gatherings, higher education offerings shifted quickly from face-to-face to online delivery. E-learning adds to the flexibility and convenience of blended learning by allowing students to learn from wherever they are. This study investigated students' perceptions of the impact of e-learning at the University of the Witwatersrand (Wits) during the COVID-19 pandemic. Students have had three years of e-learning outside of campus since the outbreak of COVID-19. Using the faculty of Health Sciences' local and international students at Wits as the case study, this dissertation of limited scope adopted a qualitative research approach. Two theories of the 21st century, namely connectivism theory and social constructivism theory, were utilised to guide data search and analysis and understand the concepts. The study first conducted a pilot study with non-study participants to determine whether the questions intended to be used for data collection required revision. Afterwards, an online questionnaire with open-ended questions was completed by fourteen participants through Google Forms. The responses were analysed using participant characteristics, which included gender, age, place of study, nationality, and other factors. This study of limited scope found that e-learning offered students the opportunity to learn in the comfort of their own homes and allowed them to be more focused and develop better time management skills. In addition, e-learning is cheaper, which helps students save costs on transportation and accommodation. To address the digital divide among students, the educational institution should also make it mandatory for those who are not computer literate to attend basic computer courses. The study discovered that platforms such as Microsoft Teams, Zoom, eFundanathi, YouTube, and the student self-service portals and Sakai can be viewed as successful technologies for lecturers and students to use in e-learning. The study also discovered that providing data enabled students who lacked resources to study online because they did not have to worry about purchasing their own data. However, the educational institution's lack of technical support created additional difficulties for those who faced technological challenges while studying remotely. In conclusion, e-learning provides interactive learning through group discussions and allows for live streaming and real-time video sharing.

Keywords: 21st Century, COVID-19, Connectivism, E-learning, Social Constructivism, Health Sciences Students.

NKOMISO

Kusukela loko ku vile ni ntungu wa COVID-19, e-learning yi hundzukile mhaka ya nkoka eka dyondzo ya le henhla emisaveni hinkwayo. Hikokwalaho ka ntungu wu nga va ni xiave ka swipimelo eka tihlengeletano, ku dyondzisiwa ka dyondzo ya le henhla swi cincile hi ku hatlisa kusuka eka ku dyondza mi vonana ku ya eka tidyondzo ta ku tirhisa inthanete. E-learning yi engeterile ku olova na ku va swi koteka ku dyondzisa hi ku hlanganisa hi ku pfumelela swichudeni ku dyondza kusukela kun'wana ni kun'wana lomu swi nga kona. Ndzavisiso lowu wu lavisisile ni mavonelo ya vadyondzi ya nkucetelo wa miehleketo eka e-learning eYunivhesiti ya Witwatersrand (Wits) hi nkarhi wa ntungu wa COVID-19. Swichudeni swi vile ni e-learning eka malembe manharhu ehandle ka xivandla na miako ya yunivhesiti kusukela loko ku vile ni ntungu wa COVID-19. Ku tirhisa vuswikoti bya swichudeni swa kwala kaya na swa misava hinkwayo ka ntivovuxaka bya swa rihanyu eWits tanihi Xiyenge xa Dyondzo, xitsariwa lexi xa le henhla xi kongomisiwa eka digiri yo karhi eyunivhesiti xa mpimo lowu nga pimiwa lowu nga bohiwa wa maendlelo ya ndzavisiso wa nkoka. Tithiyori timbirhi ta malembexidzana ya makumembirhin'we, ku nga, thiyori ya nhlanganiso na thiyori ya vuswikoti bya swa vanhu, ti tirhisiwile ku letela ku lava datara na nkambisiso na ku twisisa tikhonsepe. Ndzavisiso wu sungula hi ku letela dyondzo ya muhahisi na dyondzo yo hava vatekaxiave ku kumisisa loko swivutiso leswi ku nga kunguhateriwa ku tirhisiwaka ka nhlengeleto wa switiviwa wu lava mpfuxeto. Endzhaku ka sweswo, nuvu wa swivutiso leswi kumekaka eka inthanete leswi tsariweke swi hlamula hi mani na mani na swivutiso swo kala swipimelo swi hetisiwile hi mune wa vatekaxiave hi ku tirhisa Tifomo ta Google. Tinhlamulo ti kamberiwile hi ku tirhisa swihlawulekisi swa va tekaxiave, leswi katsaka rimbewu, malembe, ndhawu yo dyondzela, vuakatiko bya le nawini, na swivangelo swin'wana. Ndzavisiso lowu wa mpimo lowu pimiweke lowu kumekaka eka e-learning lowu nyikiwaka vadyondzi nkateko wo dyondza eka ntshamiseko wa vona vinyi emakaya na ku va pfumelela ku va va kongomisa ngopfu na ku antswisa swikili swa vona vinyi swa mahlawulelo ya kahle ya nkarhi. Ku engetela, e-learning ya olova, leswi swi pfunaka swichudeni ku hlayisa tihakelo ta swofamba na vutshamo. Ku lulamisa vangwa ra swa digitali leri nga kona exikarhi ka swichudeni, ndhawu ya swa dyondzo nakambe yi fanele ku endla leswaku yi nyika matimba ka lava vanga riki ni vutivi bya khomphyuta ku dyondza tidyondzo ta masungulo ta khomphyuta.

Ndzavisiso wu kumile leswaku swivandla swo fana ni swo tanihi Microsoft Teams, Zoom, eFundanathi, YouTube, na ku va tinyangwa na Sakai xichudeni xa tikorhokela swi nga ha tekiwa tanihi ku humelela ka thekinoloji eka valeteri na swichudeni ku tirhisa e-learning.

Nakambe ndzavisiso wu kumile leswaku ku nyika data swi pfunile swichudeni leswi a swi pfumala switirhisiwa ku dyondza hi inthanete hikuva a swi fanelangi ku va swi vilela hi mayelana ni ku xava data ya vona vinyi. Hambiswiritano, ku pfumaleka ka nseketelo wa swa thekiniki hi xiyenge xa swa dyondzo swi tumbuluxile swo engetela ku tikeriwa ka lava a va hlangana ni mitlhontlho ya swa thekinoloji loko va karhi va dyondza hi ndlela ya xikhale swinene. Xo hetelela, e-learning yi pfumelela ku dyondza hi ku hlanganyisa hi ku tirhisa mikanerisano ya mitlawa na ku pfumelela ku xaxameta swilo swi vonaka na ku avelana mpimo wa nkarhi wa vhidiyo.

Marito ya nkoka: malembexidzana ya makumbembirhin'we, COVID-19, thiyori ya Vuswikoti, E-learning, thiyori ya vuswikoti bya swa Vanhu, Swichudeni swa xiyenge xa rihanyo ra swa sayense.

ABSTRAK

Sedert die COVID-19-pandemie is e-leer wêreldwyd 'n gewilde onderwerp in hoër onderwys. Aangesien die pandemie tot beperkings op byeenkomste gelei het, het hoëronderwysaanbiedinge vinnig van aangesig tot aangesig na aanlyn lewering verskuif. E-leer dra by tot die buigzaamheid en gerief van gemengde leer deur studente toe te laat om te leer waar hulle ook al is. Hierdie studie het studente se persepsies van die impak van e-leer by die Universiteit van die Witwatersrand (Wits) tydens die COVID-19-pandemie ondersoek. Studente het drie jaar van e-leer buite die kampus gehad sedert die aanvang van COVID-19. Deur die Fakulteit van Gesondheidswetenskappe se plaaslike en internasionale studente by Wits as die gevallestudie te gebruik, het hierdie proefskrif van beperkte omvang 'n kwalitatiewe navorsingsbenadering aanvaar. Twee teorieë van die 21ste eeu, naamlik konnektivisme en sosiale konstruktivisme, is gebruik om data te soek en te ontleed en die konsepte te verstaan. Die studie het eers 'n loodsondersoek met nie-deelnemers uitgevoer om te bepaal of die vrae wat vir data-insameling bedoel is, hersien moes word. Daarna is 'n aanlyn vraelys met oop vrae deur veertien deelnemers op Google Forms voltooi. Die antwoorde is ontleed deur gebruik te maak van deelnemereienskappe, wat geslag, ouderdom, plek van studie, nasionaliteit en ander faktore ingesluit het. Hierdie studie van beperkte omvang het bevind dat die studente die geleentheid gebruik het om in die gemak van hulle eie huise te leer en hulle in staat gestel het om meer gefokus te wees en beter tydsvaardighede te ontwikkel. Boonop is e-leer goedkoper, wat studente help om koste op vervoer en verblyf te bespaar. Om die digitale kloof tussen studente aan te spreek, moet die opvoedkundige instelling dit ook verpligtend maak vir diegene wat nie rekenaarvaardig is nie om basiese rekenaarkursusse by te woon. Die studie het bevind dat platforms soos Microsoft Teams, Zoom, eFundanathi, YouTube, en die studenteselfdiensportale en Sakai beskou kan word as suksesvolle tegnologieë vir dosente en studente om in e-leer te gebruik. Die studie het ook bevind dat die voorsiening van data aan studente wat nie hulpbronne het nie, hulle in staat gestel het om aanlyn te studeer aangesien hulle nie hulle eie data moes aankoop nie. Die opvoedkundige instellings se gebrek aan tegniese ondersteuning het egter bykomende probleme geskep vir diegene met tegnologiese uitdagings wat op 'n afstand studeer. Die gevolgtrekking is dat e-leer interaktiewe leer bied deur groepbesprekings en voorsiening maak vir regstreekse stroming en intydse video-deel.

Sleutelwoorde: 21ste eeu, COVID-19, konnektivisme, e-leer, sosiale konstruktivisme, Gesondheidswetenskapstudente.

DEDICATION

- This mini dissertation is dedicated to my late grandparents, Mackson Mpezana Mongwe and Somisa Mphemphu Mongwe. They played an important role in my upbringing and were always there for me when I was young until the good Lord took their beautiful souls, which I believe are now resting in peace. It is unfortunate that they could not see the fruits of their teachings since I finished my undergraduate studies.
- I would also be doing an injustice if I did not dedicate this study to all students worldwide who studied via e-learning while their countries were shut down due to COVID-19. I applaud all of you for persevering in the face of a pandemic.

ACKNOWLEDGEMENTS

- I would like to express my gratitude to my supervisors, Professor Geesje van den Berg and Patience Kelebogile Mudau, for their patience, dedication, support, and guidance during the two years I was enrolled in the Master's programme through coursework and this study. Throughout my studies at the University of South Africa, their availability and prompt response and feedback has been the most valuable asset.
- To my wife, Mesiah Mukansi-Mongwe, and our two beautiful children, Rito and Vonani Musa Mongwe, I thank you for understanding my absence from your lives when you needed me the most. There were times when I felt like I was failing my wife as a co-parent to our children because she continued to help our children with their homework while I attended to my educational duties.
- To my mother, Anna Timisa Mongwe, you have been a pillar of strength for me. As a single parent, you have always encouraged me to excel in my studies. N'waBoqedaka, I am grateful.
- I am grateful to the University of the Witwatersrand for funding my studies as well as for granting me permission to conduct the research at the University. Thank you, too, to those who agreed to participate in the study.
- I am thankful to everyone who encouraged me to pursue this study, even if I do not mention names.
- Thank you to Ms Sarah Coutts, the professional editor, for proofreading my study.
- Thank you to my uncle Mkomati John Mongwe for translating my study's abstract into Xitsonga and the Unisa language experts for translating it into Afrikaans.
- Finally, I want to thank God for his guidance and love throughout this study. God has always been a source of strength for me, and even when I felt like giving up, He encouraged me to keep going until I got this far.

TABLE OF CONTENTS

<u>DECLARATION</u>	<u>ii</u>
<u>ABSTRACT.....</u>	<u>iii</u>
<u>NKOMISO</u>	<u>iv</u>
<u>ABSTRAK.....</u>	<u>vi</u>
<u>DEDICATION</u>	<u>vii</u>
<u>ACKNOWLEDGEMENTS</u>	<u>viii</u>
<u>TITLE: HEALTH SCIENCES STUDENTS’ PERCEPTIONS ON THE EFFECT OF E-LEARNING DURING THE COVID-19 PANDEMIC AT THE UNIVERSITY OF WITWATERSRAND</u>	<u>1</u>
<u>CHAPTER 1: ORIENTATION AND BACKGROUND.....</u>	<u>1</u>
1.1 INTRODUCTION.....	1
1.2 BACKGROUND TO THE RESEARCH.....	3
1.3 PROBLEM FORMULATION	5
1.4 RESEARCH QUESTION(S).....	7
1.5 AIM OF THE RESEARCH.....	7
1.6 THEORETICAL FRAMEWORK.....	8
1.7 RESEARCH DESIGN	9
1.7.1 RESEARCH PARADIGM	9
1.7.2 Research approach	10
1.7.3 Research type.....	11
1.8 RESEARCH METHODS	11
1.8.1 Selection of participants	12
1.8.2 Sampling.....	12
1.8.3 Data collection	14
1.8.4 Data analysis	14

1.10 RESEARCH PLAN OF ACTION.....	16
1.11 TRUSTWORTHINESS OF THE STUDY	18
1.12 CLARIFICATION OF CONCEPTS.....	18
1.13 DIVISION OF CHAPTERS	20
1.14 CONCLUSION	21
<u>CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK</u>	<u>22</u>
2.1 INTRODUCTION.....	22
2.2 THEORETICAL FRAMEWORK.....	22
2.2.1 Connectivism	23
2.2.2 Social constructivism	24
2.3 EDUCATIONAL POLICY AND PRACTICE	26
2.3.1 Policies guiding e-learning in higher education	27
2.3.1.2 Wits’s Academic Administration Online Learning and Teaching policy .	28
2.4 BENEFITS OF E-LEARNING	29
2.5 LIMITATIONS OF E-LEARNING	31
2.5 E-LEARNING DURING COVID-19 AND STUDENT MOTIVATION	32
2.6 TYPES OF E-LEARNING	33
2.7 MANAGEMENT OF E-LEARNING AND STUDENT SUPPORT SERVICES	35
2.8 CONCLUSION	38
<u>CHAPTER 3: RESEARCH METHODOLOGY.....</u>	<u>39</u>
3.1 INTRODUCTION.....	39
3.2 RATIONALE FOR EMPIRICAL RESEARCH	39
3.3 RESEARCH DESIGN	40
3.3.1 Research paradigm	41
3.3.2 Research approach	41
3.3.3 Research type.....	42
3.4 SELECTION OF PARTICIPANTS	43

3.5 DATA COLLECTION TOOLS AND PROCEDURES.....	45
3.5.1 Online open-ended questionnaires.....	46
3.6 DATA ANALYSIS	47
3.7 MEASURES OF TRUSTWORTHINESS.....	48
3.8 ETHICAL CONSIDERATIONS	49
3.9 CONCLUSION	50
<u>CHAPTER 4: DATA ANALYSIS AND INTERPRETATION OF FINDINGS.....</u>	<u>51</u>
4.1 INTRODUCTION.....	51
4.2 PARTICIPANTS' DEMOGRAPHICS	51
4.3 PRESENTATION OF THE FINDINGS FROM THE QUESTIONNAIRES	53
4.3.1 Research themes.....	53
4.3.1.1 Theme 1: The impact of e-learning on students and access to internet	54
4.3.1.1a Sub theme: Impact of e-learning in comparison to F2F learning	58
4.3.1.1b Sub theme: Fulfilment of e-learning during COVID-19 pandemic	60
4.3.1.1c Sub theme: Challenges that affected students in the implementation of e-learning.	60
4.3.1.2 Theme 2: Technologies used to implement e-learning	61
4.3.1.3 Theme 3: E-learning support provided by Wits	62
4.3.1.3a Sub theme: Benefits offered by e-learning during/post COVID-19	64
4.3.1.3b Sub theme: Exploring e-learning	65
4.3.1.4 Theme 4: Emerging technologies in education	66
4.3.1.4a Sub theme: Strategies to be used for e-learning using emerging technologies.....	68
4.4 Conclusion.....	69
<u>CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS</u>	<u>70</u>
5.1 INTRODUCTION.....	70
5.2 SUMMARY OF THE LITERATURE	70
5.3 SUMMARY OF EMPIRICAL STUDY	72
5.3.1 Technologies used to implement e-learning.....	75
5.3.2 E-learning support provided by Wits.....	76
5.3.3 Emerging technologies in education.....	77
5.4 SYNTHESIS OF RESEARCH FINDINGS	78

5.5 CONCLUSIONS.....	79
5.5.1 Research Question1 (RQ1): What influence did e-learning have on health sciences students at Wits during COVID-19?	80
5.5.2 RQ2: Which available support/technologies for e-learning platforms were available to health sciences students?	80
5.5.3 RQ3: How did the measures taken by Wits to support health sciences students assist in implementing e-learning?	81
5.5.4 RQ4: What e-learning possibilities emerged from Wits’s health sciences students during/post-pandemic environment?	82
Main research question: What are health sciences students’ perceptions of the effect of e-learning at Wits during the COVID-19 pandemic?	82
5.6 RECOMMENDATIONS.....	83
5.6.1 Recommendations to Wits management	83
5.6.2 Recommendations to e-learning course instructors	83
5.6.3 Recommendations to e-learning course developers	84
5.6.4 Recommendations to e-learning students	84
5.7 SUGGESTIONS FOR FURTHER RESEARCH	84
5.8 LIMITATIONS OF THE STUDY	85
5.9 CONCLUSION	86
<u>LIST OF REFERENCES</u>	<u>87</u>
<u>APPENDIXES</u>	<u>103</u>
<u>APPENDIX A: PARTICIPANT INFORMATION</u>	<u>103</u>
<u>APPENDIX B: CONSENT FORMS</u>	<u>104</u>
<u>APPENDIX C: DECLARATION LETTER TO HEALTH SCIENCES ETHICS COMMITTEE</u>	<u>105</u>
<u>APPENDIX D: LETTER TO WITS DEPUTY REGISTRAR REQUESTING CLEARANCE</u>	<u>106</u>
<u>APPENDIX E: ONLINE QUESTIONNAIRE</u>	<u>107</u>
<u>APPENDIX F: ETHICS CLEARANCE TRAINING CERTIFICATE</u>	<u>109</u>

APPENDIX G: UNISA ETHICS CLEARANCE CERTIFICATE110

APPENDIX H: HEALTH SCIENCES ETHICS CLEARANCE CERTIFICATE.....112

APPENDIX I: ETHICS CLEARANCE CERTIFICATE FROM WITS DEPUTY REGISTRAR
.....113

LIST OF TABLES

Table number	Table description	Page number
Table 1.10. 1	Research plan of action	16
Table 4.3.1	Research themes	53
Table 4.2.1	Summary of student's participants demographic information	51
Table 4.3.1a	Sub themes on the impact of e-learning on students and access to internet	57
Table 4.3.1b	Research sub themes on support provided by Wits on e-learning	64
Table 4.3.1c	Strategies to be used for e-learning using emerging technologies	68

LIST OF ACRONYMS

Acronyms	Full Description
CLM	Commerce, Law, and Management
DHET	Department of Higher Education and Training
EBE	Engineering and the Built Environment
ICT	Information and Communication Technology
IT	Information Technology
LMS	Learning Management System
MMed	Master of Medicine
MPH	Master of Public Health
MSc Med	Master of Science in Medicine
ODL	Open and Distance Learning
OECD	The Organisation for Economic Cooperation and Development
PhD	Doctor of Philosophy
RQ	Research question
SA	South Africa
UNISA	University of South Africa
WITS	University of the Witwatersrand
WHO	World Health Organisation

LIST OF FIGURES

Figure 4.3.1.1.1 Students' e-learning options during COVID-1967

TITLE: HEALTH SCIENCES STUDENTS' PERCEPTIONS ON THE EFFECT OF E-LEARNING DURING THE COVID-19 PANDEMIC AT THE UNIVERSITY OF WITWATERSRAND

CHAPTER 1: ORIENTATION AND BACKGROUND

1.1 INTRODUCTION

In this dissertation of limited scope, it is noted that the use of e-learning was frequently used in implementing teaching and learning during national and international lockdowns due to the COVID-19 pandemic; it also assisted students in developing digital skills that they will use after studies in their workplace (Alsoud and Harasis, 2021; Addah, 2012). Therefore, since the outbreak of COVID-19 in December 2019 has made face-to-face learning to shift to e-learning overnight, and the technological tools at our disposal made it possible (Fathoni and Retnawati, 2021). Moreover, most African contact or face-to-face educational institutions had the opportunity to use e-learning to complete academic years successfully during and after COVID-19 (Mpungose, 2020). Traditional classrooms have been transformed into virtual learning environments using tools like Zoom, Microsoft Teams, and YouTube. These systems provide a variety of features that let lecturers communicate with students, interact with them, and promote interactive learning, as a result, institutions worldwide took advantage of every feature that existing technology could provide to change the methods of delivery of material (Pal and Vanijja, 2020). In addition, e-learning enabled students to connect with lecturers while gathering more information through technology in the digital era.

Even though e-learning was popular in European, Asian, and North American countries prior to COVID-19, some African countries were unable to implement it until the COVID-19 outbreak made it essential to do so. According to Kaisara and Bwalya (2021) when the world faced difficulties addressing the pandemic through a lockdown where students were permitted to study online, the majority of European countries, who had already adopted e-learning, faced relatively few difficulties. However, African countries, which had not yet adopted e-learning, encountered significant difficulties (Kaisara and Bwalya, 2021). Akpan-Obong (2021) mentions that Covenant University and the American National University (both in Nigeria), as well as the University of KwaZulu-Natal in South Africa (SA), have long used learning management systems such as Moodle, Blackboard, and Canvas. Akpan-Obong

(2021) further states that many of these institutions merely used the LMS as a repository for digital resources. According to Akpan-Obong (2021), these platforms were thought to be nice extras with little educational value. Akpan-Obong (2021) further posits that, as a result, faculty members were not required to be knowledgeable about online teaching methods and processes. Furthermore, there was insufficient policy or guidelines for online education (Mpungose, 2020). Akpan-Obong (2021) also mentions that students who had access to ICTs perceived them as tools for personal communication or social networking rather than educational tools. As a result, when the pandemic forced a worldwide shutdown, many African universities were unprepared to use ICTs effectively in their educational systems (Akpan-Obong, 2021). In this digital era, technology plays a big role because it is the future of education in the Fourth Industrial Revolution (Tejedor, Cervi, Pérez-Escoda, Tusa, and Parola, 2021). E-learning is the best alternative available to ensure that diseases do not spread since it supports spatial distance (Maatuk, Elberkawi, Aljawarneh, Rashaideh, and Alharbi, 2022).

According to the Organisation for Economic Co-operation and Development (OECD) (2005), e-learning is the use of information and communications technology to improve or support learning in tertiary education. Saiyad, Virk, Mahajan et al. (2020) posit that the delivery of instructional information, student engagement, and the promotion of interactive learning experiences are all part of e-learning, which includes the use of digital tools, platforms, and resources. Wong (2017) posits that e-learning refers to learning that uses electronic technologies to access educational curriculum outside of a traditional classroom. Pravat (2020) argues that the emergence of the COVID-19 pandemic disrupted the education sector worldwide, particularly the learning institutions that never had e-learning facilities. Radha, Mahalakshmi, Kumar, and Saravanakumar (2020) mention that e-learning experienced a prompt growth and proved to be the best in education during COVID-19. Cordington and Grant-Marshall (2011) indicate that education has become a large and intensely competitive industry. Educational institutions have to change quickly to keep up with new trends.

Bhat, Raju, Bikramjit, and D'Souza (2018) point out that there are great ways for students to have control over their own learning when using e-learning platforms. Maatuk, Elberkawi, Aljawarneh, Rashaideh, and Alharbi. (2021) state that most educational institutions have recently introduced e-learning as a tool for learning and teaching during the recent COVID-

19 pandemic. Students can receive learning and study resources without having to rely on face-to-face classes to begin and receive materials. E-learning offers useful features, such as easy access to learning resources and flexibility (Ananga, 2020). Ayu (2020) argues that e-learning has the potential to transform teaching and learning across the board. Those involved in this type of learning benefit from being able to access materials quickly and receive immediate feedback from their lecturers and peers. E-learning also provides more interactive materials that allow easy access to information and feedback from students (Ayu, 2020).

Based on the scholars cited above, e-learning offers flexibility in terms of time and place, resulting in greater ownership and control for students. Furthermore, with e-learning, students can communicate with peers from all over the world through group discussions, and as a result, the study material can be accessed a limitless number of times. E-learning has gradually become a predominant learning approach in higher educational institutions due to the fast growth of internet technologies and the recent emergence of COVID-19 (Chopra, Madan, Jaisingh, and Bhaskar, 2019).

1.2 BACKGROUND TO THE RESEARCH

The world has witnessed a major change in all spheres of life from the time when COVID-19 was identified in December 2019. In Africa, the first case of the COVID-19 was reported in Egypt in February 2020, followed by Algeria in the same month (WHO, 2020). In South Africa, which is the home country of the University of the Witwatersrand (Wits) where the current study was conducted, the National Institute for Communicable Diseases (NICD) reported the first case of COVID-19 on 5 March 2020. Higher education institutions had to experiment with and adopt instructional styles to meet evolving educational demands as they cope with a range of issues, like COVID-19: one of these is e-learning (Ananga, 2020). Accordingly, the education sector was hard hit; therefore, institutions were forced to adjust their policies/curricula, which saw the implementation of e-learning at Wits. The University adopted a blended learning approach in which students learnt through electronic and online media in addition to traditional face-to-face instruction. The institution's chosen method of delivery provided excellent opportunities for both instructors and students to engage in teaching and learning outside of the traditional classroom. Wits provided 5,000 laptops to disadvantaged students as well as 30GB of data per month to all students in order to roll out e-learning

successfully (Wits COVID-19 update, 2020). Additionally, Wits's websites were zero-rated to provide all students with unlimited access to educational information from the moment they switched to online learning (Universityworldnews, 2020). What has been done in Wits, is supported by Blackman (2021) that having a data plan, developing zero-rated sites, and ensuring that students have access to laptops and tablets does help to save money, and fulfillment in e-learning environments is significantly reliant on student assistance and resources.

Despite the University's efforts to assist disadvantaged students, the Wits community encountered several obstacles, such as ensuring that students and instructors were prepared for online learning. When the University switched to e-learning, the initial transition of tests to online was quite difficult since they had to go from writing on paper to typing; since most students could not type fast enough, time was a big issue in terms of finishing tests. Additionally, students had to use third-party systems that consumed more data than the University offered (zero-rated sites were not trustworthy in delivering lectures online in 2020; this was only rectified in 2021), and there was no information technology (IT) assistance for Saturday lessons.

As a member of the health sciences faculty, the researcher witnessed how Wits struggled with difficult teaching and learning conditions as a result of COVID-19 restrictions since staff and students had not been properly introduced to e-learning. Health sciences and other departments within the University mitigated the risk of COVID-19 infections by adopting blended teaching and learning. Online/remote teaching and learning limited face-to-face (F2F) teaching sessions, and teaching in clinical settings were employed in the health sciences. The University also used online or remote assessments as well as F2F venue-based assessments. The clinical environment in health sciences encompasses inpatient, hospital outpatient, and community settings, each with its own set of difficulties such as attending to surgeries, childbirth, and psychiatric care. For these reasons, the health sciences faculty adopted blended learning to accommodate students who were required to do practical work with patients in hospitals. Furthermore, in the clinical setting, students who dealt with patients and their problems were at the core of direct teaching and learning as they had to conduct patient consultations and physical examinations for all common medical diseases as well as assess and treat patients in casualty or emergency wards.

According to Mohanan and D'silva (2020), learning has stepped into the digital world in which instructors and students are virtually connected; therefore, e-learning is easy to implement and understand. Mohanan and D'silva (2020) reveal that the majority of students agreed to e-learning as an attractive learning environment that assists in acquiring new ideas. E-learning allows for the improvement of knowledge and abilities from anywhere and at any time (Babu and Sridevi, 2018). Ravanelli and Serina (2014) mention that e-learning is able to address the issues of space and time as well as the separation that exists between the inner and outer space, so F2F and distance learning are easily dealt with. According to Al-Saggaf and Rosli (2021), e-learning helps instructors and students to develop a sense of collaboration through teaching and learning respectively. COVID-19 has shown that e-learning is no longer a luxury but a critical factor in the education process (Jantjies, 2020). Jantjies (2020) further points out that the current effects of the pandemic have kept students and lectures at home, and this has compelled a move to e-learning by Wits. In their study, Mohanan and D'silva (2020) discovered that e-learning aids users in quickly finding material and thus improves learning quality. This study looked at existing support and technologies for e-learning platforms available to health sciences students whereas the above literature did not.

1.3 PROBLEM FORMULATION

Most Wits students, academics, and support staff had never used platforms like Zoom or Microsoft Teams, which are two common technologies used to execute e-learning, when the country was placed on hard lockdown in 2020 because of COVID-19. The University was overwhelmed with student requests for e-learning assistance. Students and faculty at Wits were hampered by a lack of skills and infrastructure as COVID-19 spread throughout South Africa in 2020, but Wits made efforts to incorporate e-learning into the classroom. Students and employees in the educational sector played an important role in the implementation and related consequences of e-learning (Maatuk *et al.*, 2022). Therefore, it is important to determine how students at Wits's Faculty of Health Sciences dealt with e-learning during the COVID-19 pandemic.

Some Wits students are from rural or low-income backgrounds, and they were forced to return to their homes when the country went into lockdown. Poor infrastructure in these rural areas and limited resources in homes posed challenges for students in accessing information

(Tadesse and Muluye, 2020). Aristovnik, Aleksander, Damijana Keržič et al. (2020) state that students from undeveloped, remote, and rural areas had challenges with poor internet access or even a lack of electricity. In comparison, students from urban areas were less likely to have these same challenges. Transferring from their Wits residence to rural areas made it difficult for rural students to access internet at their houses. However, because they were learning from the comfort of their own homes rather than having to attend actual classrooms, all students were able to save costs on transportation, stationery, and accommodation.

Wits has continued its commitment to minimizing learning disruptions that began during the pandemic. i.e., This commitment is ongoing despite the restrictions of the pandemic having been lifted. E-learning allows students to work together with lecturers and peers simultaneously through multiple media, including text, live video, file sharing and live blogs (Boyd and Ellison, 2007; Cofield, 2002; Kim, Lee, Shin, and Yang, 2017). Elfaki, Abdulraheem and Abdulrahim (2019) state that e-learning is a teaching and learning method that is based on the use of electronic media and devices as tools in knowledge sharing for enhancing the availability of training, communication, and interaction, and that aids in accepting new ways of comprehending and establishing learning. When the world was hit by COVID-19, all methods of distributing knowledge were relocated online in an exceptional effort to maintain the continuity of education, according to Nedelcu (2020).

Although the University offered e-learning during COVID-19, few students at Wits had used e-learning prior to the 2020 academic year; therefore, e-learning was new to them. It is unclear how health sciences students perceived effective e-learning during the COVID-19 pandemic at Wits, or how they reacted to a delivery method they were unfamiliar with; thus, this study investigated the effectiveness of e-learning for health sciences students at this university. Finally, it is also critical to determine whether e-learning is necessary in a post-pandemic environment where more e-learning will be used.

1.4 RESEARCH QUESTION(S)

Based on the research problem statement of the study, the following main research question is formulated:

What are health sciences students' perceptions of the effect of e-learning at Wits during the COVID-19 pandemic?

From the main question, the following sub-questions are stated:

- i. What influence did e-learning have on health sciences students at Wits during COVID-19?
- ii. Which available support/technologies for e-learning platforms were available to health sciences students?
- iii. How did the measures taken by Wits to support health sciences students assist in implementing e-learning?
- iv. What e-learning possibilities emerged for Wits health sciences students during/post-pandemic environment?

1.5 AIM OF THE RESEARCH

From the research questions, the aim and objectives are formulated as follows:

The aim of the study is to examine the health sciences students' perceptions of the effect of e-learning at Wits during the COVID-19 pandemic.

The specific objectives of the proposed study are:

- i. To identify the prevailing influence of e-learning on students during COVID-19.
- ii. To identify available support/technologies for e-learning platforms required by Wits health sciences students.
- iii. To determine the measures taken by Wits to support health sciences students during the COVID-19 pandemic.
- iv. To establish the opportunities emerging from e-learning.

1.6 THEORETICAL FRAMEWORK

According to Kivunja (2018), a theoretical framework is made up of theories expressed by experts in the field into which the researcher intends to conduct research and draw upon to provide a theoretical coat hanger for data analysis and result interpretation. The theoretical framework provides a well-defined and proven basis of argument for the study as well as an explanation of its significance and validity. It also demonstrates where the researcher intends to close knowledge and practice gaps. According to Kivunja (2018), a theoretical framework is a synthesis of the ideas of giants in the field of study as they pertain to research; it also assists in the interpretation of theories and the planning of how to apply those theories to the facts collected by the researcher. The connectivist and social constructivism theories served as a framework for investigating health sciences students' experiences of e-learning at Wits during COVID-19.

Siemens and Downes (2015) define connectivism as a 21st-century learning theory that explains how Internet technologies have expanded people's ability to study and share information across the Internet and among themselves. The connectivist theory of education not only views students as assets who can take care of their own learning and also more adaptable to contemporary technological breakthroughs (Decuypere, 2019). At present, theories such as social constructivism learning theory have also become influential in the context of online learning. Chikwanda (2020) posit that social constructivism supports the theoretical underpinning for mobile pedagogy in that knowledge is built on the students' experiences. With constructivism, instead of being spoon fed, students are encouraged to build their own knowledge as argued by Ananga (2020). Jie, Puteh, and Sazalli (2020) mention that constructivism promotes a student-centered paradigm, collaborative interaction, and a situational learning information environment in this evolving dynamic.

At Wits, students were connected during COVID-19 because the Faculty of Health Sciences has employed e-learning to finish their academic years since COVID-19 began. This study's theoretical framework is thus based on connectivism, a digital age learning theory that employs collaborative e-learning, and Social Constructivism theory, which allows students to construct their own understanding actively through social interaction with their peers; these frameworks will be discussed further in Chapter 2 of this study.

1.7 RESEARCH DESIGN

According to Hays and McKibben (2021) the term research design refers to the overarching strategy or plan that describes how a research study will be carried out, including the procedures, methods, and techniques that will be used to gather and analyse data. In addition, Hays and McKibben (2021) contend that research design provides a roadmap for researchers to handle their study queries or goals, test hypotheses, or analyse intriguing events. The research design, according to Sileyew (2019), provides an acceptable structure for a study. The choice of research approach is a critical selection in the research design process because it affects how relevant information for a study will be gathered; yet, the research design process entails a number of interconnected decisions, as argued by Sileyew (2019). This design will aid in the collection of data from a wide range of participants regarding the influence of e-learning on health sciences students at Wits. Lastly, the research design incorporates the study paradigm, approach, and type as explained below.

1.7.1 RESEARCH PARADIGM

The term “paradigm” was coined by Thomas Kuhn in 1962 to describe a philosophical manner of thinking. The phrase “research paradigm” was defined by Kamal (2019) as a way of looking at the world that determines a research topic and impacts how academics perceive it. Paradigms are significant because they provide beliefs and demands that determine what should be examined, how it should be studied, and how the study's results should be understood for scholars in a particular discipline. A research paradigm, according to Khatri (2020), is a set of assumptions about how particular problems arise as well as a set of agreements on how such problems might be investigated. Tualaulelei and McFall-McCaffery (2019) argue that determining a research paradigm is an important part of any thorough research undertaking. Tualaulelei and McFall-McCaffery (2019) also mention that there are numerous paradigms through which research can be conducted. Positivism, postpositivism, constructivism/interpretivism, and critical theory are some of the major schools of thought (Tualaulelei and McFall-McCaffery, 2019).

This research employed a constructivist research paradigm in order to explore the universe of human experience. The constructivist research paradigm was chosen because it aided the researcher in gaining a comprehensive picture of how participants construct their own

understanding and knowledge of the world through experience and reflection (Kamal, 2019). Kamal (2019) argue that the constructivist paradigm holds that a research's methodology should investigate the minds and meaning-making, sense-making activities, as is frequently done in qualitative research. James and James (2022) mention that constructivism opposes the notion that there is mechanically retrievable, objective information in some external reality. Instead, the knowledge that is created through interaction with the phenomena and study participants is influenced by the researcher's attitudes and dispositions.

1.7.2 Research approach

The three most common approaches to research are quantitative, qualitative, and mixed methods. Quantitative research, according to Loewen and Plonsky (2015), use objective measures such as tests and surveys as well as statistical and numerical data processing tools. In quantitative research, descriptive statistics and inferential statistics are the two basic types of data analysis (Taguchi, 2018). Cai (2018) argue that mixed methods research entails gathering both quantitative and qualitative data in a single study, with the data collected concurrently or sequentially, prioritised, and data integrated.

Johnson, Adkins, and Chauvin (2020) argue that case study, personal experience, introspection, life narrative, interview, artifacts, cultural texts and creations, observational historical, interactional, and visual texts that explain the regular and difficult moments and meanings in individual lives are all examples of qualitative research. Johnson *et al.* (2020) posit that qualitative research methodology assists in the implementation of a wide variety of interconnected interpretive methods in the hopes of always gaining a deeper grasp of the topic at hand. Instead of attempting to generalise from sample to population, qualitative research focuses on making sense of lived, observed phenomena in a specific context with specifically selected individuals (Johnson *et al.*, 2020). This study used qualitative research since it is important in educational research as it answers "how" and "why" research questions and allows for a deeper knowledge of experiences, phenomena, and context. Qualitative research also allowed the study to address questions about student experiences that are difficult to quantify. Using this methodology, the study was able to gain access to the participants' thoughts and feelings, which allowed researcher to better grasp the significance that participants of this study attribute to their experiences.

1.7.3 Research type

The objective of this study was to use a case study, which allows researchers to collect and analyse data in a specific context or occurrence (Aliyyah, Rachmadtullah, Samsudin, Syaodih, Nurtanto, and Tambunan, 2020). Mpungose (2021) argues that case study data is utilised to describe a case completely in real life. People, students, or staff members of a school community or institution can be chosen as cases (Aliyyah, Rachmadtullah, Samsudin et. al (2020). Collins and Stockton (2018) mentioned that one of the most adaptable qualitative research methods is the case study. Lawrence, Williams, Nanz, and Renn (2022) argue that a case study is a research method for gaining a comprehensive, multi-faceted understanding of a complicated subject in its real-world setting. Lawrence *et al.* (2020) further argue that a case study is a well-established research strategy that is widely employed across many fields. The selected case of this study was students who were registered in the field of health sciences at Wits at the time of the research. The researcher chose health sciences students as the case study because he worked with the majority of them as a Wits employee and they are among those who are currently studying online. Furthermore, some will continue with e-learning after the COVID-19 pandemic.

1.8 RESEARCH METHODS

Cr (2020) defines research methods as a technique for solving a research problem in a methodical manner. Cr (2020) further states that research methods enable the researcher to gather material and arrange it, participate in field work when necessary, and also in techniques for data collection appropriate to specific problems, such as the use of questionnaires and controlled experimentation, as well as in recording evidence, sorting it out, and interpreting it.

The below research methods (such as selection of participants, sampling, data collection, and data analysis) were used to acquire a better knowledge of health sciences students' perceptions on the effect of e-learning during COVID-19 pandemic at the University of Witwatersrand.

1.8.1 Selection of participants

The participants in this study were fourteen Wits Faculty of Health Sciences students who were enrolled in all seven schools of the faculty at the time of COVID-19, when the institution closed to implement e-learning in an effort to slow the spread of the pandemic. Despite the fact that there are no hard-and-fast rules about the number of participants needed for the study, some researchers think that, depending on the type of study and the research question, between 10 and 50 people are adequate (Opie, 2019). The researcher decided to include fourteen participants because he wanted to get thorough information and findings for the study and felt that his research would be complex for the participants to understand given that they were all first-time e-learning users. In addition, the researcher opted to involve more participants in order to obtain a clearer understanding and more in-depth information. The researcher obtained the contact information of the students from administrators of seven departments in the Faculty of Health Sciences; as a member of staff, he also had access to the participants' contact information to send questionnaires to the fourteen participants. The contact information of participants was obtained after receiving permission from the Ethics Committee of Health Sciences (Appendix H) and the University Deputy Registrar (Appendix I). The researcher distributed questionnaires to fourteen participants, three of whom were Nigerian, Zimbabwean, and Malawian international students, as well as eleven South African students studying in the Faculty of Health Sciences, Wits, in order to gain a clear understanding of the impact of e-learning on both local and international students. The researcher identified students from all seven schools in the Faculty of Health Sciences through administrators, and he had access to students' contact information as a member of the faculty's personnel. The administrators emailed their department's enrolled students, and the participants' answers were submitted directly to Google Forms, where only the researcher had access.

1.8.2 Sampling

The purpose of this research was to gather data that can be used to understand the complexity, depth, variation, or context of a phenomenon better. Purposive sampling was used because it allowed the researcher to choose people with in-depth knowledge and experience relating to the research topic. According to Farrugia (2019), in qualitative research, sampling can be thought of as a spiralling or cyclical process. Farrugia (2019)

argues that there are two types of sample selection procedures, namely conceptually driven approaches (purposive and theoretical sampling) and non-conceptually driven approaches (convenience and opportunistic sampling) with no specific emphasis or guiding principles in their sampling approach. Farrugia (2019) further argues that these sampling methods can be used to select participants in both complex and non-complex cases.

Purposive sampling was used in this study, which included fourteen students from the seven schools of the health sciences faculty who volunteered to participate in the study and who studied through online learning during the COVID-19 pandemic. In the first step, fourteen postgraduate students were chosen because of their willingness and proximity to the researcher. The researcher expected to conduct follow-up interviews with five participants in the second round, based on whether they had completed the online survey and were willing to participate in face-to-face interviews with the goal of getting clarity on what was answered by the participants; however, this never happened because the participants answered all of the researcher's questions in the questionnaire. According to Kersbergen, Creugers, Hollaar, et al. (2020) conducting follow-up questions with five students in qualitative research is a common and feasible approach. Follow-up questions with five participants enable researchers to delve further into participants' perspectives, delve into subtleties, and create rich qualitative data that can significantly advance the study (Köhler, Rummyantseva and Welch, 2023). This study focused on postgraduate students in Wits's Faculty of Health Sciences because the researcher believes these students can provide comprehensive information. These students have experience with both face-to-face and online learning, whereas undergraduate first year students may be unfamiliar with university online learning because they are attending university for the first time. Compared to undergraduate students, postgraduate students typically have greater technological proficiency. They most likely possess sophisticated knowledge of digital tools including learning management systems, web-based communication platforms, and multimedia materials. Also, some of the questions that the research wanted to address could not have been answered by undergraduate students because it required experience in both face-to-face and online learning.

1.8.3 Data collection

Mkandawire (2019) argues that it is hard to imagine research without indicating the presence of data collection methods and the data collected. Interviews, observations, artifacts, textual analysis, focus groups, applied ethnography, visual approaches, and document analysis are some of the methods used in qualitative research (Leko, Cook and Cook, 2021). As a feedback mechanism, this study used qualitative online questionnaire in a form of open-ended questions to get detailed information about the study. The researcher used online questionnaires since they are quicker and more affordable. Online questionnaires offer participants and researchers greater convenience, improved response rates, and accessibility from any device. They are also quick to analyse and simple to use.

The researcher sent a pilot test of his open-ended questionnaire to four students who were not part of the research, as a way of testing the questionnaires, to see if the questionnaire needed to be revised in terms of length and quality. This pre-test or pilot study of the open-ended questionnaire aided this study by allowing participants to provide comments as illustrated in Chapter 3 Section 3.5.1. The open-ended questionnaires were distributed to students through emails by the researcher. Furthermore, using a qualitative approach, the study was conducted with fourteen health sciences students at Wits, using one online questionnaire with sixteen mainly open-ended questions about the study. After the online questionnaires were completed, the analysis of the study based on the responses of the participants began. As a result, this study gathered information from a single instrument, an online questionnaire in the form of open-ended questions.

1.8.4 Data analysis

Qualitative analysis data can be analysed in a variety of ways, ranging from "descriptive" to highly interpretative and broad (Braun and Clarke 2021). The analysis and interpretation of data collected after the initial sampling influences sampling methods and sample size selections (Farrugia, 2019). Impact

Students studying health sciences provided the data for this study, which sought to better understand the effectiveness of e-learning and ascertain student attitudes toward it throughout the COVID-19 period, particularly among Wits students. As mentioned in the

research methods section, this study used an open-ended online questionnaire on Google Forms, which was sent to fourteen participants via email. To find, evaluate, and create a theme expressed by participants, data was evaluated utilising thematic analytics, as argued by Galloway and Jenkins (2005). Thematic analysis was employed in this study to better comprehend participants' answers and to produce insightful, contextually grounded interpretations (De La Cerda, 2019). Braun and Victoria (2006) define thematic analysis as the process of identifying patterns in data sets and providing rich interpretations of various aspects of the data set on the research question. In Chapter 3 Section 3.6 of this study, the procedures of the thematic analysis are detailed.

1.9 ETHICAL MEASURES

This study received approval from the ethics committee at the University of South Africa (UNISA) (Appendix G) and the University of the Witwatersrand's Health Sciences Ethics Committee (Appendix H) and Deputy University Registrar respectively (Appendix I). Prior to making contact with participants, and obtaining their consent, the researcher studied and understood UNISA and Wits ethics policy. As per Öñöral and Kurtulmus-Yilmaz (2020), all personal data (name, surname, student number, age, and country) was collected voluntarily from students. All participants were also informed about the objective of the survey and their option to withdraw at any moment in accordance with ethical considerations for qualitative research (Wa-Mbaleka, 2019). Participants were allowed to withdraw in the study at any point throughout the questionnaire. All that is expected of the participant is to notify the researcher and have their withdrawal of participation documented on the permission and data collecting forms. Ngozwana (2018) posits that, in qualitative research, the researcher must adhere to ethical issues such as removal from the study, anonymity, and confidentiality. According to Jacobs (2020) confidentiality and anonymity simply means that the environment and participants should remain anonymous in all reports. To maintain confidentiality, in the data collecting, data analysis, and publication of findings, no participants' names or identities were exposed. Permission was requested from the participants to save their completed online questionnaires on Google Forms before proceeding with answering the questionnaire, and everyone agreed. All information gathered was kept safe in a protected computer, with only the researcher having access to it.

The research provides a research plan of what will be discussed in Chapter 3 of this study in the form of a table.

1.10 RESEARCH PLAN OF ACTION

Table 1.10.1 describes the research plan of action, which is detailed in the third chapter of this study, dealing with research design and methods.

Table 1.10. 1: Research plan of action

Guiding research question	
WHAT ARE HEALTH SCIENCES STUDENTS' PERCEPTIONS OF THE EFFECT OF E-LEARNING DURING THE COVID-19 PANDEMIC AT THE UNIVERSITY OF THE WITWATERSRAND?	
Sub-research questions	
I. What influence did e-learning have on health sciences students at the University of Witwatersrand during COVID-19?	
II. Which available support/technologies for e-learning platforms were available to health sciences students?	
III. How did the measures taken by the University of the Witwatersrand to support health sciences students assist in implementing e-learning?	
IV. What e-learning possibilities did the University of the Witwatersrand's health sciences students have during COVID-19?	
Paradigmatic suppositions	
Epistemological Model	Constructivist
Methodological Model	Qualitative
Theoretical framework – Connectivism and social constructivism	
Selection of participants – purposive sampling	
14 participants	Selection criteria:

	The participants in this study were fourteen students enrolled in seven different schools in the Faculty of Health Sciences at Wits in 2020 to 2022 during COVID-19
Data collection	
Data collection instrument	The open-ended online questionnaire was utilised to gather information on Google forms from fourteen participants who were enrolled students in the Wits Health Sciences program.
Qualitative	The qualitative approach provided an explanation for the how and why of the research questions and enabled a deeper comprehension of experiences, phenomena, and context.
Analysis and interpretation of data	
Qualitative data analysis	Thematic analysis
Quality assurance measures	
Data trustworthiness – for the qualitative aspect	
Measures to enhance credibility	The researcher sought confirmation from participants that he had appropriately described their narratives and obtained additional feedback in this study (Member check).
Measures to enhance transferability	Describing the research context and the assumptions that were central to the research
Measures to enhance dependability	The researcher saved the questionnaire on Google Forms and then analysed the data.
Measures to enhance confirmability	Audit trail
Ethical considerations	
Ethical considerations adhered to	This study received approval from the ethics committee at the University of South Africa (UNISA) as well as the University of the Witwatersrand's, Deputy Faculty Registrar respectively. No participants' names or

identities were exposed. All information gathered was kept safe in a protected computer, with only the researcher having access to it

1.11 TRUSTWORTHINESS OF THE STUDY

Aliyyah *et al.* (2020) define trustworthiness as the reader's ability to determine whether the researchers were honest in their study methods and reasonable in their conclusions. Daniel (2019) argues that, in qualitative research methods, trustworthiness is a crucial issue. Vesey (2020) argue that the idea of trustworthiness depicts the quality of qualitative research and underpins both rigor in the research process and relevance as well as confidence in the study conclusion in addition to the degree of trust or confidence that readers have in study findings is revealed by trustworthiness in qualitative research. Lastly, on this basis, trust can be considered as an essential component for improving research findings comprehension and interpretation. This study exercised extreme caution when pushing for the same levels of transparency and replicability found in quantitative research in a qualitative setting. This study covered transferability, credibility, dependability, and confirmability (Lincoln and Guba, 1985) as aspects of trustworthiness, which are discussed in detail in Chapter 3 Section 3.7.

1.12 CLARIFICATION OF CONCEPTS

There are some phrases that are used frequently in this study that are defined so that they are understood throughout the investigation.

E-learning: e-learning is a type of learning that is based on formalised instruction but uses electronic resources. While teaching can take place in or out of the classroom, e-learning relies heavily on computers and the Internet. It is a learning approach that combines formalised instruction with the use of technological resources. According to the OECD, e-learning is the use of information and communication technology to promote or support learning in higher education (2005). The e-learning platform provides a structured learning method that makes use of electronic resources (Maatuk *et al.*, 2022).

Faculty of Health Sciences: the Faculty of Health Sciences at the University of the Witwatersrand, located in Johannesburg, South Africa's economic hub, provides students with real-world training that prepares them for a career in the global healthcare sector. The faculty is divided into seven schools: Anatomical Sciences, Clinical Medicine, Oral Health Sciences, Pathology, Physiology, Public Health, and Therapeutic Sciences.

COVID-19: COVID-19 is the Coronavirus, which causes acute respiratory infection in humans that can cause severe symptoms and, in some cases, death, particularly in the elderly and those with pre-existing medical conditions (Islam, Ahmed, Naqvi, and Parveen, 2020). It was first discovered in China in 2019 and was declared a pandemic in 2020.

Ulwazi: Ulwazi is the Wits Learning Management System (LMS). It uses the Canvas online platform to support teaching and learning, Canvas is a modern, powerful LMS used by thousands of universities around the world (Badaru and Adu, 2022). It is hosted in the Cloud so it can be accessed by many users simultaneously.

Wits Sakai: Wits Sakai is a LMS for Wits students. Sakai serves as the foundation for the e-learning platform. Sakai is an open-source collaboration and learning environment in use at 200 universities worldwide, with over a million users who use it daily in their teaching and learning (Mhlanga, 2021).

eFundanathi: eFundanathi, which means “Learn with Us”, is the e-learning portal for the School of Therapeutic Sciences, which is part of the Faculty of Health Sciences (Olivier, Jacobs, Naidoo et al. 2021). This platform assists students with interactive, flexible, blended learning methods that shape their way to inspire students to learn.

Emerging technologies: an emerging technology is one that is not currently used in education but has the potential to be more widely adopted to support improvements in learning and teaching. The goal of emerging technologies is to enable more creative and engaging teaching and learning methods and experiences (Oliveira, Feyzi Behnagh, Mohsinah et al 2019).

Microsoft Teams: Microsoft Teams is a digital hub that consolidates conversations, content, and apps into a single location. It is a platform that allows teachers to create collaborative

classrooms, connect in professional learning communities, and communicate with school personnel (Kokkonos and Korres, 2021).

Zoom: Zoom is a video conferencing tool that allows instructors and students to meet online synchronously via a personal PC/laptop or cell phone, with or without video (Basilaiia and Kvavadze 2020). Instructors can schedule Zoom meetings to conduct classes online and record them for students to access later.

1.13 DIVISION OF CHAPTERS

The study is comprised of five chapters:

Chapter 1: this introductory chapter provides a general outline of the research, including the research topic, research questions, and research objectives. Other components of the study that are discussed are research technique and design, explanation of concepts, and chapter division. Trustworthiness and ethical considerations are also briefly discussed.

Chapter 2: the researcher examined the literature and discussed related topics like online learning becoming increasingly common in the 21st century. The theoretical framework's concepts are discussed in the chapter's second half. To describe how learning occurs in online learning, the selection of the theoretical frameworks used, such as Connectivism, and Constructivism, will be discussed.

Chapter 3: the research methodology is discussed in this chapter. It describes both the qualitative research approach and the case study research design. The chapter also discusses the research methodologies used in this study, which include participant sampling, data collection and processing (online survey) as well as features such as practical study phases and analysis. It will continue by examining the study's trustworthiness and ethical measures.

Chapter 4: the findings of the practical research are presented in this study. Chapter 4 presents information gathered from the online questionnaire. The personal profiles of the participants are presented first, followed by the themes and sub-themes that emerged from

the data acquired from the online questionnaire. This chapter's structure focuses on data analysis.

Chapter 5: this chapter determines whether the research objectives were met. It starts with a summary of the literature review and empirical investigation. The research findings are then synthesised to illustrate any similarities and inconsistencies between the literature review and empirical investigation. This chapter also examines the research's findings and makes recommendations for Wits's e-learning development. The chapter concludes with recommendations for additional investigation.

1.14 CONCLUSION

From the information presented above, this chapter detailed the issue statement for a topic to determine health sciences students' perceptions on the effect of e-learning during the COVID-19 pandemic at the University of the Witwatersrand. It also included a description of the problem, research questions, and research objectives. The study's research topic, questions, and methodology, as well as the study's reliability and ethical considerations, were all discussed. This chapter provided a thorough explanation of some often-used topics. The research supplied a plan of action in the form of a chapter summary. Finally, concepts used in the study were explained in further detail. In the following chapter, the researcher discusses the theories underpinning the study as well as relevant literature.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 INTRODUCTION

The previous chapter introduced the study by describing the study's introduction, background, research problem, primary question, and sub questions, as well as providing a brief description of the research methods.

Against the above background, this chapter looks at an integrated theoretical framework and literature review. Consequently, the purpose of this chapter is to review literature, learning theories, and Open and Distance Learning (ODL) theories that explain health sciences students' views of the effect of e-learning during the COVID-19 pandemic at Wits. This chapter also discuss educational policies that are crucial to this study because they help to determine theory and practice. The current gaps in the field are discovered, ensuring that grounding of the phenomenon under inquiry was relevant, important, and beneficial. The following theories serve as the foundation for this research and are discussed next: Connectivism and Social Constructivism.

2.2 THEORETICAL FRAMEWORK

According to Kivunja (2018), a theoretical framework is the structure that holds or supports a theory by introducing and describing it in relation to the research problem. Kivunja (2018) further posits that a theoretical framework demonstrates an understanding of theories and concepts pertinent to the research topic.

As stated in Chapter 1 Section 1.6 of this study, the theories of connectivism and social constructivism are two important learning theories of the 21st century and also underpin this study. Dacholfany, Saifi and Sulaiman (2022) posit that the learning theories of constructivism and connectivism both offer insightful explanations of how students learn and acquire knowledge.

The constructivism and connectivism theories have recently been applied in a variety of research investigations. A connectivist Massive Open Online Course (MOOC) was examined by Zhang and Fulford (2020) to see how well it promoted self-regulated learning. In the

context of a connectivist learning environment, the study looked at how learners interacted with online resources, their social interaction habits, and how they built knowledge. Furthermore, in a study by Papadopoulos and Demetriadis (2019), constructivism was used to examine how a blended learning environment affected students' ability to think critically and solve problems. A constructivist teaching approach was developed and put into use by the researchers, with a focus on student-centered learning and group problem-solving exercises (Müller and Wulf, 2021).

Connectivism arose as a result of technological advancements, particularly in the means of swiftly and extensively disseminating information over the Internet (Boyras and Ocak, 2021). The need of creating a collaborative environment for students to interact and participate in a social context is emphasised in the social constructivism theory (Siemens, 2005). With all said, the following sections elaborate on the two theories.

2.2.1 Connectivism

Hendricks (2019) mentions that the theorists George Siemens and Stephen Downes introduced connectivism in 2005 for people to comprehend learning in the digital age. Connectivism theory describes a learning environment in which students simply connect to the network and design their own learning (Hendricks, 2019). Siemens' connectivism theory represents a paradigm shift from traditional learning theories to new ways of learning via networks, databases, and web learning on various virtual learning platforms (Hendricks, 2019).

The connectivist theory was chosen as the most appropriate theory for this study since it provides a beneficial framework for understanding perceptions on the effect of e-learning at Wits during the COVID-19 pandemic. The connectivist learning theory not only views students as assets with the ability to direct their own learning (Downes, 2008; Siemens, 2005) but is also more adaptable to recent technological advancements (Downes, 2008). Furthermore, it is advantageous because it is derived from post-sociocultural and post-traditional learning theories and is focused on networks to navigate a wide range of possible knowledge (Bell, 2011; Glassner and Back, 2020). Connectivism emphasises how internet technologies have expanded people's opportunities to study and share information, as argued by (Siemens and Downes, 2015). As a result, before the COVID-19 pandemic, Wits

used F2F learning to generate new opportunities and share information. However, technology has made it easier for students to share information and interact as peers, with the lecturer serving as a facilitator during the COVID-19 pandemic. Connectivism stresses how internet technologies contribute to new learning; as a result, this theory aided the study in addressing or identifying tools available to support/technology e-learning platforms.

2.2.2 Social constructivism

According to Clark (2018), social constructivism is a social learning theory developed by Russian psychologist Lev Vygotsky. Shah (2019) posits that constructivism has been a powerful model for explaining both how knowledge is produced in the world and how students learn. The constructivist theory, according to Shah (2019), holds that knowledge is constructed by students as they try to make sense of their experiences. The social constructivist theory was selected for this research as it allows students to evaluate and encode knowledge based on their own experiences and perspectives. Furthermore, this theory was chosen because it empowers students to discover, construct, practice, and validate acquired knowledge in social collaboration with their peers and teachers by shifting the information transfer from teaching to learning. According to Vygotsky (1978), the constructivist theory allows knowledge to be built in social environments, internally assessed, and then used to build new information once the knowledge makes sense. In this theory, the instructor and the student build a relationship in which each learns what motivates the other, monitoring and adapting as needed. Consequently, the instructor learns how to teach successfully in an e-learning environment, while the student learns how to successfully learn in an e-learning environment. Students were able to gather new knowledge on their own throughout COVID-19 and utilised it to complete their assignments, projects, exams, and tests, according to the researcher of this study, who is a member of the Faculty of Health Sciences at Wits.

The two theories complement each other because the first, connectivist theory, draws the concept of spaces in which learning occurs in digital environments and emphasises how internet technologies contribute to new learning, whereas the second, constructivist theory, makes connections with students' experiences and prior knowledge. Additionally, connectivism and constructivism are complementary theories that each have their strength. As a result, in the context of technology-mediated learning, they can complement one another

in a variety of ways (Diwakar, Achuthan and Nair, 2020). Students can take advantage of connectivism's emphasis on connectedness and networked resources while utilising constructivism's learner-centered and active learning methodologies (Diwakar, Achuthan and Nair, 2020). Connectivism offers a framework for comprehending how learners can navigate and use these networks in the modern digital world, where information is easily accessible through a variety of online platforms (Tham, Duin, Veeramoothoo et al. 2021). Dempsey, Richardson, Cope et al. (2021) argue that the constructivism theory prioritises the learner and acknowledges the value of prior knowledge, life experiences, and individual interpretations. In addition, constructivism philosophy promotes active participation, self-directed learning, and the creation of meaning based on individual experiences.

Although constructivism and connectivism offer insightful perspectives on learning, they also have certain limitations when used in e-learning environments, despite the strengths highlighted above. Weis (2021) argues that the relevance of connections and networks in learning is heavily emphasised by connectivism theory. On the other hand, not all students in e-learning environments might have the same access to dependable networks or the same level of proficiency with intricate digital networks Weis, (2021). Weis (2021) further argues that the use of connectivist principles may be hampered by the discrepancies in learning opportunities that result from this. Wu, Hsieh and Wu (2022) mention that constructivism has the potential to lead to social isolation and a lack of engagement because it emphasises the value of collaboration and social interaction in learning. However, in some e-learning settings, students could feel alone and have little opportunities for deep social engagement (Wu, Hsieh and Wu, 2022). The depth of learning experiences may be impacted by the fact that online discussions and collaborative activities may not always mirror the richness of in-person interactions (Wu, Hsieh and Wu, 2022).

During the COVID-19 epidemic, online learning became more prevalent, and connectivism and constructivism theories support this trend. Weis (2021) argues that connectivism recognises the importance of networks and technology in education, which is particularly relevant in the context of distance learning and online learning, supporting what has been said above about these two theories being more prevalent at the time of COVID-19. The research of Weis (2021) also argues that constructivism places a strong emphasis on experiential and hands-on learning, which can be supported in e-learning settings by several digital tools and platforms. Moreover, by using these theories, the researcher was able to

obtain information from participants in the digital age as well as students' experiences with online learning and teaching.

Saad, Hagelaar, van der Velde, G. et al. (2021) argue that researchers can establish the theoretical underpinnings of their study while taking into account the practical ramifications of their research in the policy context by combining the literature review and policy context in one chapter. This integrated chapter gives a thorough overview of the body of research, identifies knowledge gaps in the theoretical and policy fields, and establishes the framework for the research design and analysis. Therefore, the sections that follow elaborate on educational policy and practice in order to establish theory and practice.

2.3 EDUCATIONAL POLICY AND PRACTICE

Policy and practice aid in the effective transfer of knowledge as well as the appropriate influence of policy and practice (Dale, Sporne, Knight, Sheaves, Eslami-Andergoli, and Dwyer, 2019). However, due to differences in knowledge and communication, experiences, and skills, policy or practice focusing on the goal may obfuscate the science (Knight, et, al.2019). A policy, according to Musau, Wanyama, and Mbae (2014), is an explicit or implicit single decision or combination of decisions that establishes instructions for future decisions, initiates or delays action, or leads the implementation of past decisions. Ferguson, McKenzie, Dalton, and Lyner-Cleophas (2019) posit that incorporating good practices begins with recognising what is good for most people and establishing good policy frameworks. According to Mzangwa (2019) policies are developed and implemented primarily to benefit society, specifically to address inequalities in a disadvantaged group in order to prevent further discrimination. Mzangwa (2019) mentions that since South Africa's democratic transition in 1994, the democratic government has attempted to reconsider and revise higher education policy; however, these policy changes have not resulted in material benefits for the majority of previously disadvantaged non-white people in South African society in terms of access, equity, and participation in higher education. Mzangwa (2019) argues that this is due to various factors, including poor policy implementation and a lack of monitoring of compliance with current policies, resulting in a decided lack of success in redressing and transforming the higher education system. The debate is ongoing, and the government's task is to determine how the system should be restructured to accommodate previously disadvantaged students, a task that has yet to be completed, as evidenced by the failure of

policies like the Department of Education's Draft Green Paper (Department of Higher Education and Training [DHET], 2012)

2.3.1 Policies guiding e-learning in higher education

The two most important educational policies pertinent to this study are the 2014 Department of Higher Education's (DHET) Distance Education policy and the 2020 University of the Witwatersrand's Online Learning and Teaching policy, which are explained in full below.

2.3.1.1 2014 Department of Higher Education and Training Distance Education policy

The policy focuses primarily on university education. Because the current infrastructure in the South African university sector cannot accommodate the required expansion, distance education would make a significant contribution to the sector's required growth (DHET, 2014). While the DHET recognises the growing impact of Information Communication Technology (ICT) on distance education provision, it is concerned that the increasing use of terms such as "blended", "flexible", and "mixed" provision cover an overly broad range of possibilities, and that in using such terms, the unique opportunities and challenges of distance education provision are frequently overlooked (DHET, 2014). The DHET (2014) posits that, with the increasing use of ICT, the continuum has been refined and is now more usefully depicted as a two-dimensional figure that illustrates the increasing variation possible in designing learning programs. The DHET recognises that there is now a growing convergence in the ways that traditionally F2F and traditionally distance education institutions offer their programmes, owing largely to the increased use of ICT (DHET, 2014). The DHET (2014) argues to maintain a focus on distance education provision as a distinct subset of provision due to the potential of distance provision to: 1. Open access to post-schooling education opportunities for those who cannot or do not wish to attend traditional campus-based provision; and 2. Lower costs per student by amortising curriculum design, materials development, and some teaching costs across a larger number of students and avoiding the need for ongoing investment in physical infrastructure.

The DHET (2014) maintains that the policy's requirements assume that students will rarely, if ever, be in the same physical location as their lecturer at the same time. This policy relates

to e-learning because it is more inexpensive, accessible, and reachable for students regardless of their location or financial status. The Academic Administration Online Learning and Teaching flows from this as all higher education institutions must adhere to DHET policies and align their policies accordingly. As a result, the Wits policy on online learning and teaching is discussed in detail below.

2.3.1.2 Wits's Academic Administration Online Learning and Teaching policy

According to Wits (2020), the Online Learning and Teaching policy strives to facilitate the provision of Online Learning opportunities to enhance access and enable the successful delivery of both mixed mode and distance learning. Wits (2020) posits that, with the development of new technologies and pedagogies, the University should be flexible to ensure the quality and integrity of the courses and programmes as well as articulation between credit-bearing and non-credit-bearing courses. Wits (2020) mentions that the University is committed to increasing access to learning programmes for more people and putting measures in place to help them succeed. This will necessitate the development of in-house capability to produce appropriate quality learning materials (digital assets) over time, while leveraging the best external resources to accelerate the transformation (Wits, 2020). The University is committed to training employees to provide excellent services for online programme/course development (Wits, 2020). The provision of online programmes must be economically viable for each course and programme (Wits, 2020). The DHET still regards remote education as a unique subset of offering, notwithstanding the increasing convergence and blurring of the boundaries between traditional contact and online/distance education (Wits, 2020). The University's Learning and Teaching Plan is supported by the Online Learning and Teaching policy, which aims to make online learning more accessible and enable the successful implementation of both mixed mode and distant learning (Wits, 2020). The provision of online learning opportunities depends on the availability of appropriate technologies to provide a sustainable and reliable platform for effective learning and teaching to take place (Wits, 2020). The delivery of online courses and programmes necessitates a pragmatic approach in terms of multiple start dates per year, fully online assessment that may necessitate proctoring and/or proctoring software, a suitable LMS, and in-house or contracted creation of digital assets, online access to library collections, online data management for students, and student development and support (Wits, 2020). The

assessment of online courses and programmes will be similar/equivalent to that of contact programmes, with the parity of standards being paramount.

Wits (2020) posits that the assessments will be genuine, ensuring that the academic outcomes of a programme/course are met. Wits (2020) argues further that the assessment of online courses and programmes will follow the University's standing orders on assessment, which will be pragmatically applied to each course/online programme's mode of delivery. Wits (2020) argues that this online policy addresses student support, which includes guidance on the use of technology for learning and teaching as well as assistance when they encounter problems with the online delivery system. Wits (2020) mentions that this support improves study skills and emotional stability, assistance, and support to set up communication channels and study groups online, peer support, and access to library materials, among other things.

This Wits online teaching and learning policy, which is based on the material above, encourages best practices and establishes uniformity in teaching and learning throughout the entire university. The policy must be followed by every academic department at the university that is in charge of teaching and learning when it uses online teaching and learning. It seeks to guarantee that all students receive excellent educational opportunities, resulting in a continuously high level of academic accomplishment and attitude. Some of the policy's contribution will be summarised in Chapter 5 section 5.4 regarding the research findings, discrepancies, and similarities between this policy, the literature review, and the empirical findings reported in Chapter 4.

The next sections elaborate on the benefits and limitations of e-learning.

2.4 BENEFITS OF E-LEARNING

If properly structured, e-learning could be more effective than traditional F2F learning (Sarker, Al Mahmud, Islam, and Islam, 2019). E-learning is simple to use, saves time, and is inexpensive (Maatuk *et al.*, 2022). Because of the widespread availability and accessibility of electronic devices such as smartphones, tablets, and computers, it is now possible to teach and learn outside of traditional classroom settings (Sarker *et al.*, 2019). Maphalala and Adigun (2021) argue that course content and knowledge sharing among individuals or groups

of learners and their instructors is made possible through e-learning. Instructors, regardless of their geographical location or distance from one another, e-learning has the potential to reduce educational inequalities and create a more inclusive learning environment (Maphalala and Adigun, 2021). Turnbull, Chugh and Luck (2021) states that, as e-learning information systems have grown in popularity, higher education institutions can now capture a wide range of student activities and interactions, from low-level events like mouse gestures and clicks to higher-level events like students' learning patterns and processes. In South Africa, e-learning continues to be an important tool for facilitating self-directed and self-regulated virtual learning engagements (Maphalala and Adigun, 2021). According to the principle of self-directed learning, students like to be in control of their own education (Gharti, 2019). Teachers assist their students in developing their own learning strategies and taking control of their education by utilising a self-directed learning technique (Gharti, 2019). By include open-ended, challenging questions in their lesson plans, teachers can aid students in becoming more self-directed learners (Gharti, 2019).

Hume (2021) argues that good self-regulation abilities include effective time management, the ability to quickly identify the most effective problem-solving techniques, and the capacity to actively monitor emotional states like frustration. Self-regulation also helps to reinforce the learning topic while fostering personal accountability for one's education (Hume, 2021). Self-control exercises enhance the retention of information and abilities, particularly in writing and reading comprehension (Hume, 2021).

E-learning increases students' motivation and active participation in the learning process (Adigun, 2020; Millham *et al.*, 2014). Maphalala and Adigun (2021) mention that e-learning, among other things, increases access to education through flexible and cost-effective methods. According to Penberthy (2020), e-learning has conveyed new opportunities to education; in so doing, it also introduced many experiments for the students, who have to decide what, when, how, and or how long to learn. Connectivist theory defines learning spaces in digital environments and emphasises how internet technologies contribute to new learning; the use of digital environments clearly defines who has the authority to decide what, when, how, and how long to learn, which can only be done properly in this digital age with the use of digital environments (Corbett and Spinello, 2020).

Despite the affordances or benefits of e-learning, institutions, students, and the broader society face some limitations, which are discussed below.

2.5 LIMITATIONS OF E-LEARNING

Maatuk *et al.* (2022) argues that, despite the benefits of e-learning, one of the barriers to its implementation in Libya is the deterioration of the Internet infrastructure that supports this education system in general. The main disadvantage of using e-learning is the lack of critical personal interactions, not only between students and lecturers, but also among peers (Maatuk *et al.* 2022). The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. Aboagye, Yawson and Appiah *et al.* (2021) argues that many challenges confront developing countries when implementing e-learning, including poor Internet connectivity, insufficient knowledge of information and communication technology, and inadequate content development. Many educators, even at the higher education level in developing countries, are still unfamiliar with the use of content such as video and advanced applications (Abdulaziz and Baqer 2023). Namyssova, Tussupbekova, Helmer, Malone, Mir, and Jonbekova (2019) argues that a lack of appropriate infrastructure and access to technology may impose some limitations on the successful integration of e-learning. In practice, this study indicates that, without a proper infrastructure, implementing e-learning in educational institutions will be difficult. As a result, educational institutions must have libraries, classrooms, and laboratories equipped with e-learning equipment such as audiovisual, computers, and projectors, and instructors must be trained in the use of these resources in order to assist students in using e-learning. Legg-Jack (2022) mention that some of the difficulties that e-learning students face include:

- Lack of Internet access,
- Lack of Internet data bundles,
- Poor Internet connectivity,
- Preference for F2F learning,
- Lack of practical activities in e-learning,
- Lack of ICT learning infrastructure,
- Difficulties with time management and
- Self-discipline, and a lack of a conducive learning environment.

Namyssova *et al.* (2019) investigated academic staff perceptions of blended learning in South Africa to identify challenges encountered. It was determined that the lack of a blended learning policy, inadequate staff training, and limited student access to computer laboratories were challenges to the success of e-learning, especially blended learning. With the benefits and limitations that students had and faced while using e-learning during COVID-19, there were some factors that motivated students to use e-learning and helped them finish their academic years; these are discussed in detail below.

2.5 E-LEARNING DURING COVID-19 AND STUDENT MOTIVATION

Shifting education to e-learning suddenly due to the outbreak of COVID-19 has been a challenge for most South African higher institutions, including the Wits community, which was not familiar with e-learning before the outbreak of COVID-19 (Mhlanga, Denhere and Moloji, 2022). Deas (2021) argues that keeping students focused on their studies amid a crisis like as COVID-19 has become a new and difficult problem for instructors, students, and parents. Rahm, Töllner, Hubert, Klein, Wehling, Sauer, Hennemann, Hein, Kender, Günther, and Wagenlechner (2021) argues that, during the COVID-19 pandemic, students encountered social isolation, practical training cancellations, and a general lack of enthusiasm. Therefore, in the current setting, it is even more crucial to comprehend and stabilise motivational elements for students in e-learning environments (Rahm *et al.*, 2021).

Turner (2020) discovered that a lack of student motivation had a psychological effect on students. Morrison (2020) suggests that, to keep students motivated in an e-learning setting, they need receive constant feedback and encouragement, which has been found to be more beneficial than pressuring them to improve their grades or be the top in the class. Alshehri, Mordhah, Alsibiani, Alsobhi, and Alnazzawi (2020) agree with the preceding scholar that frequent feedback from instructors helps students analyse their work and identify potential areas for advancement.

Pallavi, Ramachandran, and Chinnasamy (2022) assert that, with e-learning, some students are extremely motivated to learn and value learning at their own pace. According to Chung, Noor, and Mathew (2020), motivated students perform better, are more persistent, and are more creative. Chung *et al.*, (2020) further argue that motivated students are also more likely

to engage in demanding tasks and be actively involved in their learning. Research done by Sarikhani, Salari, and Mansouri (2016) on the impact of e-learning on university students and found that e-learning had a favourable impact on students' academic accomplishments. Sarikhani *et al.* (2016) further argue that e-learning increases students' attitudes, motivation, and academic accomplishment as it does at some institutions. As a Wits employee, the researcher has seen how e-learning has aided academics in reaching out to more students by uploading class notes to a student site and providing courses via Zoom and Microsoft teams during the COVID-19 crisis. Yastibas and Yastibas (2015) found that the use of e-learning in structured teaching-learning process improves students' learning and creativity. According to the above-mentioned studies, the data shows that e-learning can have a philosophical and positive effect on students' involvement, personalised learning, and student creativity. The researcher stated that e-learning aided Wits students' academic achievement, particularly those who could not live on campus. Students no longer had to worry about transportation or food because they could attend classes from the comfort of their own homes. Jawad and Shalash (2020) support the researcher's claim that e-learning assisted Wits students in achieving academic success and being able to attend classes from the comfort of their own homes by stating that e-learning promotes self-learning and provides a sense of comfort in use and interaction, allowing for greater flexibility in learning time while also motivating students and improving academic performance.

This study explained each type of e-learning in detail and indicated the exact type of e-learning used by Wits when the University had to shift its mode of learning to online due to the pandemic in 2020. This study covered the several e-learning formats to emphasise the gaps and areas where the study adds new knowledge. In addition, the categories of e-learning were discussed in this study's literature review because they provide a conceptual context for organising and categorizing the body of earlier research on e-learning.

2.6 TYPES OF E-LEARNING

Sarikhani *et al.* (2016) posits that there are six types of e-learning:

i) e-learning with physical presence but no electronic communication (F2F): physical presence during e-learning but no technological communication refers to a kind of instruction where students and teachers are physically present in the same space, such a classroom or

training facility, but where electronic communication tools, like internet-based tools or gadgets, are not used for educational reasons. Traditional face-to-face teaching and learning techniques are used in this situation.

ii) e-learning without presence and without e-communication (self-learning): without the use of electronic communication technologies or physical presence in a traditional classroom environment, e-learning without presence and without presence is a self-learning technique in which students complete educational tasks on their own. Self-motivation and independent thought are key components of this self-paced or self-directed e-learning approach.

iii) e-learning without presence and with e-communication (asynchronous): a form of online learning called e-learning without presence and with e-communication allows students to participate in educational activities without being physically present in a typical classroom. Instead, asynchronous communication between students and teachers is conducted through the use of technology.

iv) e-learning with virtual presence and with e-communication (synchronous); when students and teachers communicate in real-time online using electronic communication technologies, a synchronous learning environment is created. This type of online learning is referred to as e-learning with virtual presence and e-communication.

v) e-learning with occasional presence and with e-communication (blended/hybrid asynchronous): e-learning with intermittent presence and electronic communication is a blended or hybrid learning strategy that mixes online asynchronous learning with intermittent in-person encounters and electronic communication. This research concentrated on the fifth type of e-learning strategy, which is asynchronous blended/hybrid learning. In this form of learning, there is an alternation between F2F education in a classroom and asynchronous online teaching, where students do coursework on their own in accordance with specified deadlines. Wits used asynchronous blended/hybrid learning in the health sciences faculty because the students had contact classes or F2F learning with a mix of e-learning.

vi) e-learning with presence and with e-communication (blended/hybrid-synchronous): e-learning with presence and e-communication, sometimes referred to as blended or hybrid synchronous e-learning, mixes face-to-face classroom activities with in-the-moment electronic communication technologies to promote interactive and collaborative learning experiences.

The types of e-learning listed above, such as e-learning with occasional presence and e-communication (blended/hybrid synchronous), according to the researcher, play a crucial role

in enabling students to explore technology and employ new tools or strategies for learning. Academic institutions benefit from synchronous online learning because it allows them to reach out to people all over the world with high-quality education while also increasing immediate personal interaction between students, peers, and instructors. This category of e-learning outlined by Sarikhani *et al.* (2016), students benefit from e-learning because it allows them to learn at their own pace and focus on areas that they are enthusiastic about, as the researcher of this study can attest having studied his Master of Education degree online (self-learning). Muir, Wang and Douglas *et. al* (2022) argue that genuine e-learning is inspired by quick reaction, time on task, active learning approaches, communication of high expectations, and respect for diversity and ways of wisdom from each student. According to Kljajic-Borstnar, Kljajic, Skraba *et al.* (2011), individual data response contributes to individual learning. Students must be clear about what they will gain through e-learning and how this knowledge can be applied in practice.

The section that follows below discusses e-learning management and the e-learning support institutions provide to students.

2.7 MANAGEMENT OF E-LEARNING AND STUDENT SUPPORT SERVICES

Owolabi (2020) argues that an e-learning environment is unique in that there is no contact between the instructor and the students as well as between the students and the school support systems. Owolabi (2020) also mentions that many students who require support systems on a regular basis are troubled students, and a lack of quality support can exacerbate their perception of the quality of services and education they receive. In addition to the skills required to provide this service, the school support system's online presence, as well as demonstrated empathy and quality engagement, are critical in meeting the needs of students, (Owolabi, 2020). Després-Bedward, Avery, and Phirangee (2018) posit that student support services contribute to the quality of students' learning experiences and academic success as well as a reduction in university dropout rates while increasing students' life diversity by encouraging and making students feel a sense of belonging by alleviating feelings of separation and isolation.

Sonn, Du Plessis, Jansen Van Vuuren, Marais, Wagener, and Roman (2021) posit that not all university students and employees had laptops or personal computers, nor did they all

have home Internet access from the start of COVID-19. Önöral and Kurtulmus-Yilmaz (2020) argue that students need access to a computer and the Internet and the ambition to achieve in a non-traditional classroom to engage in an online course. Having cited the above scholars, the Wits provided needy students with resources like data provision, creating zero-rated sites, and laptops during the hard lockdown of COVID-19. Sonn *et al.* (2021) support Wits's implementation in assisting needy students while using online learning by acknowledging that students in need received devices and laptop computers as part of the transition to online teaching and e-learning. Sonn *et al.* (2021) further argue that this was done strategically to ensure a fair and just distribution to all students. As a result, collaborations with data service providers were formed to provide zero-rated data rates to all students (Sonn *et al.*, 2021). Wits's online policy backs up the statement by recognising that support in online learning, such as providing zero-rated dates to students, improves study skills and emotional stability (Wits, 2020). Wits (2020) goes on to argue that online support can also help with setting up communication channels and study groups online, peer support, and access to library materials.

Owolabi (2020) posits that e-learning should be adequately supported by technology. Owolabi (2020) further argues that it is preferable to consider how technology can enable effective integration of the LMS, resources, communication, and social forums. Governments and education providers should consider equipping instructors and students with standardized home-based teaching and learning equipment, conduct online teacher training, and support academic research into online education, particularly education to assist students with online learning difficulties (Huang, Liu, Tlili, *et al.*, 2020). According to Ali (2020), to make studying meaningful and satisfying for all students, instructors and administrators need suitable ICT infrastructure and student support services. Ali (2020) further mentions that lecturers and teaching staff in general are critical stakeholders in the effective implementation of e-learning, and they must be respected and supported appropriately. Agormedah, Henaku, Ayite, and Ansah (2020) posit that to foster an atmosphere of empathy and care, higher education institutions should upskill their employees to deliver this type of high-quality online education and provide effective emotional presence.

For institutions to upskill their employees, they require financing to offer adequate resources and to train instructors or staff so that they can provide high-quality services. Having employees who are properly trained in the use of new technology will allow institutions to run

more efficiently, and as a result, funding will help cover training costs. Technology, as part of the institution's infrastructure, helps to reduce the obstacles to education imposed by space and time and thoroughly expand access to lifelong learning; for that reason, students no longer have to meet in the same place at the same time to learn together from an instructor. Employees also reported a lack of sufficient data in the use of e-learning and suitable technologies to support their teaching (Qwabe and Khumalo, 2020). To address these data challenges, Wits provided assistance to students by providing data, creating zero-rated sites, and providing laptops, and as a member of staff at Wits University, the researcher has seen an improvement since the outbreak of COVID-19, with most educational institutions continuing to do the same as Wits.

In the event of a pandemic, online learning is an option, (Irfan, Kusumaningrum, Yulia, and Widodo, 2020). Because it may be utilised anywhere and at any time, e-learning is extremely convenient; however, implementing online learning might not solve all the problems (Qwabe and Khumalo 2020). As a result, higher education institutions with no experience with e-learning or resources face challenges, particularly when instructors are unfamiliar with how to use online programmes (Kim and Bonk, 2006; Zaharah and Kirilova, 2020). Irfan *et al.* (2020) further mention that several online-based learning strategies were implemented by Indonesian institutions during the COVID-19 pandemic, and this was a quick response by Indonesian universities to reduce COVID-19 transmission on campus. Agormedah *et al.* (2020) mention that the majority of university students are new to e-learning, making the transition difficult, particularly in terms of time management and the need for extra time to acclimate to remote education.

Online learning requires a variety of student traits, including technological expertise, time management and organisation, and online technology engagement (Joosten and Cusatis, 2020). Yunos (2010) further posits that the quality of e-learning systems has received a lot of research attention, and many researchers have tried to identify e-learning success factors to exploit the effectiveness of e-learning. According to Al-Fraihat, Joy, and Sinclair (2020), most of this research has focused on individual components of essential e-learning system success factors, ignoring the synergistic impact of the success variables working together. Although membership of their discipline constitutes an important influence on academic identities, so does the interaction with students that currently takes place predominately within the classroom (Hanson, 2009). According to Hanson (2009), e-learning challenges

academics' perceptions of learning and teaching, such as their role identity and self-efficacy, since education is more than simply putting lecture notes online.

Based on the above e-learning studies, the researcher concludes that there is a gap in the research on e-learning in South African residential (F2F) institutions. Mpanza (2022) argues that most universities were unprepared for the abrupt shift to remote teaching and learning, and they have had to be adaptable, relying on computing network technologies and tapping into the e-learning paradigm. Furthermore, one can conclude from the studies reviewed on e-learning, particularly on keeping students motivated during the COVID-19 pandemic, that there are only a few studies that examine the participation and motivation of students in the health professions during the COVID-19 pandemic. Given the scarcity of research in the aforementioned gaps, this demonstrates the need for additional or future research on e-learning, particularly on institutions that provide F2F instruction. This study is making a contribution in this regard.

2.8 CONCLUSION

This chapter provided a review of the literature on the influence of e-learning during the COVID-19 pandemic on the perceptions of health sciences students at Wits. The literature clarified the theories and how they are relevant to the study. The importance of e-learning in COVID-19 and student motivation, prior studies on e-learning, staff and student support services management, and the rationale for this research were outlined in this chapter's literature. It went on to discuss educational policies and procedures, with a focus on the topic of this study, e-learning. The researcher discussed the various types of e-learning, their benefits and limitations, the policies and practices that guide education policy, such as the Wits policy for online learning and the 2014 Distance Education policy. Finally, theories aligned with online teaching and learning in the 21st century, such as constructivism and connectivism, have been described and considered appropriate to guide the research. The following Chapter delves into the study's methodology.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter addressed the literature review, educational policies directing e-learning and related literature on e-learning, both locally and internationally. It also provided some insight into the function of e-learning in education, including its benefits, usability, problems, types, student motivation, and students' attitudes and perceptions of e-learning.

Carcary (2020) argues that the research methodology section provides readers with a road map for understanding how the study was carried out, as well as how the data were gathered and analysed. This chapter details the research methodology that was employed to compile this report. Carcary (2020) further argue that research methodology ensures the rigor and transparency of the research process, allowing for the possible evaluation and replication of the work by other researchers. Methodology has been described as the process employed in conducting the investigation (Antwi and Hamza, 2015). The research methodology chapter describes what the researcher did and how he did it, allowing readers to assess the reliability and validity of your study (Dawadi *et al.*, 2021). It explains the qualitative approaches used in the study. It further details a description of the sample as well as an explanation of the measurement devices. The sources of data, data collection methods, and data analysis were explored.

3.2 RATIONALE FOR EMPIRICAL RESEARCH

The introduction to this study (Chapter 1 Section 1.1) stated that, since the outbreak of COVID-19 in December 2019, F2F learning had to shift to e-learning overnight, and the technological tools available made it possible. It further stated that, in the digital era, e-learning enables students to connect with lecturers to gather more information. Despite the popularity of e-learning prior to the COVID-19 pandemic, universities were not fully prepared to use it. These challenges prompted the need for empirical research in the area of Wits health sciences students to determine how e-learning contributed to Wits teaching and learning during the COVID-19 pandemic through e-learning by examining the perceptions of Wits's Faculty of Health Sciences postgraduate students.

3.3 RESEARCH DESIGN

Research design is a master plan that specifies the methods and procedures for gathering and analysing the required data (Huragu and Chuma 2019). It is an investigation that provides specific guidance for research procedures (Huragu and Chuma 2019). The research design serves as the glue that holds the research project together (Dannels, 2018). Dannels (2018) posits that research design should be chosen with the research problem in mind as well as the larger context of the research topic. Asenahabi (2019) mentions that the goal of research design is to convert a research problem into data for analysis in order to provide relevant answers to research questions at the lowest possible cost. Asenahabi (2019) further argues that this is a step-by-step procedure that a researcher follows before beginning the data collection and analysis process to achieve the research objective in a valid manner. Moreover, Asenahabi (2019) argues that research design converts a research problem into data for analysis in order to provide relevant answers to research questions at the lowest possible cost. Asenahabi (2019) also states that the types of analyses that must be performed to achieve the desired results are always determined by the research design. The author (*ibid.*) also indicates that research design specifies what data is required, what methods will be used to collect and analyse the data, and how the data will be used to answer the research questions. Finally, according to Asenahabi (2019), a suitable research design is required for research to be carried out successfully.

This study will be exploratory in nature as is often used when the research topic is new, or the data collection process is challenging in some way, as argued by Shahi, Dirkson, and Majchrzak (2021). The delivery and accessibility of education have significantly changed, making the research issue of e-learning a new one for higher education as mentioned on chapter 1 section 1.1. The main method of instruction in traditional higher education has been face-to-face interaction in physical classrooms, with only sporadic use of technology for supplemental materials. E-learning, however, was made possible by the development of digital technology and the internet, which have expanded the possibilities for teaching and learning. As a result, the emergence of e-learning as a significant educational paradigm has created a number of research opportunities to comprehend its implications, effectiveness, challenges, and best practices. Investigating inventive instructional design, technological integration, learner engagement, and the overall efficacy of e-learning in higher education settings are some of the ways that researchers can make a contribution to the area.

According to Oliveira, Grenha Teixeira, Torres, and Morais (2021), exploratory research is a methodology approach that explores research questions that have not previously been studied in depth. The research paradigm and approach are discussed next as part of the research design for this study. The constructivist research paradigm places a strong emphasis on participant engagement, the examination of many perspectives, and contextual knowledge of knowledge production processes (MacLeod, Burm and Mann, 2022). The rich and varied ways in which people generate meaning and understanding in their particular situations can be captured by researchers by using qualitative and interactive methodologies (MacLeod, Burm and Mann, 2022).

3.3.1 Research paradigm

As stated in Chapter 1 Section 1.7.1, this study used a constructivist research paradigm to investigate the universe of human experience. Kamal (2019) posits that through interpretations and reflections, the experiences of this study's participants could be transformed into knowledge. According to the constructivist paradigm, research methodology should investigate minds and meaning-making, sense-making activities (Lincoln and Guba, 2013) as is common practice in qualitative research (Creswell, 2014), such as the case study approach, which employs methods such as interviews and observations. The study selected this paradigm because constructivism philosophical paradigm as is associated with the qualitative research approach.

3.3.2 Research approach

According to Abutabenjeh and Jaradat (2018), research approaches are research plans and procedures that cover everything from broad assumptions to detailed data collection, analysis, and interpretation methods. Therefore, this research used a qualitative approach in that it focused on making sense of lived, observed phenomena in a specific context with specifically selected individuals, rather than attempting to generalise from sample to population, as argued by Johnson et al (2020). Leko, Cook and Cook (2021) argued that the ability to thoroughly and in-depth examine complicated phenomena is made possible by qualitative research. Leko, Cook and Cook (2021) posit that qualitative research offers a thorough comprehension of participants' experiences, viewpoints, and meanings related to a certain occurrence. Open-ended questions and participatory data collection methods in

qualitative research enable researchers to delve deeply into participants' lived experiences and gain insights that may not be captured by quantitative methodologies, which this study examined (Leko, Cook and Cook, 2021). Cristancho, Goldszmidt, Lingard and Watling (2018) argue that qualitative research looks into how events happen in the real world, as well as processes, phenomena, and settings. As a result, Cristancho *et al.* (2018) further mention that good qualitative research produces descriptions, theories, or conceptual understanding that can be usefully transferred to other contexts.

3.3.3 Research type

Mishra (2022) posits that different methodologies used to conduct research are referred to as research types, and different types of research are better suited for certain studies based on research goals, timelines, and purposes. Therefore, for qualitative data collection, a single case study was used as a subtype or research type approach, where an online questionnaire was conducted with health sciences students at Wits. According to Guetterman and Fetters (2018), a case or cases chosen are determined by the research questions and objectives. A case study's goal is to conduct an analysis and gain a thorough understanding of a phenomenon (i.e. the case) in a real-world context (Yin, 2014). A case study is the investigation of one or more real-life cases in order to capture their complexities and details (Yin, 2014). The international and local students at Wits are the case study in this study. Alzahrani (2020) posits that in this study, case studies involving students were used to help the researcher learn more in-depth information about the experiences, viewpoints, and educational contexts of students. The researcher benefited from its aid in comprehending the many elements that affect outcomes, engagement, and learning in students (Alzahrani, 2020). Furthermore, student-centered case studies offer important insights for educators, decision-makers, and researchers looking to enhance educational practices, interventions, and policies (Alzahrani, 2020). The researcher wanted to better understand whether local and international students received the same support from the University and to understand the logistics that students faced in different geographical areas by having local and international students. Case studies have been used in a variety of fields, including political science (Gerring, 2004), education (Harland, 2014), health research (Hyett, Kenny, and Dickson-Swift, 2014), sport and leisure (Van Tuyckom and Bracke, 2014), and information technology (Cooper, 2000). According to Stake (2005), case study is not tied to specific methods but is determined by the decision to investigate a case. According to Wilhelmy and

Köhler (2022) case studies enable researchers to delve thoroughly into a particular phenomena, entity, or person. The case study gives researchers the chance to examine complicated, multifaceted issues in their natural settings while collecting rich, in-depth data that might not be feasible using conventional research approaches (Wilhelmy and Köhler, 2022).

3.4 SELECTION OF PARTICIPANTS

According to Peterson (2019), the study's selection decisions are based on the research questions, theoretical perspectives, and evidence. Litman and Robinson (2020) argue that participants are chosen based on who the researcher believes will provide the most useful information for the study. Therefore, Anatomical Sciences, Clinical Medicine, School of Oral Health Sciences, Pathology, Physiology, Public Health, and Therapeutic Sciences in the Faculty of Health Sciences at Wits during COVID-19 (as discussed in Chapter 1 Section 1.8.1) were the seven schools represented by the fourteen participants in this study. These fourteen participants, three of whom were international students from Nigeria, Zimbabwe, and Malawi, as well as eleven South African students enrolled in the Faculty of Health Sciences, Wits, were chosen in order to fully comprehend the effects of e-learning on both local and international students, as discussed in Chapter 1 section 1.8.1. These participants were all enrolled in the Faculty of Health Sciences' for Honours, MSc, and PhD programs. The researcher chose these participants in the Faculty of Health Sciences because he was employed at the faculty of health sciences and thought it would be best to conduct research with participants from which he can easily collect data. Additionally, the participants were the most pertinent participants for the study because they all pursued online education during and after the COVID-19 pandemic and could thus offer the most pertinent data regarding the research on health sciences students' perceptions of the impact of e-learning at Wits during the COVID-19 pandemic. Although many students pursuing the aforementioned degrees take online courses, some degrees in the faculty of health sciences, such as the Master of Medicine (MMed), do not. MMed students in the health sciences faculty were required to complete their clinical work at the hospital during COVID 19 because they were regarded as essential workers. As a result, these students did not participate in the study because they did not study online during COVID 19 while serving as clinical trainees. The researcher obtained the participants' contact information from the administrators of the schools in the Faculty of Health Sciences, and as a member of staff at the Faculty of Health Sciences, the

researcher obtained additional contact information for the participants on the University system in order to send questionnaires to the aforementioned fourteen participants.

To gain a thorough understanding of the impact of e-learning on both local and international students, the researcher distributed questionnaires to three international students and eleven South African students studying in the Faculty of Health Sciences. To address the research problem and understand the experiences of e-learning from a South African and international perspective, the researcher decided to have local and international participants in the study as well as representatives from the seven different schools in the faculty. The researcher identified students from each of the Faculty of Health Sciences seven schools. The researcher planned to ask follow-up questions from the answers provided by participants in the form of unstructured interviews to gather additional information from participants for this study; however, the answers received from the online questionnaires answered all of the study's questions, so there was no need to do follow-up questions in the form of interviews. Wan (2019) mentions that purposive selection, according to qualitative researchers, is the best strategy for obtaining information-rich cases that can provide in-depth insight into the subject of study. Using purposeful selection, researchers can find and choose participants who can offer rich and varied knowledge about the research issue (Campbell, Greenwood, Prior et al. 2020). This study can acquire insightful narratives and in-depth insights that contribute to a thorough understanding of the topic under questions by selecting participants with particular experiences, knowledge, or views (Campbell, Greenwood, Prior et al. 2020). As stated in Chapter 1 Section 1.8.2, the study's participants were postgraduate students in the Faculty of Health Sciences, who provided comprehensive information and had experience with both F2F and online learning. First year students were not chosen as participants because the researcher believed they would be unfamiliar with university online learning because they were attending university teaching for the first time; some of the research questions would not be answered because it required experience in both face-to-face and online learning. Consequently, the chosen participants were required to provide their perspectives from various positions explored for the rich information required. Participants' profiles are provided in Chapter 4 Section 4.2.

3.5 DATA COLLECTION TOOLS AND PROCEDURES

The research procedures and data collection procedure are described in greater detail in this section. The data collection process began with the development of the research survey instrument used to obtain ethical clearance from the UNISA College of Education research review committee, the Wits Health Sciences research committee, and the Wits Faculty of Health Sciences' Deputy Registrar. Due to the involvement of Wits health sciences students, the researcher was able to obtain research permission from the Wits Faculty of Health Sciences' research committee almost immediately after obtaining an ethical clearance certificate from the UNISA College of Education research review committee. The researcher then provided the Wits Deputy Registrar with the ethical clearance certificates from the Faculty of Health Sciences' research committee (Appendix H) and the UNISA College of Education research review committee (Appendix G) as well as the Online questionnaire letter (Appendix E) and the participant letter for the online survey (Appendix A) for the link to be sent to all health sciences participants. For the Health Sciences' research committee to issue the researcher with an ethics clearance, they also required the researcher to complete an ethics course, which the researcher registered and obtained a certificate for, which is attached as an (Appendix F).

All participants received an information sheet containing a link to the questionnaire. When they clicked on the link, it launched the questionnaire, which started with the consent form. The participant consent letter (Appendix B) gave the participants two options: agree or disagree to continue. After answering the questionnaire's questions, participants clicked the "Finish" button, which sent the collected data to the researcher's data domain for analysis. Following that, Google Forms was used to analyse the collected data by producing the necessary information.

The study anticipated fifteen participants through the online questionnaire with mainly open-ended questions (Appendix E) was used for this study; fourteen agreed to participate instead of the originally planned fifteen. The online questionnaire gathered information about one or more groups of people, such as their traits, perceptions, attitudes, or previous experiences, by asking participants questions and recording their responses (Muzari, Shava, and Shonhiwa, 2022). As a result, the questionnaire gained a greater understanding about individual or group perspectives relative to this study topic. There were three international and

eleven local participants from the health sciences faculty. Participants who were international students were chosen to provide feedback on the University's support for international students on e-learning and to gain a clear understanding of the differences between local and international students, if any. International participants were sampled to provide feedback on support for international students on e-learning at Wits during COVID-19. Getting perspectives from various participants allowed the researcher to gain a better understanding of how international students are supported and where improvements can be made.

The following section discusses the research instruments, which were questionnaires.

3.5.1 Online open-ended questionnaires

Taherdoost (2019) posits that a questionnaire is an important research tool or instrument for collecting the data. This study used open-ended questions because they provide free-form survey questions and allow participants to respond in open text format, allowing them to respond based on their complete knowledge, feeling, and understanding. According to Berg, Munthe-Kaas, Baiju, Muller, and Brurberg (2019), when it comes to revealing truthful details, open-ended questions outperform more closed questions. Berg *et al.* (2019) further mention that open-ended questions do not specify what information should be provided and encourage participants to provide rich responses in their own words.

Taherdoost (2019) mentions that questionnaires are used by decision makers and researchers in academic sectors to find answers to specific, important questions. For this study, a pilot study was conducted with four students who did not participate in the study to see if the questions provided the answers the study sought. Fraser, Fahlman, Arscott, and Guillot (2018) mention that pilot studies can help identify design issues and evaluate feasibility, practicability, resources, time, and cost of a study before the main research is conducted. The purpose of the pilot study was to test the research instrument, and changes were made to the questionnaire after the pilot study because some of the participants failed to answer some of the study's questions, citing that the questions were not clear; the researcher paraphrased some of the questions and sent them to participants to collect data. In the pilot study, the researcher did not include the question that would have aided in comparing the effect of e-learning to F2F learning; however, after receiving feedback from those who participated in the pilot study, the researcher included the question, which was

“How do you think your online learning experience compares to your in-person learning experience?” One of the non-participating students in a pilot study suggested this question and said it would be wise to include it to determine whether e-learning and face-to-face instruction can be compared. As a result, this question was included on the questionnaire that was distributed to study participants. Following the completion of the pilot study, an online questionnaire was distributed to each participant. Each online questionnaire took 30 to 60 minutes to complete and was distributed to participants via email, using Google Forms. Furthermore, between September and October 2022, each of the fourteen participants completed an online questionnaire, which provided the researcher with real-time data as it came in. The questionnaire included content sections with the participants’ biographical information such as age, gender, program, and level of study, as well as open-ended questions about health sciences students’ perceptions on the effect of e-learning at Wits during the COVID-19 pandemic.

3.6 DATA ANALYSIS

According to Duffy, Twenge, and Joiner (2019), data analysis is the process of examining data sets to identify trends and draw conclusions about the information contained within them. Bandara, Fernando, and Akter (2020) argue that data analysis enables researchers to make informed decisions and eliminates the need for guesswork. In this study, Google Forms was used to access the summary of the participants’ responses. Surveys in Google Forms can be a very good alternative as a tool for collecting information in qualitative research when combined with other traditional techniques, especially during a pandemic and quarantine period.

Data from the questionnaires, which were collected on Google Forms, was analysed. The researcher named and defined themes as listed in chapter 4 section 4.3.1. when analysing the data for this study using a thematic analysis. Each theme's name, which encapsulates the essence of the content it represents, is provided by the researcher in a clear and detailed manner. To further clarify the scope and meaning of each theme, he produced a short definition for it. These names and explanations of themes will aid in grouping and interpreting the results. Separate data analysis was intended to identify themes related to and supportive of the main aim of the study. As a result, thematic analysis was deemed a suitable method for analysing the collected data. Sundler, Lindberg, Nilsson, and Palmér (2019) proposed

that the goal of thematic analysis is to gain an understanding of patterns of meaning from data on lived experiences (i.e. participants' descriptions of experiences related to the research question in, for example, interviews or narratives). According to Sundler *et al.* (2019), the analysis starts with textual data and aims to organise meanings found in the data into patterns and, finally, themes. Sundler *et al.* (2019) argue that while conducting the analysis, the researcher strives to understand and textually describe meanings embedded in experiences.

Measures of trustworthiness of the study are discussed in the next section.

3.7 MEASURES OF TRUSTWORTHINESS

According to Kyngäs, Kääriäinen, and Elo (2020), qualitative researchers frequently disagree about which criteria are best for determining trustworthiness. As a result, during the research process, the researcher must present the views of participants in a way that is deemed accurate (King, Englander, Priest, Korthuis, and McPherson, 2020). Kyngäs *et al.* (2020) posit that credibility, transferability, dependability, confirmability, and authenticity are currently regarded as the five most important terms for determining the trustworthiness of research.

The information below provides brief explanations of the most important terms for determining trustworthiness:

Kyngäs *et al.* (2020) mention that credibility is confidence in the “truth” of the findings. The researcher returned to participants to seek confirmation that the researcher appropriately described their narratives and to obtain additional feedback in this study as discussed in Table 1.10.1 in Chapter 1. Kyngäs *et al.* (2020) argue that transferability denotes that the findings are applicable in other contexts. Kyngäs *et al.* (2020) posit that dependability represents that the findings are consistent and can be replicated. Because this study focused on health sciences students' perceptions on the effect of e-learning at Wits during the COVID-19 pandemic, dependability cannot be constant or definite. However, the participants' experiences and perceptions, as well as how they were related, were deemed authentic and accurate. Authenticity is concerned with researchers' ability to depict accurately the various realities that exist in participant data. (Kyngäs *et al.*, 2020). The researcher recorded the

questionnaire on Google Forms and then analysed the data as mentioned in Chapter 1 Table 1.10.1. According to Kyngäs *et al.* (2020), confirmability refers to the degree of neutrality, or the extent to which the findings of a study reflect the participants' opinions and experiences rather than the researchers' biases, motivations, or interests. In relation to this study, any observer can follow the research processes step by step to arrive at a point of confirmability. A trail would also allow any observer to validate the researcher's data collection and analysis methods. This is because the researcher used online questionnaires in the form of open ended-questionnaire to justify data collected; as a result, any observer can notice two different methods used that were meant to eliminate bias, among other things, and can be traced back to the above sections dealing with credibility, dependability, and transferability. Lincoln and Guba (1985) propose four constructivist criteria for trustworthiness that were like but not identical to the criteria for validity and reliability in quantitative research.

The following section discussed the study's ethical considerations:

3.8 ETHICAL CONSIDERATIONS

Pietilä, Nurmi, Halkoaho, and Kyngäs (2020) define ethical considerations in research as a set of principles that guide the design and implementation of research projects. Pietilä *et al.* (2020) further argue that voluntary participation, informed consent, anonymity, confidentiality, the potential for harm, and results communication are among these principles. According to Palaskar (2018), for ethical considerations, research participants should not be harmed in any way, and respect for research participants' dignity should be prioritised. Arifin (2018) posits that prior to the study, participants should provide full consent for ethical reasons.

The researcher adhered to the above by sending participation information to participants and clearly stating that they would not receive any direct benefits from participating in this study and that there were no consequences or disadvantages to not participating in the study. In addition, concerning confidentiality, the participant information clearly stated for participants that their names would not be recorded anywhere and that no one, other than the researcher and identified members of the research team, would be aware of their participation in this research. Participants were also informed that their participation was entirely voluntary and that they could withdraw at any time without penalty. As stated in Chapter 1 Section 1.9, the researcher sought approval to conduct the study and was granted approval by the College of

Education's research ethics committees (Appendix G) at the University of South Africa (UNISA), Health Sciences Ethics Committee (Appendix H), and the University of the Witwatersrand's Deputy Registrar (Appendix I). According to Arifin (2018), ethical principles are important in all research studies, but ethical considerations have a special resonance in qualitative studies due to the in-depth nature of the study process. Arifin (2018) also posits that it is the responsibility of the qualitative researcher to ensure that participants could choose whether to participate in the study, to protect participants' identities throughout the recruitment and dissemination process, and to promote clear and honest research reporting without deception to readers.

3.9 CONCLUSION

This chapter described the research methodology used to compile this report. The researcher, in this chapter, further described in detail how the empirical research was carried out. The process of research design, which included the research paradigm, research approach, and a research type, painted the picture for this study's research. The chapter also described the research methods, which included participant selection, data collection procedures, and processing, which included data analysis. The chapter concluded with a discussion of ethical considerations.

The following chapter focuses on the findings and interpretation of the data gathered from documents and participants.

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 INTRODUCTION

The previous chapter detailed the research design and methods used for this study. This chapter analyses the data gathered through questionnaires to address the research questions. The first section of this chapter describes the participants' profiles, while the second part presents the findings from questionnaires. This study collected data on health sciences students' perceptions on the effect of e-learning at Wits during the COVID-19 pandemic.

4.2 PARTICIPANTS' DEMOGRAPHICS

The biographical information below is as provided by the participants—which included their age, place of attendance, nationality, gender, and level of study—and aided in contextualising the study.

Table 4.2.1: Summary of student's participants demographic information

The table below provides a summary of participants who completed the online questionnaire on Google Forms.

Participant's name	Gender	Year of postgraduate study	Age	Citizenship	Place of attendance
Participant 1	Male	1st	18–24	South Africa	Urban
Participant 2	Male	2nd	25–30	Nigeria	Urban
Participant 3	Male	3 rd	30–39	Zimbabwe	Urban
Participant 4	Female	2 nd	25–30	Malawi	Rural
Participant 5	Female	2 nd	25–30	South Africa	Urban
Participant 6	Female	2 nd	30–39	South Africa	Urban
Participant 7	Female	2 nd	30–39	South Africa	Urban
Participant 8	Female	2 nd	30–39	South Africa	Urban

Participant 9	Female	2 nd	30–39	South Africa	Urban
Participant 10	Female	3 rd	40–49	South Africa	Urban
Participant 11	Female	3 rd	40–49	South Africa	Urban
Participant 12	Female	3 rd	40–49	South Africa	Urban
Participant 13	Female	4 th	50+	South Africa	Urban
Participant 14	Female	4 th	50+	South Africa	Urban

The above table shows that participants, who were Wits students in health sciences and studied via e-learning during and after COVID-19, comprised both local and international students. International students were specifically chosen to gain different perspectives, particularly on the support received. International and local students were chosen from seven different schools in the faculty. The researcher intended to get a variety of responses from both international and local students to gain different perspectives. The researcher also intended to have different perspectives from different schools by having participants from the seven different schools in the Faculty of Health Sciences, as participants could differ depending on their school and whether they were local or international students. From all the participants, thirteen students did e-learning in urban areas in Gauteng, while one attended in a rural area during the time the University closed and allowed students to study from the areas of their choice for the first time in the faculty's history.

Participants' ages ranged from their twenties to their sixties, and their level of study ranged from first year to final year, which was their fourth year of studies. All participants were postgraduate students, ranging from Honours to PhD as discussed in chapter 3 section 3.4. degrees participants in: Master of Science (MSc) in Epidemiology, MSc Medicine in Vaccinology, MSc Medicine in Psychiatric Disorders, Master of Public Health, MSc in Anatomical Science, Honours in Human Biology, MSc in Nursing, MSc in Bioethics and Health Law, and a PhD in Public Health. All students have prior experience with e-learning as well as F2F learning, having studied in person prior to the COVID-19 pandemic and online during and after the pandemic. All participants, in some way or another, had relevant knowledge of e-learning, which aided the researcher in getting the answers he needed for this study. Furthermore, all MSc and Honours students were studying their courses as coursework and research students, indicating that they were forced to switch their learning from F2F to e-learning due to the lockdown during COVID-19.

The gender of the participants in this study was not balanced as shown in the table and had no effect on the research findings because participants' responses were not influenced by gender. Participants' identities were not revealed in accordance with research ethics, and pseudonyms were used instead of their names. In terms of nationality, the above table shows that most students were local students, with three international students.

4.3 PRESENTATION OF THE FINDINGS FROM THE QUESTIONNAIRES

This discussion is about the findings of the questionnaires. The purpose of this study was to determine health sciences students' perceptions of the impact of e-learning at Wits during the COVID-19 pandemic as mentioned in Chapter 3 Section 3.2. The open-ended questionnaires were emailed to the student participants using Google Forms, and they had two weeks to respond. The participants completed the questionnaire through open-ended questions and the participants' answers were saved on Google forms. The responses resulted in four themes based on the research questions. Once the data was collected by the researcher from the questionnaires on Google Forms, the researcher named each participant by assigning a number as the answer of each participant to follow each other on their responses. The research questions were divided into questions posed to participants.

The research themes derived from the research questions and the analysis of the questionnaires are shown in Table 4.3.1.

4.3.1 Research themes

Table 4.3.1: Research themes

Research themes	Research questions	Questions to participants
4.3.1.1. The impact of e-learning on students and access to Internet	What influence did e-learning have on health sciences students at Wits during COVID-19?	What impact did e-learning have on health sciences students at the University of the Witwatersrand during COVID-19?
4.3.1.2. Technologies used to implement e-learning	Which available support/technologies for e-	Which e-learning support/technologies were

	learning platforms were available to health sciences students?	available to health sciences students? If any, did the support/ technologies available contribute to your learning?
4.3.1.3. E-learning support provided by Wits	How did the measures taken by Wits to support health sciences students assist in implementing e-learning?	How did the measures taken by the University of Witwatersrand to support health sciences students assist in implementing e-learning?
4.3.1.4 Emerging technologies in education	What e-learning possibilities emerged from Wits health sciences students during/post-pandemic environment?	What e-learning options did health sciences students at the University of the Witwatersrand have during COVID-19?

The following section presents the participants' perspectives and opinions on the research themes.

4.3.1.1 Theme 1: The impact of e-learning on students and access to internet

The first theme investigated, the impact of e-learning on learning, sought to identify the dominant influence of e-learning on students during COVID-19. It was necessary to investigate this so that the researcher could determine how this theme may have influenced the research problem and subsequent research questions. This theme had three subthemes: 1.1a) the impact of e-learning in comparison to F2F learning, 1.1b) the fulfilment of e-learning during the COVID-19 pandemic, and 1.1c) the types of factors that influenced e-learning implementation. These are discussed in detail below where the questionnaire responses of participants are discussed in greater depth.

In relation to this main theme, four questions were posed: i) What impact did e-learning have on health sciences students at the University of the Witwatersrand during COVID-19? ii) How did students in the health sciences compare their online learning experience to their in-person learning experience? iii) How would you [students] characterise your satisfaction with e-

learning during the pandemic? and iv) Which aspects of e-learning have the greatest impact on your [students'] satisfaction?

The fourteen participants who completed the online questionnaire provided a variety of responses regarding the impact of e-learning. Participants 1, 2, 3, 5 and 8 reported a positive impact in using e-learning for learning, while participants 4, 6, 7, 9, 10, 11, 13 and 14 reported a negative impact in experiencing it for the first time because they were used to F2F learning. The following participants' responses to this theme are mentioned and discussed below.

According to Participant 1, there were advantages to using e-learning as "It made it easy especially travelling for part-time students, however some requirements were difficult to fulfil due to unavailability of resources" (*sic*). Participant 2 said: "It had a positive impact. Although I did not take courses but was mentored online throughout the pandemic period" (*sic*). Participant 3 mentioned that "Students were able to cover lessons without actually coming on campus." However, Participant 4 mentioned that "Some students missed direct learning due to data or connectivity issues." On the other hand, Participant 5 added that "I found it e-learning interesting and something which needs to be implemented post COVID-19." (*sic*)

According to the responses of the participants, e-learning saves students money on transportation and has a positive impact. This is consistent with the literature of Maatuk *et al.* (2022) in Chapter 2 Section 2.4, which states that e-learning saves students and time and is cost effective. Those who had registered for research reports could still study from home while being mentored online. Jantjies (2020) went on to say that the current effects of the pandemic have kept students and lecturers at home, necessitating a shift to e-learning, as argued in Chapter 1 Section 1.2. E-learning allows students to go back to the recordings on the videos whereas F2F learning does not provide students with this option. E-learning also brought education directly to the homes of students. Others felt that e-learning did not help them with practical tasks that they needed to complete during COVID-19. Some participants raised the negative impacts of e-learning, which will be illustrated below.

Participant 6 indicated that "access to lecturers was harder", and Participant 7 stated: "Significant - it was not easy to collect data for research." Participant 8 mentioned that "[t]he dynamics changed, some students were able to adjust, and some were not as they felt like more content was given online compared to the amount they would've gotten in the

classroom. Students felt like the lecturers abused the platforms.” (*sic*) For Participant 9, there was “[I]ack of participation”. According to Participant 10: “There was poor motivation from the institution on the use of e-learning.” Participant 11 stated that “[i]t was chaotic because teaching was not adequately prepared, even up to a year into covid.” (*sic*) Participant 12 added that there were “[ne]twork challenges with online classes”.

Furthermore, Participant 13 informed the researcher that: “During Covid-19 the e-learning restricted the personal interaction between tutor and learner. Critical areas in study material could not be practiced with a tutor in class and the student was limited to engage with the tutor. Time one learning with a tutor also limited the student to ask and engage with tutor. Furthermore, with loadshedding in the bigger metros e-learning was a challenge. Not all students could afford power banks or back up power devices to stay connected via e-learning” (*sic*). In relation to personal engagement between tutor and students is made possible by the availability of communication tools and platforms created specifically for online education, such as online discussion, video conferencing. The regular flow of online classes is disrupted by load shedding, resulting in frequent pauses that make it challenging for both students and professors to stick to a regular schedule. Power outages can cause missed lectures, assignments, and discussions, which can have an impact on the learning process as a whole. Participant 14 mentioned that it “[c]reated confusion, lack of support and new way of doing things. In and load shedding made situation worse” (*sic*).

As Wits is campus-based, various challenges such as missing out on direct instruction owing to data or connectivity issues, having difficulty reaching professors and having trouble gathering data for research regarding the impact of e-learning were identified as registered students were used to studying in a F2F learning environment. Participants suggested that the University provided support for students who use e-learning. However, the participants raised the issues of network challenges, access to the Internet, and load shedding affecting those who studied online. The social constructivist limitations, which were discussed in chapter 2 section 2.2.2, that not all students in e-learning environments may have the same level of access to dependable networks or proficiency with complex digital networks, are consistent with participant 4's statement that a lack of data or connectivity issues have led students to miss direct learning. Weis, (2021). Some students had difficulty adapting to e-learning because they were used to F2F learning. Additionally, some of the study's participants preferred F2F learning because it gave them the opportunity to interact with their

peers. While there are many tools available to support engagement on online learning platforms, such as discussion boards and video conferences, face-to-face learning provides a more immediate and immersive setting for peer interaction. It promotes active participation, fosters a sense of community and belonging among students, and it fosters social and emotional development. They also raised the issue of lack of technical support from their departments, which contributed to confusion in their studies, and they were unable to study while without electricity during load shedding because some of the Internet requires electricity to connect, and devices cannot be fully charged if there is an interruption in electricity at home.

The first theme had sub-themes on the impact of e-learning, which will be extensively discussed below and will aid in answering the main questions and addressing the study's objectives. The subthemes that exist under the umbrella of each theme emerged from the questionnaires that were given to participants, and as the researcher analysed the data, these themes emerged. These sub-themes share the same central organising concept as the theme, but each focused on a distinct element.

Table 4.3.1a: Sub-themes on the impact of e-learning on students and access to Internet

Research sub-themes on the impact of e-learning on students and access to Internet	Questions to participants
4.3.1.1a) impact of e-learning in comparison to F2F learning	How would you compare your learning experience in an online learning to your experience with face-to-face learning?
4.3.1.1b) Fulfilment of e-learning during the COVID-19 pandemic	How would you describe your fulfilment with e-learning during the pandemic?
4.3.1.1c) Challenges that affected students in the implementation of e-learning	What aspects of e-learning most affect your satisfaction?

4.3.1.1a Sub theme: Impact of e-learning in comparison to F2F learning

The researcher chose this theme because he wanted to compare the impact of e-learning to F2F learning and to investigate the benefits and drawbacks of using e-learning for students versus F2F learning.

On this theme which addressed, only 13 of the 14 participants responded to the questionnaire, and one did not respond for unknown reasons; the responses are shown below:

Participant 1 stated that “Face to face learning was useful mostly for practical sessions.” (*sic*) while Participant 2 mentioned: “Learning in the comfort of my home gave me the advantage to be more focused, and also develop more time management skills.” Participant 3 illustrated: “Face to face we are able to interact with peers” (*sic*). Participant 4 indicated that “Face to face is better, however from a face-to-face class you cannot go back to the videos because it is not recorded.” (*sic*) According to Participant 5: “Online learning was cheaper, but face to face was more effective” (*sic*). When compared to traditional face-to-face learning, online learning has the potential to be more cost-effective in some ways. The necessity for students to commute to a physical campus or move to another city or country to attend classes is removed by online learning. Participant 6 posited that “[a]ccess to lecturers was harder and limited time was given to students. Trouble with the Dashboard meant figuring out on your own as tech support was impossible to get a hold of. The testing process was seamless, and it was very user friendly.” While using a dashboard for tech assistance can be more independent and result in quicker issue resolution, there are possible disadvantages such as limited experience, a lack of direction, impatience, and the possibility of mistakes. To ensure effective and precise problem resolution, it is crucial to analyse one's technical capabilities and take into account requesting external support when necessary.

Participant 7, in contrast, stated: “I prefer the face-to-face learning environment as this allows me to interact with peers and share ideas”. Participants 8 and 9 mentioned that they “preferred face to face as it was more interactive and the best for MPH”. Participant 10 argued that “[o]nline learning can be accomplished if students are given the syllabus early, and not the same week as the course starts. The course should include assessment in the syllabus. The syllabus should be made available at the beginning of the year”. Participant 12 stated:

“Online was good for distance learning”. Participant 13 mentioned that they “[f]ound e-learning tiring and lost interest at times having being lonely being used to face-to-face learning where they use to engage with lecturers physical” (*sic*). E-learning often requires spending a lot of time in front of a screen in order to complete assignments, participate in online forums, or attend virtual lectures. In addition to having a negative influence on learning and a potential reason for losing interest, too much screen time can cause physical and mental exhaustion, eye strain, and a shorter attention span. Participant 14 stated that they found it “[d]ifficult” and “[were] expected to do the learning on [their] own in comparison to being in class. Exams time still the same as physical ones while one need lot of typing as compared to face to face writing exams” (*sic*). Online examinations, which often need typing answers, can be different from traditional face-to-face exams, which require for handwriting answers. However, despite the fact that typing can often be slower than handwriting, the time given for tests in online settings may stay the same as for exams in physical settings. Furthermore, students need to properly communicate their knowledge within the allotted time and must master appropriate typing techniques. Any potential time limits during online exams can be reduced with better typing speed and accuracy.

In their responses, some students stated that they preferred e-learning as the cheaper mode of learning that helped them save money for their families, while others prefer e-learning because it allowed them to study in the comfort of their own homes without having to worry about travel or transportation logistics. Others felt that e-learning was a viable learning mode for distance education.

Some participants also viewed e-learning as a difficult mode of learning because they had to study alone without the guidance of peer interaction. Furthermore, these participants criticised the lack of technical support, claiming that they had to juggle things on their own when the lack of such support when needed. When engaging in group discussions, projects, or in-person interactions in a traditional face-to-face learning setting, students get rapid feedback from their peers and teachers. In e-learning, the absence of in-person peer contact can cause feedback to be given later than intended. This can impede learning and make it challenging to determine whether a student has understood or made progress. However, actively participating in online discussion forums can assist in peer contact and offer a channel for posing questions, exchanging ideas, and getting feedback from other students.

4.3.1.1b Sub theme: Fulfilment of e-learning during COVID-19 pandemic

All fourteen participants responded to the question "How would you describe your satisfaction with e-learning during the pandemic?" Their responses are as follows:

Participant 1 stated that they felt "fulfilled" while Participant 2 stated that they felt "highly fulfilled", and Participant 4 stated that e-learning "fulfilled everything". In contrast, Participant 3 indicated that e-learning was "average", and Participant 5 mentioned: "I was not satisfied, it was tough" (*sic*). Participant 6 indicated: "My fulfilment levels are high as it was well planned out by the university for the most part." Participant 7 posited that "[i]t served the purpose and helped to reduce the amount of time that could have been lost without it," while Participant 8 said: "moderate". Participants 9 and 10 both stated that there was "very little fulfilment and it was exhausting, and I almost failed an exam due to load shedding" (*sic*). Participant 11 indicated that e-learning was "poor", and Participant 12 said: "average". Participant 13 said: "With the pandemic my fulfilment with the e learning was about a 70%." Participant 14 mentioned that they "had very little fulfilment".

It is clear from the information above those participants 1, 2, 3, 6, 7 and 13 were satisfied with the university's online teaching and learning initiatives. Participant 8 was unsure as to whether Wits e-learning had successfully implemented e-learning or not. Participants 9, 10, 11, 12 and 14 were among those who thought that the e-learning did not fully fulfill their learning.

4.3.1.1c Sub theme: Challenges that affected students in the implementation of e-learning.

There will always be challenges in all learning; thus, the researcher wanted to examine the challenges that students may have faced while using e-learning by including this theme in this study. The responses of the participants are summarised below.

Participant 1 stated that the "network" influenced e-learning satisfaction, whereas Participant 2 raised the issue of "isolation". In raising these concerns, the participants were unequivocally stating that they had network issues in their learning that affected their learning as well as the challenge of being isolated after being used to F2F learning. Similarly, Participants 3 and

4 mentioned “internet interruption” and “connectivity” issues respectively in contrast to Participant 5, who said: “none of the challenges faced in using e-learning” (*sic*).

Participant 6 mentioned that: “the changing of learner dashboard from e-wits when tech support was unavailable made it hard to be satisfied with Ulwazi. it was bad timing to have student adjust to being remote and having to deal with new systems that were implemented on short notice.” (*sic*) Participant 7 indicated: “Slow internet connectivity at times”. Participant 8 stated: “As a student who had been exposed to face-to-face learning 3 years prior to online learning, I had to make big adjustments. Especially when we had to go home in 2020, trying to study at home was challenging”. According to Participant 9: “[w]orking with others in group settings” was a challenge. The participant clearly stated that there was no platform for working with other students in groups, which made it difficult to consult with or learn from other students. Participant 10 stated: “Inability to interact fully in a classroom setting. Participant 11 mentioned: “Syllabus availability, which includes all student responsibilities in the course”. Participant 12 stated: “Recordings”; Participant 13 indicated: “Tutor presentations, interactive sessions”. Participant 14 mentioned: “Online discussions, group discussions”.

Based on the information above, it can be concluded that the difficulties students encountered when engaging in online learning during the COVID-19 epidemic were caused by a lack of network connectivity in their local communities. Participants believed that their difficulties adjusting to e-learning, which had been introduced to them for the first time since the COVID-19 epidemic, had a negative impact on their learning. Other participants, such as participant 9, found it difficult to collaborate with others when they were working in groups since they were used to engaging with peers during face-to-face learning. This was especially difficult for participant 9 during the consultation portion. Participants also brought up the necessity for a syllabus, believing that they should receive one prior to the commencement of any online classes.

4.3.1.2 Theme 2: Technologies used to implement e-learning

This second theme aimed to identify available support/technologies for e-learning platforms students which is one of the objectives of the study. As discussed below, most participants indicated that the University used Microsoft Teams, Zoom, and other technological tools as platforms for teaching and learning.

The participants were asked which e-learning support/technologies were available to health sciences students. Participant 1 responded: “We used eFundanathi the most to check on notes as well as teams”. Participants 2, 3, 4, and 5 stated that they used “Microsoft Teams and Zoom” for teaching and learning. Participant 6 added: “none that i know of except for the dashboard” (*sic*). Participants 7 and 8 mentioned “Sakai and emails” as technology tools used for teaching and learning. Participant 9 added: “There was support from our faculty, I never used it though. For my degree particularly, our main support system was our course coordinator and she really helped.” (*sic*) Participant 10 mentioned "data," while Participants 11, 12, and 13 mentioned some of the tools mentioned by Participants 2, 3, 4, and 5: “Teams and Ulwazi (Canvas). Neutral contribution”, “Sakai Wits e learning platform and Ulwazi”, and Ulwaxi, zoom and teams” (*sic*).

The use of Microsoft Teams and Zoom dominated the technological tools used for e-learning by health sciences students. Real-time communication, video conferencing, screen sharing, and collaboration tools were all beneficial for e-learning on Zoom and Microsoft Teams. They were frequently used by educational institutions due to their simple user interfaces, dependability, and compatibility. The environment for online learning is dynamic and ever evolving and therefore there may be further new technologies and platforms that have acquired prominence such as Microsoft team, Zoom, Ulwazi and eFundanathi. Some participants mentioned using SAKAI, a Wits e-learning platform, Ulwazi, and eFundanathi were more widely used.

4.3.1.3 Theme 3: E-learning support provided by Wits

The participants were asked how Wits's measures to support health sciences students aided in the implementation of e-learning. The third theme discussed the support students received as well as areas where the University fell short. The assistance listed by participants is critical in determining the measures taken by Wits to assist health sciences students during the COVID-19 pandemic. The responses of participants to the support received by health sciences students are discussed in greater detail below.

Participant 1 indicated: “we did not miss our time”. This explains that students did not miss their academic time when the University had to close its doors due to the COVID-19

pandemic. Participant 2 agreed, stating that “measures taken were appropriate”. This was echoed by Participants 3 and 4, who responded that “it actually assisted a lot because we didn’t buy our own data bundles” and “the data provided assisted”, respectively, indicating that the data provided by the University made it easier for students to attend online classes as they did not have to worry about the added expense of buying data themselves. Participant 5 mentioned that “they were supportive” while Participant 6 stated: “not much honestly, a greater presence of technical support would have been immensely helpful”. However, Participant 7 alluded that this was significant as it “... assisted me in being able to easily have my dissertation review and submission done remotely” (*sic*). Participant 8 mentioned that “the introduction of Canvas, Ulwazi was really helpful”, and Participant 9 stated that “nothing comes to mind”. Participant 10 confirmed: “they informed us in time and prepared [us] for online learning”. This confirms that the University informed or communicated with its students about the shift in learning from F2F to e-learning to prepare them. Participants 11 and 12 indicated that “not many” and “average” measures were provided by the University. In contrast, Participant 13 stated that “the University provided ongoing support with innovative ways of e learning utilising different methodology to try and make it easier for us students. They also bought data on a monthly basis for students to be able to connect to the e-learning portal.” For Participant 14, however, the support provided by the University was “not adequate”.

Some participants confirmed that the University took appropriate measures to assist students with e-learning during the pandemic. They stated that the University ensured that students received free data monthly so that they could connect to the Internet from wherever they were to continue their studies. The University communicated effectively about how e-learning would work in transitioning from F2F to e-learning. Students benefited from the introduction of new technological tools such as Ulwazi, the Wits LMS, and the Canvas online platform to support teaching and learning. Canvas is a modern, powerful LMS used by thousands of universities worldwide, and it is hosted in the Cloud, allowing multiple users to access it at the same time. The connectivism theory also shares a common view with participant 8, as it is argued in chapter 2 section 2.2.2 that connectivism provides a framework for understanding how learners can use these networks in the contemporary digital world, where information is readily available through a variety of online platforms.

The suggestions have been noted and the study has been improved as per the suggestions. The University was able to deal with an emergency change to e-learning by being innovative and using different methodologies to try to make it easier for students to adapt and continue with their learning. While some saw the University's assistance as appropriate, others felt it was insufficient because the University provided no technical assistance to deal with ICT problems such as Internet connectivity issues, audio and video problems during online classes, software, or student portal platform compatibility issues.

This study research theme of Wits e-learning support had two sub-themes, which are clearly indicated in Table 4.3.1b below, and clearly suggest that e-learning support was lacking in health sciences students.

Table 4.3.1b: Research sub-themes on support provided by Wits on e-learning

Research sub-theme	Question to the participants
4.3.1.3a Benefits offered by e-learning during/post COVID-19	Any additional comments on rewards/benefits offered by e-learning during/post COVID-19 for local/international students
4.3.1.3b Exploring e-learning	If you had the opportunity, what would you most like to change from the current setup on e-learning?

4.3.1.3a Sub theme: Benefits offered by e-learning during/post COVID-19

Participant 2 stated that they "did not lose time and finished on time". Participant 3 indicated that e-learning was "cost effective". Participant 4 mentioned "cost savings on the part of accommodation". Participant 5 stated that "[h]ybrid session[s] should continue", and Participant 6 felt that "not having to travel to school was a big stress relief and gave [them] time to do more work". According to Participant 7: "Yes, you can attend online classes if you are sick or if you can't afford to live in a city. It increases the accessibility of graduate learning to people for can't afford accommodation at or near campuses." (*sic*) Participant 8 mentioned: "e-learning made access to information easy". Participant 9 said: "Data provision, zero-rated

sites, e-learning Wits platform was user friendly” (*sic*). Participant 10 mentioned that it “[s]aves resources example budgets” (*sic*).

The benefits mentioned above by participants clearly show that some students appreciated the University's assistance in providing them with data. Furthermore, participants concurred with Jawad and Shalash's literature that e-learning enabled them to attend classes from the comfort of their homes while saving money and time on travel expenses, indicating that e-learning is indeed cost-effective. This literature was discussed in this study's chapter 2 section 2.5.

4.3.1.3b Sub theme: Exploring e-learning

With this theme, the researcher hoped to investigate new e-learning experiences from students that would bring new ideas to educational institutions. Looking for new ideas, such as new e-learning sources, can help to improve e-learning and create better learning experiences for future generations, as argued by Koh and Kan (2021).

According to Participant 1, the University should “Provide support for international students. Whilst national students were getting support in having free data international students received none.” International students were not provided with free laptops and data as were provided by Wits to local students, which Participant 1 seems to have felt was unjust. Participant 2 mentioned that “[c]heating during online assessment is unavoidable, and hence needs rigorous examination procedure”. Participant 3 said: “Should be giving live video”. Participant 4 responded: “I would recommend hybrid, those who want to attend in person can do so.” (*sic*) Participant 6 suggested: “perhaps lecturers can provide available times on Ulwazi which students can book out as per need, in that way students will not be reliant on emails that lecturers don't answer often” (*sic*). Participant 9 indicated that “[c]ompulsory, comprehensive computer literacy courses to ensure everyone can work online, and monitoring students work to ensure participation” (*sic*) was also needed. Participant 10, however, stated: “All of the assistance provided by was excellent, and we were able to complete our academic year thanks to the University's efforts.” Participant 11 said: “Don't judge students' ability to grasp work content by your subjective opinions on what they can cope with. Especially when dealing with unprecedented mental health issues” (*sic*). According

to Participant 14: “Time given to students during assessment [needs] to be considerate of different technological needs and advancement.”

When the University was forced to close due to the lockdown prompted by COVID-19 in South Africa, it provided data for needy students; however, international students were not offered such support, leading one international participant to raise the issue of supporting all students rather than considering the nationality of students. This participant's statement is similar to the literature in Chapter 1 Section 1.2, which states that Wits provided 5,000 laptops to disadvantaged students as well as 30GB of data per month to all students in order to roll out e-learning successfully (Wits COVID-19 update, 2020), but there is no mention of whether these laptops and data were provided to international students. Cheating must also be dealt with through systems such as invigilator apps, as one participant stated that cheating during online assessments was unavoidable. Another participant suggests hybrid learning, which can accommodate those who need to attend F2F and those who do not want to study online. Participants also suggested making appointments with their lecturers while attending online individual consultation, which the researcher of this study believes can help prevent student isolation.

4.3.1.4 Theme 4: Emerging technologies in education

Participants in this study were asked what e-learning options health sciences students at Wits were offered during COVID-19. Two of the thirteen participants who responded to this question stated that health sciences provided no options for teaching and learning. According to the participants below, the top technological tools used to implement e-learning through teaching and learning were Microsoft Teams and Zooms.

Participants 1, 2, 3, 4, 5, and 9 stated that “Health Sciences implemented online learning using options such as Microsoft Teams”. Participant 3 mentioned that the University also used Zoom for teaching and learning. Furthermore, according to Participant 6, the University also used Ulwazi to ensure that online learning was implemented effectively. Participant 7 stated that “research dissertations were completed online, whereas prior to COVID-19, they were completed on hard copies”. Participant 13 stated that, during COVID-19, “all classes and exams were done online while the University was closed to minimise the virus”.

Participant 14 mentioned that “recorded lecturers were used, as well as YouTube, an online library, and power point presentations” (*sic*).

The figure below was copied from the Google Forms where participants responded to the theme's question. It provides a clear picture of what students said about the technological options they had for learning during COVID-19.

11. What e-learning options did Health Sciences students at the University of the Witwatersrand have during COVID 19?

13 responses

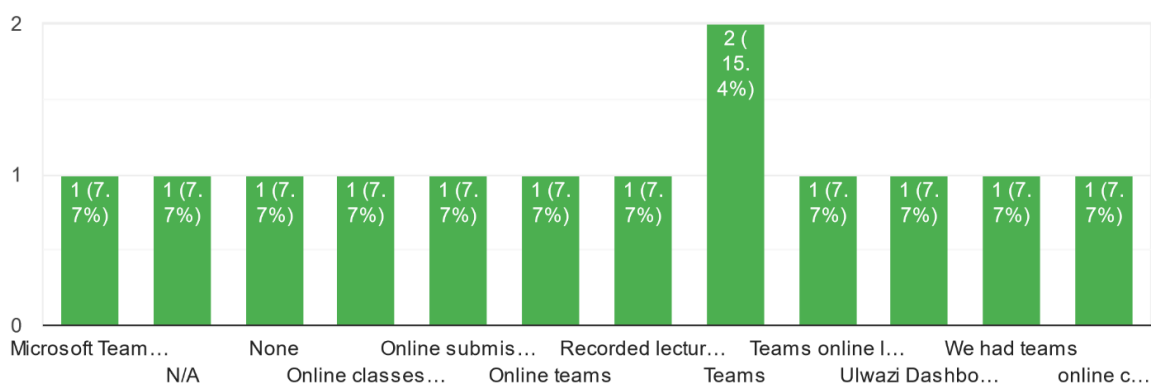


Figure 4.3.1.1.1 Students' e-learning options during COVID-19

Having emerging technologies in education requires those who can comprehend the use of digital resources; thus, this study identified a research theme in which some of the participants suggested skills or strategies that could be implemented by lecturers and students when using e-learning, such as the use of emergency technologies like Microsoft teams, Zoom, and so on. The responses are detailed in the sub-theme below.

4.3.1.4 Research theme on emerging technologies in education

The theme below, which is strategies for e-learning using emerging technologies, stems from the above-mentioned emerging technologies in education theme and is explained in detail below.

Table 4.3.1c: Strategies to be used for e-learning using emerging technologies

Research sub-theme	Question to participants
4.3.1.1.2a Strategies to be used for e-learning using emerging technologies	What would you not change about this setup under any circumstances?

4.3.1.4a Sub theme: Strategies to be used for e-learning using emerging technologies

As new technologies emerge, users may find them easier or more difficult to use. As a result, the researcher felt it was necessary to investigate the strategies that can be used with the emerging technologies that emerged from the study.

Participants 1, 3, 4, 7, and 11 stated that they would change "nothing" about the current e-learning setup, whereas Participant 2 mentioned the "platforms used" should be changed. Participant 5, however, felt that the "Ulwazi interface is very user friendly. it was well designed and gives useful pop-ups" (*sic*). Participant 6 suggested that lecturers "create more breakout rooms for discussions", and Participant 8 suggested the "ability to attend meetings from wherever". Participant 9 indicated "online live sessions" would be helpful, while Participant 10 stated that "online learning can happen". Participant 12 stated that "Health Sciences did the best they could under circumstances".

Those who responded to this sub-theme question thought that Ulwazi was very user friendly, well designed, suitable for learning, and provided useful pop-ups. They suggested that when using technologies that the University used to implement e-learning—such as Microsoft Teams, Zoom, YouTube, and so on—it was critical to have more breakout rooms for discussions. One respondent was pleased with the way e-learning is set up because it allowed people to attend meetings from wherever they were and new emerging technologies such as Zoom, and Microsoft teams provide such opportunity.

From the data presented on the aforementioned theme, the researcher can draw the conclusion that it is best for instructors to have breakout rooms when utilizing blending technologies like Zoom, YouTube, and Ulwazi. These spaces can be useful for online learning because they promote student collaboration and small-group discussions. The use

of breakout rooms allows instructors to divide their online class into smaller groups, and each group will have its own private virtual space for interaction and activities.

4.4 Conclusion

The purpose of this chapter was to report on findings from the questionnaire sent to health sciences students at Wits about the impact of e-learning during the COVID-19 pandemic. It was irrelevant in this chapter whether participants at Wits had different perspectives on the impact of e-learning during the COVID-19 pandemic. Data gathered from participants about their perspectives and experiences indicated that the current Wits e-learning setup has benefits and limitations, and that some students appreciated the University's assistance in providing data to students. Students also benefited from the e-learning setup because they could attend classes from the comfort of their own homes, saving on time and transport costs, implying that e-learning is indeed cost effective. However, some students reported feeling lonely while studying via e-learning because there was no physical interaction with their peers. There was a clear indication that incorporating emerging technologies into education necessitates the use of those who understand how to use digital resources.

The following chapter will conclude this research by summarising the findings and making some recommendations.

CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 INTRODUCTION

The collected data was analysed, presented, and interpreted in the previous chapter. This chapter has summarised the study's findings as well as its conclusions and recommendations. This study was conducted at Wits, with the purpose of investigating health sciences students' perceptions on the effect of e-learning at Wits during the COVID-19 pandemic.

This final chapter serves as a summary of the entire study. It reflects on the most important elements addressed in the study and posed the differences and similarities discovered between the literature review and the empirical study regarding the health sciences students' perceptions of the effect of e-learning at Wits during the COVID-19 pandemic. Conclusions about the findings and the themes and sub-themes that emerged will be made based on the research questions that answered the research objectives cited in Chapter 1 Section 1.5. This chapter also presents recommendations based on the findings, followed by limitations and recommendations for future research.

5.2 SUMMARY OF THE LITERATURE

The review of relevant literature conducted in Chapter 2 laid a solid theoretical and methodological foundation for the study. The theoretical frameworks that supported this study, which were Connectivism and Social Constructivism, were explained in this study. This study also discussed two relevant educational policies, including the 2014 Distance Education policy and the Wits Online Learning and Teaching policy. This study further discussed and emphasised the benefits and limitations, types, management of, and student support services in e-learning as well as e-learning during COVID-19 and student motivation.

In Chapter 2 Section 2.2, the two theoretical frameworks in the literature review focussed on were constructivism and connectivism as selected by the researcher as the best suitable theories to frame the study because this study addresses issues such as the impact of e-learning and student support in an era when technology is a dominant factor in education. The two theoretical frameworks in Chapter 2 Section 2.2 were used by the researcher to

support this study as argued by Kivunja (2018). The researcher created a theoretical framework for this study to provide a scholarly foundation for the researcher to make sense of the meaning contained in the researcher's data (Kivunja, 2018).

Addressing the two educational policies in Chapter 2 Section 2.3.1 helped to shape the principles and policy decisions that influence the field of education as well as the collection of laws and rules that govern how education systems function (Wandasari, Kristiawan, and Arafat, 2019). However, because policy governs practice, it was necessary to consult relevant policies for this study.

The significance of addressing the benefits of e-learning in the literature review was to understand the most efficient method of delivering courses via e-learning. It was mentioned in the benefits of e-learning that students can interact with their peers from all over the world through group discussions and private chats, and that studying material can be accessed an unlimited number of times. In support of what the researcher stated, Blakey and Major (2019) suggest that e-learning allows students to share their ideas on various subjects with one another and provides the option for online discussions, which typically encourage deeper understanding and yield interesting personal applications of course concepts and theories. In essence, this study discussed the benefits of e-learning as a means of explaining the worth of this mode of teaching and learning and how it solves a problem, frequently in a factual, concrete, or measurable manner (Raj, 2021).

Discussing the challenges of e-learning provided a clear view for the researcher in navigating and understanding the challenges that students, lecturers, and educational institutions have faced in implementing e-learning as outlined by the scholars consulted in this study (Simamora, 2020). Understanding these challenges through this research will help institutions, students, and lecturers in the future lay a solid foundation for success when implementing e-learning.

Education, by definition, has students who require support from institutions, lecturers, the government, and so on. As argued by Owolabi (2020) in Chapter 2 Section 2.4.3, many students who require support systems on a regular basis are troubled students, and a lack of quality support can exacerbate their perception of the quality of services and education they receive. As a result, it is critical for educational institutions to identify students who require

assistance with e-learning to ensure that students receive the quality of learning that they deserve. In the data gathered in this study, one of the participants mentioned that the assistance provided by Wits in terms of free data and laptops played a significant role in assisting those in need to complete their studies when they switched from F2F learning to e-learning in a form of blended learning. The study's literature review also stated that governments and education providers should consider providing instructors and students with standardised home-based teaching and learning equipment, conduct online teacher training, and support academic research into online education, particularly education to assist students with online learning difficulties (Huang *et al.*, 2020).

The researcher included e-learning during COVID-19 and student motivation in the literature review to address and understand the literature by other scholars on motivation students received about e-learning. Chung *et al.* (2020) also stated that students are more creative when using e-learning and that can be regarded as a motivation that comes with the use of e-learning. As mentioned in the literature review, e-learning students face various challenges, and a lack of motivation to overcome these challenges can influence students' ability not interact with educators and other students.

5.3 SUMMARY OF EMPIRICAL STUDY

This qualitative research study used an online questionnaire with open-ended questions, using Google Forms and sent via email, to collect data. The reasons and procedures for collecting, storing, and analysing data were outlined in Chapter 3 Section 3.5. As discussed in Chapter 3 Section 3.3.1, the study used a constructivism paradigm to seek to understand a phenomenon of the study through the experiences or perspectives of the participants via data collection methods (Siddiqui, 2019). As stated in Chapter 3 Section 3.3.1, this study used a qualitative method to generate descriptions, theoretical frameworks, and understanding that can be usefully transferred to the context of this study (Daniel, 2019). Purposive sampling was used by the researcher, and the case study of this research included international and local students. By purposefully selecting international and local students, the researcher hoped to identify specific types of cases. The researcher also chose participants based on their nationality to gain a clear understanding of the University's support for local and international students during COVID-19 as mentioned in Chapter 1 Section 1.8.1. This means that the researcher chose the participants he thought would provide the

best information for this study because they all studied online during and after the COVID-19 pandemic (Rahiem, 2020).

In summary, the primary data collection instrument was online questionnaires, which were designed to validate and confirm participants' responses. This study included fourteen participants from Wits's Faculty of Health Sciences; the study intended for fifteen participants but only fourteen participants responded. During COVID-19 at Wits, all participants had different levels of experience studying online. All participants were chosen based on their availability and convenience. In this regard, the data collection methods used in the study were intended to confirm and align with the responses of the participants. Section 3.7 of Chapter 3 discussed in depth aspects of trustworthiness such as credibility, dependability, transferability, and confirmability. The presentation of ethical measures was outlined in Chapter 3 Section 3.8 and indicated the ethical principles to which the research study adhered. Access to Wits students and university material, including documents (Appendixes C and I), was granted by the Faculty of Health Sciences' research committee and the Deputy Registrar's office. UNISA also granted permission to the researcher as a registered university student (Appendix G).

The research findings were presented in themes and sub-themes that emerged from the responses of the participants in Chapter 4. Findings and interpretations were made for each theme and sub-theme of the research. The first theme in Chapter 4 Section 4.3.1.1 was the impact of e-learning on students and internet access. This theme was divided into three sub-themes: the impact of e-learning in comparison to face-to-face learning, the fulfilment of e-learning during the COVID-19 pandemic, and the types of factors that influenced e-learning implementation.

According to participants, e-learning made studying cheaper and more effective for them because they were able to save money, and those conducting research were able to get mentorship while at home through online tools. Other participants felt they did not have enough data and had connectivity issues, which hampered their direct learning. One participant also stated that the University's implementation of e-learning was well planned when South Africa locked its borders to combat the spread of the COVID-19 pandemic. Some participants reported having difficulty collecting data while at home due to a lack of resources. Again, participants raised the issue of how, when the delivery shifted from F2F to e-learning,

some students were able to adjust while others were not because they felt more content was provided online than in the classroom. Even though some participants responded positively, others indicated that studying through e-learning was chaotic because lecturers were not adequately prepared, even up to a year into the COVID-19 pandemic. Others complained about feeling isolated because they missed interaction with lecturers, tutors, and their peers. Load shedding was also mentioned as a challenge that hampered learning: some students were not be able to afford power banks or backup power devices to stay connected via e-learning.

The following are the three sub-themes to which participants responded: i) the impact of e-learning in comparison to face-to-face learning, ii) e-learning fulfilment during the COVID-19 pandemic, and iii) student challenges that impacted e-learning implementation.

On the first subtheme, participants indicated that F2F learning was most beneficial during practical sessions. The participants also stated that learning in the comfort of their own homes allowed them to be more focused and develop better time management skills. The researcher believes that once students have developed more time management skills, they will be able to accomplish their goals faster, prioritise their studies, reduce their stress levels, and become more efficient in their studies. Jawad and Shalash (2020) support the participants' responses in Chapter 2 Section 2.5, stating that e-learning promotes self-learning and provides a sense of comfort in use and interaction, allowing for greater flexibility in learning time while also motivating students and improving academic performance. In further addressing this theme, one participant mentioned that F2F allowed students to interact with peers, which was also mentioned in the main theme of this sub-theme. The study also found that e-learning allowed participants to go back and watch the videos if they needed more clarity on something, whereas F2F learning did not. However, the study discovered that, while online learning is less expensive, it does not provide the same level of effectiveness as F2F learning. As the study's findings show, online learning can be accomplished if students are given the syllabus in advance rather than the same week the course begins. Furthermore, the syllabus for the course should include assessment. The participants proposed that syllabi made available at the start of the year, allowing students to plan their learning from the start. The study also discovered that e-learning was difficult because students were expected to complete the learning on their own rather than in class.

The second theme, impact of e-learning on students and Internet access, is presented in Chapter 4 Section 4.3.1.1b, and its sub-theme, fulfilment of e-learning during COVID-19 pandemic, discussed participants' opinions on whether or not e-learning fulfilled their learning during a pandemic. As stated in Chapter 4 Section 4.3.1.1a and 4.3.1.1b, some students were satisfied with how Wits implemented e-learning while others were not. Some praised the University for devising plans to use e-learning to complete the academic year while dealing with a pandemic. Participants who were dissatisfied claimed that e-learning was exhausting and that challenges such as load shedding, technical difficulties, poor internet access, a lack of information technology expertise, the inability to contact instructors, missing out on direct instruction due to data or connectivity issues, and technological difficulties nearly caused them to fail their registered courses. Additionally, it was noted that students' ability to communicate with professors and other students was impacted by their lack of drive, which made them feel alone. Since they were used to face-to-face instruction, they also had trouble transitioning to e-learning.

The final sub-theme, challenges that affected students in the implementation of e-learning, discussed in Chapter 4 Section 4.3.1.1c, and its question to participants examined challenges that impacted e-learning implementation. Participants express their opinions, which aided the researcher in determining the type of support that students may require when facing challenges in e-learning. In response to this theme, participants raised the issue of network connectivity, social isolation, and other factors that affected their learning, as previously mentioned in Chapter 4 Section 4.3.1.1a.

The section that follows will provide a summary of what was highlighted in Chapter 4 on the second theme of this study.

5.3.1 Technologies used to implement e-learning

This is the second of the study's main themes; there was no sub-theme in this section, which aided the researcher in locating the technologies used by Wits's Faculty of Health Sciences in implementing e-learning. According to the participants in this study, the health sciences faculty mostly used Microsoft Teams, Ulwazi, and Zoom to implement learning, as mentioned in Chapter 4 Section 4.3.1.4. Some participants mentioned using eFundanathi, which they

mostly used for online study materials, while others mentioned emails and Sakai, a student self-service portal, as one of the communication tools used and to receive materials.

The following section will provide a summary of the third theme of the study, which was fully explained in Chapter 4 Section 4.3.1.2

5.3.2 E-learning support provided by Wits

The third theme under e-learning support had two sub-themes: i) benefits of e-learning during/after COVID-19 and ii) exploring e-learning; both of these are presented in Chapter 4 Section 4.3.1.3. This theme aided this study in understanding or knowing the support that was provided by the University for students who used e-learning instead of F2F learning after the shift to e-learning due to the COVID-19 pandemic.

In response to the first sub-theme of e-learning support, which is the benefits of e-learning during/after COVID-19, participants indicated that e-learning was cost effective and helped them save money, particularly on accommodation because they were studying from the comfort of their own homes. One participant also stated that students could attend classes while at home, even if they were sick. Participants indicated that they were able to access information easily through e-learning, and that the data provided by the University and its e-learning platforms were user friendly.

In response to the second theme, which is exploring e-learning, this study was able to investigate the new opportunities that come with the use of e-learning, as alluded to by the study's participants. One international participant suggested that the assistance provided to local students at the University, such as free data and laptops for needy students, should have been extended to international students as well. It is in this subtheme that participants recommended that e-learning should not be the only preferred learning method for health sciences; rather, there should be a hybrid option that allows those who prefer online learning to do so while also allowing those who prefer F2F learning to do so. Participants also mentioned that the University should have mandatory computer literacy courses to help those who are unfamiliar with the use of technology.

The final theme of Chapter 4 Section 4.3.1.4 will be addressed in the section below.

5.3.3 Emerging technologies in education

The final theme of Chapter 4 is emerging technologies in education, with its sub-theme being strategies for e-learning with emerging technologies. The researcher wanted to identify new emerging technologies that Wits used to implement e-learning. With the use of emerging technologies, teachers collaborate with students on self-development and responsibility, and students are responsible for learning and contacting teachers when necessary. As a result, the researcher saw a need to include emerging technologies as one of the themes of this study. The lives of 21st-century students, who are the most frequent users of emerging technologies and online services, are profoundly impacted by new technologies (OECD, 2016).

Participants mentioned Microsoft Teams more frequently as one of the most emerging technologies used by Wits to implement e-learning, as alluded to in Chapter 4 Section 4.3.1.4; they also mentioned Zoom, Ulwazi, recorded lecturers, YouTube, and online dissertation submissions. Previously, Wits students had to submit hard copies for their research submissions, but now everything is done online, and participants in this study were completely in favour of online submissions over hard copies.

Participants also indicated that live sessions include breakout rooms that allow students in online courses to collaborate and work in smaller groups on strategies to be used for e-learning using emerging technologies, which is a single sub-theme of emerging technologies in education.

The main findings of this study on the impact of e-learning on students and Internet access discovered that e-learning saves students costs on transportation and accommodation, among other things. The study also revealed that e-learning allowed students to study at home on their own time. Educational institutions should have communication plans in place before the academic year begins to provide better orientation for students immediately in their academic studies. The study also concluded that campus-based institutions that use e-learning should encourage online group discussions to prevent students from feeling isolated while studying online as well as increasing students' attention and focus by involving them in the learning process. The findings concluded that load shedding and connectivity have a significant impact on students' ability to complete their learning.

The study discovered that the use of emergency technologies such as Microsoft Teams, Zoom, eFundanathi, YouTube, and Wits e-learning platforms such as student self-service portal and Sakai can be viewed as successful technologies to be used by lecturers and students when implementing e-learning.

The study further found that the provision of data helped those in need by providing essential resources when studying online because they did not have to worry about purchasing their own data. Online learning, according to the findings, is best suited for distance learning. According to the study, a lack of technical support made it difficult for those who faced technological challenges while studying because they had to problem-solve such issues alone in the lack of such support. This study also revealed that, through e-learning, sick students (students not feeling well) were able to connect (connectivism) to networks and construct (constructivism) knowledge using prior knowledge while at home. This study further revealed that all students registered for the institution must receive the same support regardless of where they come from (local or international), especially during a pandemic.

5.4 SYNTHESIS OF RESEARCH FINDINGS

The purpose of this section is to synthesise the research findings, contradictions, and similarities discovered between the literature review and the empirical findings presented in Chapter 4.

According to the findings in Chapter 4 Section 4.3.1.2a, e-learning helps students save costs, particularly on transportation and accommodation. To support this finding as a similarity in Chapter 2 Section 2.3.1.1, Wits (2020) posits that e-learning is more affordable, accessible, and reachable for students regardless of their location or financial status. Another similarity on e-learning saving costs confirmed the finding similarity, as mentioned in Chapter 2 Section 2.4, that e-learning is simple to use, saves time, and is cost effective, as argued by Maatuk *et al.* (2022). Another finding in Chapter 4 Section 4.3.1.1a was that students felt isolated because e-learning did not provide personal interactions between students and lecturers; this was also mentioned in Chapter 2 Section 2.5. During the hard lockdown of COVID-19, Wits and other institutions in South Africa provided needy students with resources such as data, zero-rated sites, and laptops as stated in Chapter 2 Section 2.4.3; this was also revealed in Chapter 4 Section 4.3.1.3b.

Despite the study's similarities, there were some contradictions in the findings and the literature review. Wits's policy on online learning, discussed in Chapter 2 Section 2.3.1.2, addresses student support, which includes guidance on the use of technology for learning and teaching as well as technical assistance with the online delivery system. Contrary to the Wits policy, it was discovered in Chapter 4 Section 4.3.1.1 that there was a lack of technical support as participants claimed that they had to juggle things on their own when they were unable to obtain technical support.

5.5 CONCLUSIONS

This section discusses the research conclusions in relation to the aim and research questions. The aim of this research was to investigate health sciences students' perceptions of the impact of e-learning at Wits during the COVID-19 pandemic. In this regard, the aim of this research study was to respond to four sub-questions that structured the study. The main research question was "What are health sciences students' perceptions of the impact of e-learning at Wits during the COVID-19 pandemic?" The following sub-questions supported the main research question, as indicated in Chapter 1 Section 1.4:

- i. What influence did e-learning have on health sciences students at Wits during COVID-19?
- ii. Which available support/technologies for e-learning platforms were available to health sciences students?
- iii. How did the measures taken by Wits to support health sciences students assist in implementing e-learning?
- iv. What e-learning possibilities emerged from Wits's health sciences students during/post-pandemic environment?

These questions, which are supported by themes and sub-themes from participant responses, are discussed separately in the following sections.

5.5.1 Research Question1 (RQ1): What influence did e-learning have on health sciences students at Wits during COVID-19?

Participants' experiences varied because they studied at different locations and for different degrees. However, it was clear that e-learning did save health sciences students money on transportation and accommodation. E-learning enabled health sciences students to study at home on their own schedule. Having implemented e-learning for the first time in the Faculty of Health Sciences, e-learning did play a role in assisting students to finish their academic year when the University was closed due to the lockdown in response to COVID-19. This study also concluded that using e-learning did not provide personal interactions, not only between students and lecturers, but also among peers.

5.5.2 RQ2: Which available support/technologies for e-learning platforms were available to health sciences students?

It was fascinating to investigate the e-learning support and technologies available to participants as new emerging technologies. More similarities on emerging technologies such as Microsoft Teams, Zoom, and YouTube can be found in the participants' responses to technologies for e-learning platforms that were available to students. In this regard, participants were asked to indicate the technological tools used by the University to implement e-learning; the study found that Microsoft Teams, Ulwazi, and Zoom were the available technological tools that the University used to implement learning, as mentioned in Chapter 4 in Section 4.3.1.4. Participants also used eFundanathi and Sakai as technological tools and found them to be beneficial and helpful. The student self-service portal was used as a LMS, and email was also available as a communication tool and to disseminate study materials to students. The researcher can conclude that by having the above appropriate technologies, the University was able to implement fully what is written in its policy by providing a sustainable and reliable platform for effective learning and teaching to take place, as mentioned by Wits (2020) in Chapter 2 Section 2.3.1.2.

5.5.3 RQ3: How did the measures taken by Wits to support health sciences students assist in implementing e-learning?

In addition to understanding the University's measures of student support, the researcher wished to investigate new benefits that other institutions could use to assist students in implementing e-learning and to discover the support that worked for Wits. There were both differences and similarities in the University's measures between local and international students. Local students thought the University's measures were appropriate because the institution provided free data to needy local students, whereas international students did not receive assistance with data. As a result, this study concluded that the University's measures for providing free data to students were commendable in terms of considering those in need; however, the University must cater to all students and not exclude students based on their nationality for the sake of parity. Wits will carry out the ideas of its policy by ensuring that all students are catered for in terms of support by providing free data to all students in need and making online learning more accessible as argued by Wits (2020) in Chapter 2 Section 2.3.1.2.

The study also discovered a lack of technological support from the University, based on participants responses, which hampered students' ability to learn when experiencing technological issues. The researcher, as a member of staff, is aware that the University has an ICT department that deals with technical problems for staff and students; however, based on the responses of the participants, the researcher concluded that the faculty requires its own department to deal with e-learning technical problems for students and lecturers. However, Wits's communication regarding the e-learning processes was appreciated by the participants; thus, this study concluded that educational institutions are required to provide orientation in terms of how e-learning will unfold as a way of supporting students who are unfamiliar with e-learning.

5.5.4 RQ4: What e-learning possibilities emerged from Wits's health sciences students during/post-pandemic environment?

According to the findings, tools like Microsoft Teams, Zoom, and YouTube had a positive impact on the participants' learning because lecturers used them to teach students directly. Students benefited from the use of emerging technologies because it allowed them to record their sessions so that they could listen to the lecturers later in their own time and learn at their own pace. When using emerging technologies such as Microsoft Teams, Zoom, and YouTube, classes must allow for more breakout rooms for discussions and encourage collaborative learning. This study discovered that emerging technologies provide an opportunity for interactive learning by allowing students to participate in online discussions. The study also discovered that these emerging technologies provided live streaming options for learning, allowing students to watch, create, and share videos in real time.

Main research question: What are health sciences students' perceptions of the effect of e-learning at Wits during the COVID-19 pandemic?

According to the empirical research presented in chapter 5 section 5.3, e-learning enabled students to save money while studying, and those conducting research were able to receive mentoring while working from home using online resources. With the help of e-learning, students could learn while relaxing in their own homes, which helped them concentrate better and improve their time management skills. Students were impacted by e-learning because participants had the option to review the videos if they needed more clarification on a subject, whereas this opportunity might be limited in a face-to-face setting. Students who use e-learning can cut costs on things like lodging and travel. The provision of data by the University made it easier for those in need to study online because they did not have to worry about buying their own data. Students benefit from having course coordinators for e-learning because they can better understand the requirements for their courses, and because the coordinator will be solely in charge of the given course, it also facilitates timely feedback.

5.6 RECOMMENDATIONS

According to Miles, Huberman, and Saldaña (2018), research recommendations are suggestions to improve the research field based on research results; they also assist the reader in understanding the broader content and tell the reader what can be changed in the future based on the research results. The research outcomes of this study were provided by online open-ended questionnaires and analysis; based on the findings, this research makes recommendations relating to health sciences students' perceptions of the effect of e-learning at Wits during the COVID-19. The following recommendations should be considered as guidelines for Wits.

5.6.1 Recommendations to Wits management

In collaboration with the University's senior management, each faculty should consider having ICT departments in each faculty that will address students' technical problems when they face challenges with technical issues with their digital equipment. Based on the study's literature review, the researcher recommends that management always have teams solely responsible for sourcing funds and e-learning resources to assist in providing free data and digital resources to students from underprivileged backgrounds. When providing these resources, such as data and laptops, to students, the University must always consider international students, as they, too, require support to implement their learning effectively while enrolled at the University. There should also be optional online courses available at the University for those who are unfamiliar with the use of the digital resources to address a digital divide among students. Finally, there must always be a contingency plan in place to deal with load shedding and networking issues in order to avoid students failing their courses as a result of such consequences.

5.6.2 Recommendations to e-learning course instructors

To achieve interactive and collaborative learning, the course instructors must consider having breakaway rooms when using technological tools such as Microsoft Teams and Zoom. This will provide students with opportunities for engagement because it will allow them to learn in an interactive and collaborative manner, preventing students from feeling isolated while learning. Students must be given the syllabus early, rather than the week the course begins.

The course syllabus should include assessment, and the syllabus should be made available at the start of the year.

5.6.3 Recommendations to e-learning course developers

When designing online courses and course materials, course developers must plan for their students' use of emerging technologies such as Microsoft Teams, Zoom, and YouTube in communication, accessing content, participating in learning activities, and interacting with fellow students and course instructors. The use of emerging technologies in teaching and learning must be designed in such a way that it allows for timely feedback, cooperation, and interaction between lecturers and students. As a result, they will ensure that students do not feel isolated when using e-learning.

5.6.4 Recommendations to e-learning students

E-learning students should explore all the benefits of emergency technology and make full use of the emerging technologies available to them. Students should participate in academic activities such as sharing their knowledge and connecting with other online students who can learn from or build on that expertise as well as content sharing using technological tools.

5.7 SUGGESTIONS FOR FURTHER RESEARCH

The scope of this research study on the impact of e-learning during COVID-19 was limited to Wits's Faculty of Health Sciences, with fourteen participants. It is recommended that researchers conduct more qualitative research on students' perceptions of the impact of e-learning after the COVID-19 at various higher education institutions that used F2F learning prior to the COVID-19 pandemic and only shifted their education online due to COVID-19. To compare the impact of e-learning, a comparative study involving academic staff and students at higher learning institutions, such as contact and distance institutions, could be conducted. This comparison may be useful, especially since some contact institutions have recently established distance learning units. This research reveals challenges in the implementation of e-learning in contact institutions, which could be improved with additional research on the impact of e-learning.

As a result of addressing some of the challenges revealed in this research, there are several themes that emerged from the study that may require additional attention in the field of e-learning, and these themes were only briefly covered. The following are some themes that could be considered for future research:

- Emerging technologies in higher education. Emerging technologies will remain relevant as long as we have technologies to support our teaching and learning.
- Support by educational institutions for online students

5.8 LIMITATIONS OF THE STUDY

A limitation of a study design or instrument, according to Ross and Bibler Zaidi (2019), is systematic bias that the researcher did not or could not control and that could inappropriately affect the results. Firstly, the study only included one faculty at one university, and the results may differ in other contexts because other faculties, such as Engineering and the Built Environment (EBE), Commerce, Law, and Management (CLM), Humanities, and Science may have used different strategies to implement their e-learning. Despite this limitation, the goal was to gain an in-depth understanding of health sciences students' perceptions of the impact of e-learning at Wits during the COVID-19 pandemic, and the researcher believes that the study contributed to this.

Secondly, students to whom the researcher sent the pilot study delayed responding, requiring the researcher to conduct numerous follow-ups until he received four responses from students who were not a part of the study. Participants in the study were also slow in responding to the questionnaire, which required the researcher to wait for the responses before proceeding with the study analysis. To reach the target number of selected participants, the researcher had to conduct numerous follow-ups via email and phone as well as request the administrators of the health sciences faculty to send the questionnaire on the researcher's behalf. The participants cited being involved in exams as a reason for their delay in responding to the study because the researcher sent his questionnaire during exam time. Despite these limitations, it is believed that this study produced valuable data and added to the body of knowledge in the field of e-learning.

5.9 CONCLUSION

The purpose of this study was to investigate health sciences students' perceptions on the impact of e-learning at the University of the Witwatersrand during the COVID-19 pandemic. This qualitative study collected data from fourteen participants through an online questionnaire. All participants studied health sciences; eleven were South African students and three international students.

Following data collection via Google forms, thematic data analysis was used to identify themes and produce the findings presented. According to the findings, e-learning helps students save money on transportation and accommodation. Students could study at home on their own time thanks to e-learning. During a pandemic, e-learning can help students complete their academic year without delay. This study also concluded that using e-learning does not allow for personal interactions, not only between students and lecturers, but also between peers.

The study concluded that the University used Microsoft Teams, Ulwazi, and Zoom as available technological tools to implement e-learning. This study also concluded that the University's measures of providing free data to students were commendable in terms of considering those in need; however, for the sake of parity, the University must cater to all students rather than excluding students based on their nationality. The findings also revealed that new technologies enabled interactive learning by allowing students to participate in online discussions. Finally, the study concluded that emerging technologies offered live streaming learning options, allowing students to watch, create, and share videos in real time.

LIST OF REFERENCES

- Aboagye, E., Yawson, J.A. & Appiah, K.N. 2021. COVID-19 and E-learning: The challenges of students in tertiary institutions. *Social Education Research*, 1–8.
- Abdulaziz, A.O. & Baqer, M.N. 2023. Opinions Of Iraqi College Students on Virtual English Classrooms. *Resmilitaris*, 13(1):1715–1727.
- Abutabenjeh, S. & Jaradat, R. 2018. Clarification of research design, research methods, and research methodology: A guide for public administration researchers and practitioners. *Teaching Public Administration*, 36(3):237–258.
- Agormedah, E.K., Henaku, E.A., Ayite, D.M.K. & Ansah, E.A. 2020. Online learning in higher education during COVID-19 pandemic: A case of Ghana. *Journal of Educational Technology and Online Learning*, 3(3):183–210.
- Akpan-Obong, D. 2021. Covid-19 and African E-Learning Systems: Structural and Institutional Strategies for Resilience and Antifragility. Available at: SSRN 3898389.
- Al-Fraihat, D., Joy, M. & Sinclair, J. 2020. Evaluating E-learning systems success: An empirical study. *Computers in Human Behavior*, 102:67–86.
- Alghizzawi, M., Habes, M., Salloum, S.A., Ghani, M.A., Mhamdi, C. & Shaalan, K. 2019. The effect of social media usage on students'e-learning acceptance in higher education: A case study from the United Arab Emirates. *Int. J. Inf. Technol. Lang. Stud*, 3(3):13–26.
- Ali, W. 2020. Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher Education Studies*, 10(3):16–25.
- Aliyyah, R.R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M. & Tambunan, A.R.S. 2020. The perceptions of primary school teachers of online learning during the COVID-19 pandemic period: A case study in Indonesia. *Journal of Ethnic and Cultural Studies*, 7(2):90–109.
- Al Maawali, W.S. 2022. Experiential writing through connectivism learning theory: a case study of English language students in oman higher education. *Reflective Practice*, 1–14.
- Al-Saggaf, M.A. & Rosli, A.S. 2021. The Level of Community of Inquiry (CoI) Presences in Online Classes among MSU BTESL Students. *TESOL and Technology Studies*, 2(1):65–78.
- Ali, S. 2017. E-learning implementation barriers: impact of student's individual cultural orientation on e-learning device acceptance. University of Reading.

- Alshehri, Y.A., Mordhah, N., Alsibiani, S., Alsobhi, S. & Alnazzawi, N. 2020. How the regular teaching converted to fully online teaching in Saudi Arabia during the Coronavirus COVID-19. *Creative Education*, 11(7):985–996.
- Alsoud, A.R. & Harasis, A.A. 2021. The impact of COVID-19 pandemic on students' e-learning experience in Jordan. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(5):1404–1414.
- Alzahrani, N.M., 2020. Augmented reality: A systematic review of its benefits and challenges in e-learning contexts. *Applied Sciences*, 10(16), p.5660.
- Ananga, P. 2020. Pedagogical considerations of e-learning in education for development in the face of COVID-19. *Education*.
- Arifin, S.R.M. 2018. Ethical considerations in qualitative study. *International Journal of Care Scholars*, 1(2):30–33.
- Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N. & Umek, L. 2020. Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability*, 12(20):8438.
- Asenahabi, B.M. 2019. Basics of research design: A guide to selecting appropriate research design. *International Journal of Contemporary Applied Researches*, 6(5):76–89.
- Ashour, S., El-Refae, G.A. & Zaitoun, E.A. 2021. Post-pandemic higher education: Perspectives from university leaders and educational experts in the United Arab Emirates. *Higher Education for the Future*, 8(2):219–238.
- Atmowardoyo, H. 2018. Research methods in TEFL studies: Descriptive research, case study, error analysis, and R&D. *Journal of Language Teaching and Research*, 9(1):197–204.
- Ayu, M. 2020. Online learning: Leading e-learning at higher education. *The Journal of English Literacy Education: The Teaching and Learning of English as a Foreign Language*, 7(1):47–54.
- Babu, G.S. & Sridevi, K. 2018. Importance of E-learning in Higher Education: A study. *International Journal of Research Culture Society*, 2(5):1–8.
- Badaru, K.A. and Adu, E.O., 2022. Platformisation of Education: An Analysis of South African Universities' Learning Management Systems. *Research in Social Sciences and Technology*, 7(2), pp.66-86.
- Bandara, R., Fernando, M. & Akter, S. 2020. Explicating the privacy paradox: A qualitative inquiry of online shopping consumers. *Journal of Retailing and Consumer Services*, 52:101947.

- Berg, R., Munthe-Kaas, H.M., Baiju, N., Muller, A.E. & Brurberg, K.G. 2019. The accuracy of using open-ended questions in structured conversations with children: a systematic review.
- Bhandari, R. 2017. Making distance learning effective: A new approach in maritime education & training. *Making e-learning effective benefits of elearning barriers to implementing e-Learning*, 12(1):1–16.
- Bhat, S., Raju, R., Bikramjit, A. & D'Souza, R. 2018. Leveraging E-learning through Google classroom: A usability study. *Journal of Engineering Education Transformations*, 31(3):129–135.
- Blackman, S.N. 2021. The impact of Covid-19 on education equity: A view from Barbados and Jamaica. *Prospects*, 1–15.
- Blakey, C.H. & Major, C.H. 2019. Student perceptions of engagement in online courses: An exploratory study. *Online Journal of Distance Learning Administration*, 22(4):4.
- Boyras, S. & Ocak, G. 2021. Connectivism: a literature review for the new pathway of pandemic driven education. *International Journal of Innovation Science Res Technology*, 6(3):1122–1129.
- Braun, V., Clarke, V., Boulton, E., Davey, L. & McEvoy, C. 2020. The online survey as a qualitative research tool. *International Journal of Social Research Methodology*, 1–14.
- Braun, V. & Clarke, V. 2021. One size fits all? What counts as quality practice in (reflexive) thematic analysis?. *Qualitative Research in Psychology*, 18(3):328–352.
- Cai, Y. 2018. What drives the choices of mixed methods in higher education research. *In Theoretical and Methodological Perspectives on Higher Education Management and Transformation*, pp.29–50.
- Carcary, M., 2020. The research audit trail: Methodological guidance for application in practice. *Electronic Journal of Business Research Methods*, 18(2), pp.pp166-177.
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D. and Walker, K., 2020. Purposive sampling: complex or simple? Research case examples. *Journal of research in Nursing*, 25(8), pp.652-661.
- Chikwanda, N.N.S., 2020. Learner-centred practices in primary school human ecology classrooms: a case of selected schools in chankhanga zone, kasungu district (Doctoral dissertation, Mzuzu University).
- Chopra, G., Madan, P., Jaisingh, P. & Bhaskar, P. 2019. Effectiveness of e-learning portal from students' perspective: A structural equation model (SEM) approach. *Interactive Technology and Smart Education*.

- Chung, E., Noor, N.M. & Mathew, V.N. 2020. Are you ready? An assessment of online learning readiness among university students. *International Journal of Academic Research in Progressive Education and Development*, 9(1):301–317.
- Clark, K.R. 2018. Learning theories: constructivism. *Radiologic Technology*, 90(2):180–182.
- Collins, C.S. & Stockton, C.M. 2018. The central role of theory in qualitative research. *International Journal of Qualitative Methods*, 17(1):1609406918797475.
- Corbett, F. & Spinello, E. 2020. Connectivism and leadership: harnessing a learning theory for the digital age to redefine leadership in the twenty-first century. *Heliyon*, 6(1):e03250.
- Cr, K. 2020. Research methodology methods and techniques.
- Cristancho, S.M., Goldszmidt, M., Lingard, L. & Watling, C. 2018. Qualitative research essentials for medical education. *Singapore Medical Journal*, 59(12):622.
- Dacholfany, M.I., Saifi, I.L. and Sulaiman, S., 2022. Connectivism And Constructivism Approaches To Social Learning Theory. *International Journal of Education, Vocational and Social Science*, 1(01), pp.1-19.
- Dale, P., Sporne, I., Knight, J., Sheaves, M., Eslami-Andergoli, L. & Dwyer, P. 2019. A conceptual model to improve links between science, policy and practice in coastal management. *Marine Policy*, 103:42–49.
- Dannels, S.A., 2018. Research design. In *The reviewer's guide to quantitative methods in the social sciences* (pp. 402-416). Routledge.
- Daniel, B.K. 2019. Using the TACT framework to learn the principles of rigour in qualitative research. *Electronic Journal of Business Research Methods*, 17(3):118–129.
- Dannels, S.A. 2018. Research design. In Hancock, G.R. 2010. *The reviewer's guide to quantitative methods in the social sciences*. pp. 402–416. USA: Routledge.
- Dawadi, S., Shrestha, S. & Giri, R.A. 2021. Mixed-methods research: A discussion on its types, challenges, and criticisms. *Online Submission*, 2(2):25–36.
- Deas, T.L. 2021. *When the Learning Environment Becomes E-Learning: a Narrative Inquiry into High School Honors Students' Motivation* (Doctoral dissertation, University of South Carolina).
- Decuypere, M. 2019. Open Education platforms: Theoretical ideas, digital operations and the figure of the open learner. *European Educational Research Journal*, 18(4):439–460.
- De La Cerda, Y., 2019. *Communicating About Clinical Depression: A Thematic Analysis of Successes and Failures in Real-Life Support Attempts* (Doctoral dissertation, The University of Texas at San Antonio).

- Dempsey, N.M., Richardson, D.J., Cope, E. and Cronin, C.J., 2021. Creating and disseminating coach education policy: A case of formal coach education in grassroots football. *Sport, Education and Society*, 26(8), pp.917-930.
- Després-Bedward, A., Avery, T.L. & Phirangee, K. 2018. Student perspectives on the role of the instructor in face-to-face and online learning. *International Journal of Information and Education Technology*, 8(10):706–712.
- Diwakar, S., Achuthan, K. and Nair, B., 2020. Adoption of Virtual Laboratories in India, Learning Assessments and Roles of ICT Skill Learning Tools. In *Encyclopedia of Education and Information Technologies* (pp. 13-20). Cham: Springer International Publishing.
- Duffy, M.E., Twenge, J.M. & Joiner, T.E. 2019. Trends in mood and anxiety symptoms and suicide-related outcomes among US undergraduates, 2007–2018: Evidence from two national surveys. *Journal of Adolescent Health*, 65(5):590–598.
- Eldh, A.C., Årestedt, L. & Berterö, C. 2020. Quotations in qualitative studies: Reflections on constituents, custom, and purpose. *International Journal of Qualitative Methods*, 19. <https://doi.org/10.1177/1609406920969268>
- Elfaki, N.K., Abdulraheem, I. and Abdulrahim, R., 2019. Impact of e-learning vs traditional learning on student's performance and attitude. *International Journal of Medical Research & Health Sciences*, 8(10), pp.76-82.
- Encarnacion, R.F.E., Galang, A.A.D. & Hallar, B.J.A. 2021. The impact and effectiveness of e-learning on teaching and learning. *Online Submission*, 5(1):383–397.
- Ercömert, Ç. and Güneş, S., 2021. Industrial Design Education: A Research on Generation Theories and Change in Turkey. *Design and Technology Education: an International Journal*, 26(3), pp.136-158.
- Fathoni, A. & Retnawati, H. 2021. Challenges and strategies of postgraduate students in online learning during the Covid-19 pandemic. *Jurnal Prima Edukasia*, 9(2):2021.
- Farrugia, B. 2019. WASP (write a scientific paper): Sampling in qualitative research. *Early Human Development*, 133:69–71.
- Ferguson, B.T., McKenzie, J., Dalton, E.M. & Lyner-Cleophas, M. 2019. Inclusion, universal design and universal design for learning in higher education: South Africa and the United States. *African Journal of Disability*, 8(1):1–7.

- Fraser, J., Fahlman, D.W., Arscott, J. & Guillot, I. 2018. Pilot testing for feasibility in a study of student retention and attrition in online undergraduate programs. *The International Review of Research in Open and Distributed Learning*, 19(1).
- Gamage, D., Staubitz, T. and Whiting, M., 2021. Peer assessment in MOOCs: Systematic literature review. *Distance Education*, 42(2), pp.268-289.
- Gharti, L., 2019. Self-directed learning for learner autonomy: Teachers' and Students' perceptions. *Journal of NELTA Gandaki*, 1, pp.62-73.
- Guetterman, T.C. & Fetters, M.D. 2018. Two methodological approaches to the integration of mixed methods and case study designs: A systematic review. *American Behavioral Scientist*, 62(7):900–918.
- Hanson, J. 2009. Displaced but not replaced: the impact of e-learning on academic identities in higher education. *Teaching in Higher Education*, 14:553–64.
- Hendricks, G.P. 2019. Connectivism as a learning theory and Its relation to open distance education. *Progressio*, 41(1):1–13.
- Humbatova, N., Jahangirova, G., Bavota, G., Riccio, V., Stocco, A. & Tonella, P. June 2020. Taxonomy of real faults in deep learning systems. In *Proceedings of the ACM/IEEE 42nd International Conference on Software Engineering* (pp. 1110–1121). Seoul, South Korea. 27 June–19 July 2020.
- Hume, K., 2021. Optimising performance through self-regulation. *Training & Development*, 48(4), pp.22-25.
- Huragu, M. & Chuma, R.M. 2019. The impact of organisational culture on public sector performance: A case study of local authorities in Zimbabwe. *International Journal of Public Policy and Administration Research*, 6(1):33–56.
- Iqbal, T. 2020. Medical students'e-learning during Covid-19 lockdown. *Pakistan Journal of Physiology* 16(1):1–2.
- Irfan, M., Kusumaningrum, B., Yulia, Y. & Widodo, S.A. 2020. Challenges during the pandemic: use of e-learning in mathematics learning in higher education. *Infinity Journal*, 9(2):147–158.
- Islam, A., Ahmed, A., Naqvi, I.H. & Parveen, S. 2020. Emergence of deadly severe acute respiratory syndrome Coronavirus-2 during 2019–2020. *VirusDisease*, 31(2):128–136.
- Jacobs, L. 2020. Embedding ethical principles in the information science research process. In *Handbook of Research on Connecting Research Methods for Information Science Research* (pp. 52-79). IGI Global.

- James, J. and James, J., 2022. Understanding changes in science teachers' classroom practices. *International Journal of Science Education*, 30(10), pp.1405-1416.
- Jantjies, M. 2020. "How South Africa can address digital inequalities in e-learning." 29 April 2020. *The Conversation*. Retrieved from: <https://theconversation.com/how-south-africa-can-address-digital-inequalities-in-e-learning-137086>.
- Jawad, Y.A.L.A. & Shalash, B. 2020. The Impact of E-Learning Strategy on Students' Academic Achievement Case Study: Al-Quds Open University. *International Journal of Higher Education*, 9(6):44–53.
- Jena, P.K., 2020. Impact of pandemic COVID-19 on education in India. *International journal of current research (IJCR)*, 12.
- Jie, Z., Puteh, M. & Sazalli, N.A.H. 2020. A social constructivism framing of mobile pedagogy in english language teaching in the digital era. *Indonesian Journal of Electrical Engineering and Computer Science*, 20(2):830–836.
- Johnson, D.R., Scheitle, C.P. & Ecklund, E.H. 2021. Beyond the in-person interview? How interview quality varies across in-person, telephone, and Skype interviews. *Social Science Computer Review*, 39(6):1142–1158.
- Johnson, J.L., Adkins, D. & Chauvin, S. 2020. A review of the quality indicators of rigor in qualitative research. *American Journal of Pharmaceutical Education*, 84(1).
- Kaisara, G. and Bwalya, K.J. 2021. Investigating the E-learning challenges faced by students during COVID-19 in Namibia. *International Journal of Higher Education*, 10(1):308–318.
- Kersbergen, M.J., Creugers, N.H., Hollaar, V.R. and Laurant, M.G., 2020. Perceptions of interprofessional collaboration in education of dentists and dental hygienists and the impact on dental practice in the Netherlands: A qualitative study. *European Journal of Dental Education*, 24(1), pp.145-153.
- Kamal, S.S.L.B.A. 2019. Research paradigm and the philosophical foundations of a qualitative study. *PEOPLE: International Journal of Social Sciences*, 4(3):1386–1394.
- Khatri, K.K. 2020. Research paradigm: A philosophy of educational research. *International Journal of English Literature and Social Sciences*, 5(5):1435–1440.
- King, C., Englander, H., Priest, K.C., Korthuis, P.T. & McPherson, S. 2020. Addressing missing data in substance use research: A review and data justice-based approach. *Journal of Addiction Medicine*, 14(6):454.

- Kivunja, C. 2018. Distinguishing between theory, theoretical framework, and conceptual framework: A systematic review of lessons from the field. *International Journal of Higher Education*, 7(6):44–53.
- Kivunja, C. & Kuyini, A.B. 2017. Understanding and applying research paradigms in educational contexts. *International Journal of higher education*, 6(5):26–41.
- Koh, J.H.L. & Kan, R.Y.P. 2021. Students' use of learning management systems and desired e-learning experiences: Are they ready for next generation digital learning environments? *Higher Education Research & Development*, 40(5):995–1010.
- Köhler, T., Romyantseva, M. and Welch, C., 2023. Cross-Study Re-Examinations: Qualitative Research Designs For Retheorizing.
- Kohnke, L. and Moorhouse, B.L., 2021. Adopting HyFlex in higher education in response to COVID-19: students' perspectives. *Open Learning: The Journal of Open, Distance and e-Learning*, 36(3), pp.231-244.
- Kokkonos, A. and Korres, M.P., 2021. IT Opportunities for Teacher Training and Support: An Action Research During the COVID-19 Pandemic in Greece. In *Handbook of Research on Analyzing IT Opportunities for Inclusive Digital Learning* (pp. 192-214). IGI Global.
- Korstjens, I. & Moser, A. 2018. Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1):120–124.
- Kumar, V. & Sharma, D. 2021. E-learning theories, components, and cloud computing-based learning platforms. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, 16(3):1–16.
- Kyngäs, H., Kääriäinen, M. & Elo, S. 2020. "The trustworthiness of content analysis". In Kyngäs, H., Kääriäinen, M. and Elo, S. (eds.). 2020. *The application of content analysis in nursing science research* (pp. 41-48). Springer, Cham.
- Lawrence, M.G., Williams, S., Nanz, P. & Renn, O. 2022. Characteristics, potentials, and challenges of transdisciplinary research. *One Earth*, 5(1):44–61.
- Legg-Jack, D.W. 2022. E-Learning of the Timber Processing and Application Course at a South African University amidst the Covid-19 Pandemic. *E-Journal of Humanities, Arts and Social Sciences (EHASS)*, 3(4):85–101. Retrieved from: <https://doi.org/10.38159/ehass.2022341>.
- Leko, M.M., Cook, B.G. & Cook, L. 2021. Qualitative Methods in Special Education Research. *Learning Disabilities Research & Practice*, 36(4):278–286.

- Litman, L. & Robinson, J. 2020. *Conducting online research on Amazon Mechanical Turk and beyond*. USA: Sage Publications.
- Loewen, S., Gönülal, T., Isbell, D.R., Ballard, L., Crowther, D., Lim, J., Maloney, J. & Tigchelaar, M. 2020. How knowledgeable are applied linguistics and SLA researchers about basic statistics?: Data from North America and Europe. *Studies in Second Language Acquisition*, 42(4):871–890.
- Lone, S.A. & Ahmad, A. 2020. COVID-19 pandemic—an African perspective. *Emerging microbes & infections*, 9(1):1300–1308.
- Maatuk, A. M., Elberkawi, E. K., Aljawarneh, S., Rashaideh, H. & Alharbi, H. 2021. The COVID-19 Pandemic and E-learning: Challenges and Opportunities from the Perspective of Students and Instructors. *Journal of Computing in Higher Education*, 1–18.
- Maatuk, A.M., Elberkawi, E.K., Aljawarneh, S., Rashaideh, H. & Alharbi, H. 2022. The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. *Journal of Computing in Higher Education*, 34(1):21–38.
- MacLeod, A., Burm, S. and Mann, K., 2022. Constructivism: learning theories and approaches to research. *Researching Medical Education*, pp.25-40.
- Maphalala, M.C. & Adigun, O.T. 2021. Academics' Experience of Implementing E-Learning in a South African Higher Education Institution. *International Journal of Higher Education*, 10(1):1–13.
- Maphosa, V. 2021. Factors influencing student's perceptions towards e-learning adoption during COVID-19 pandemic: A developing country context. *European Journal of Interactive Multimedia and Education*, 2(2):02109.
- Mapuva, J. 2009. Confronting challenges to e-learning in higher education institutions. *International Journal of Education and Development Using ICT*, 5(3):101–114.
- Mapudzi, H., Chikandiwa, C. & Muteeri, M. 2021. "Chapter Fourteen Re-imagining Teaching and Learning in the Context of the COVID-19 Pandemic: Lessons for African Higher Education Institutions". In *Global Capital's 21st Century Repositioning: Between COVID-19 and the Fourth Industrial Revolution on Africa*, p.315. African Books Collective.
- Mardiah, H. 2020. The use of e-learning to teach English in the time of the Covid-19 pandemic. *English Teaching and Linguistics Journal (ETLiJ)*, 1(2):45–55.

- Mhlanga, E., 2021. Shifting trends in higher education in Sub-Saharan Africa and implications for quality. In *Mediating Learning in Higher Education in Africa* (pp. 174-192). Brill.
- Mhlanga, D., Denhere, V. and Molo, T., 2022. COVID-19 and the Key Digital Transformation Lessons for Higher Education Institutions in South Africa. *Education Sciences*, 12(7), p.464.
- Mncube, V., Mutongoza, B.H. & Olawale, E. 2021. Managing higher education institutions in the context of COVID-19 stringency: Experiences of stakeholders at a rural South African university. *Perspectives in Education*, 39(1):390–409.
- Miles, M.B., Huberman, A.M. & Saldaña, J. 2018. *Qualitative data analysis: A methods sourcebook*. USA: Sage publications.
- Mishra, S.B. & Alok, S. 2022. *Handbook of research methodology*. Educreation.
- Mkandawire, S.B. 2019. Selected common methods and tools for data collection in research. *Selected Readings in Education*, 2:143–153.
- Mncube, L.S. 2022. Domestication of open educational resources by academics in an open distance e-learning institution of South Africa.
- Mncube, V., Mutongoza, B.H. and Olawale, E., 2021. Managing higher education institutions in the context of COVID-19 stringency: Experiences of stakeholders at a rural South African university. *Perspectives in Education*, 39(1), pp.390-409.
- Mohan, A. & D'silva, D.R. 2020. Impact of E-Learning on Higher Education during Covid-19 Pandemic. *Qual Quant.*, 55(3):805–826. doi: 10.1007/s11135-020-01028-z.
- Mohajan, H.K. 2018. Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, 7(1):23–48.
- Mohd Yunus, M.G. 2010. Building an innovation-based economy: The Malaysian technology business incubator experience. *Journal of Change Management*, 3(2):177–188. DOI:10.1080/146970102123656403
- Molotsi, A.M. 2020. The university staff experience of using a virtual learning environment as a platform for e-learning. *Journal of Educational Technology and Online Learning*, 3(2):133–151.
- Mormah, F.O. & Basse, A.B. 2021. Teacher Education in Nigeria and the Emerging Technologies in the 21st-Century Classroom. *African Educational Research Journal*, 9(3):641–647.
- Muir, T., Wang, I., Trimble, A., Mainsbridge, C. & Douglas, T. 2022. Using interactive online pedagogical approaches to promote student engagement. *Education Sciences*, 12(6), p.415.

- Müller, F.A. and Wulf, T., 2021. Blended learning environments that work: An evidence-based instructional design for the delivery of qualitative management modules. *The International Journal of Management Education*, 19(3), p.100530.
- Mapudzi, H., Chikandiwa, C. & Muteeri, M. 2021. Chapter Fourteen Re-imagining Teaching and Learning in the Context of the COVID-19 Pandemic: Lessons for African Higher Education Institutions. *Global Capital's 21st Century Repositioning: Between COVID-19 and the Fourth Industrial Revolution on Africa*, p.315.
- Mpanza, M. 2022. Teaching and Learning in Mining Engineering and Mine Surveying from Face-to-Face to Remote Learning. In INTED2022 Proceedings (pp. 10595–10602). IATED.
- Mpungose, C.B. 2020. Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic. *Humanities and Social Sciences Communications*, 7(1):1–9.
- Mpungose, C.B. 2021. Lecturers' reflections on use of Zoom video conferencing technology for e-learning at a South African university in the context of coronavirus. *African Identities*, 1–17.
- Muzari, T., Shava, G.N. & Shonhiwa, S. 2022. Qualitative Research Paradigm, a Key Research Design for Educational Researchers, Processes and Procedures: A Theoretical Overview. *Indiana Journal of Humanities and Social Sciences*, 3(1):14–20.
- Mzangwa, S.T. 2019. The effects of higher education policy on transformation in post-apartheid South Africa. *Cogent Education*, 6(1).
- Namysova, G., Tussupbekova, G., Helmer, J., Malone, K., Mir, A. & Jonbekova, D. 2019. Challenges and benefits of blended learning in higher education.
- Ngozwana, N. 2018. Ethical dilemmas in qualitative research methodology: Researcher's reflections. *International Journal of Educational Methodology*, 4(1):19–28.
- Nsamba, A. 2019. Maturity levels of student support e-services within an open distance e-learning university. *International Review of Research in Open and Distributed Learning*, 20(4):60–78.
- Obadire, O.S., Mashau, T.S. and Misumi, C., 2020. Understanding Internationalisation of Higher Education in the era of COVID-19. *Gender & Behaviour*, 18(4), pp.16777-16786.

- Oliveira, A., Feyzi Behnagh, R., Ni, L., Mohsinah, A.A., Burgess, K.J. and Guo, L., 2019. Emerging technologies as pedagogical tools for teaching and learning science: A literature review. *Human Behavior and Emerging Technologies*, 1(2), pp.149-160.
- Olivier, B., Jacobs, L., Naidoo, V., Pautz, N., Smith, R., Barnard-Ashton, P., Ajidahun, A.T. and Myezwa, H., 2021. Learning styles in Physiotherapy and Occupational Therapy students: an exploratory study. *South African Journal of Occupational Therapy*, 51(2), pp.39-48.
- Olweny, M.R., Ndibwami, A. & Ahimbisibwe, A. 2022. Online architectural education: Reflections on COVID-19 emergency remote learning in East Africa. *E-Learning and Digital Media*, p.20427530221117329.
- Opie, C., 2019. Research procedures. *Getting Started in Your Educational Research: Design, Data Production and Analysis*, 159, p.p176.
- Owolabi, J.O. 2020. Virtualising the school during COVID-19 and beyond in Africa: infrastructure, pedagogy, resources, assessment, quality assurance, student support system, technology, culture and best practices. *Advances in Medical Education and Practice*, 11:755.
- Oliveira, G., Grenha Teixeira, J., Torres, A. & Morais, C. 2021. An exploratory study on the emergency remote education experience of higher education students and teachers during the COVID-19 pandemic. *British Journal of Educational Technology*, 52(4):1357–1376.
- Önöral, Ö. & Kurtulmus-Yilmaz, S. 2020. Influence of covid-19 pandemic on dental education in Cyprus: Preclinical and clinical implications with e-learning strategies. *Advanced Education*, 7(16):69–77.
- Pal, D. and Vanijja, V., 2020. Perceived usability evaluation of Microsoft Teams as an online learning platform during COVID-19 using system usability scale and technology acceptance model in India. *Children and youth services review*, 119, p.105535.
- Palaskar, J. 2018. Research ethics. *Journal of Dental & Allied Sciences*, 7(1).
- Pallavi, D.R., Ramachandran, M. & Chinnasamy, S. 2022. An Empirical Study On Effectiveness of E-Learning Over Conventional Class Room Learning—A Case Study with Respect to Online Degree Programmes in Higher Education. *Recent trends in Management and Commerce*, 3(1):25–33.
- Penberthy, W.J. 2020. 'Remediation Approaches for the Recovery of Trust after a Privacy Breach at an Educational Institution: An Exploratory Case Study', Northcentral University.

- Perannagari, K.T. & Chakrabarti, S. 2019. Factors influencing acceptance of augmented reality in retail: insights from thematic analysis. *International Journal of Retail & Distribution Management*.
- Peterson, J.S. 2019. Presenting a qualitative study: A reviewer's perspective. *Gifted Child Quarterly*, 63(3):147–158.
- Pietilä, A.M., Nurmi, S.M., Halkoaho, A. & Kyngäs, H. 2020. Qualitative research: Ethical considerations. In Kyngäs, H., Kääriäinen, M. and Elo, S. (eds.). 2020. *The application of content analysis in nursing science research* (pp. 49–69). Springer, Cham.
- Qwabe, B.P. & Khumalo, M. 2020. Students perspective regarding usefulness of e-learning in a South African University of Technology. *International Journal of Entrepreneurship*, 24(2):1–13.
- Raban, M. & Mayisela, T. 2022. Blended learning as a means of opening up learning at Northlink TVET College in South Africa. *Open Learning as a Means of Advancing Social Justice*, 86.
- Radha, R., Mahalakshmi, K., Kumar, V.S. & Saravanakumar, A.R. 2020. E-Learning during lockdown of Covid-19 pandemic: A global perspective. *International journal of control and automation*, 13(4):1088–1099.
- Rahiem, M.D. 2020. The emergency remote learning experience of university students in Indonesia amidst the COVID-19 crisis. *International Journal of Learning, Teaching and Educational Research*, 19(6):1–26.
- Rahm, A.K., Töllner, M., Hubert, M.O., Klein, K., Wehling, C., Sauer, T., Hennemann, H.M., Hein, S., Kender, Z., Günther, J. & Wagenlechner, P. 2021. Effects of realistic e-learning cases on students' learning motivation during COVID-19. *PLoS one*, 16(4):e0249425.
- Raj, S.A.P. 2021. A Comprehensive Study On Learning Styles, E Learning Model And Tools. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(10):2504–2510.
- Ross, P.T. & Bibler Zaidi, N.L. 2019. Limited by our limitations. *Perspectives on medical education*, 8(4):261–264.
- Saad, M.H., Hagelaar, G., van der Velde, G. and Omta, S.W.F., 2021. Conceptualization of SMEs' business resilience: A systematic literature review. *Cogent Business & Management*, 8(1), p.1938347.

- Sarker, M.F.H., Al Mahmud, R., Islam, M.S. & Islam, M.K. 2019. Use of e-learning at higher educational institutions in Bangladesh: Opportunities and challenges. *Journal of Applied Research in Higher Education*.
- Sarikhani, R., Salari, M. & Mansouri, V. 2016. The Impact of E-Learning on University Students' Academic Achievement and Creativity. *Journal of Technical Education and Training*, 8(1):25–33.
- Saiyad, S., Virk, A., Mahajan, R. and Singh, T., 2020. Online teaching in medical training: Establishing good online teaching practices from cumulative experience. *International Journal of Applied and Basic Medical Research*, 10(3), p.149.
- Shah, R.K. 2019. Effective constructivist teaching learning in the classroom. *Shanlax International Journal of Education*, 7(4):1–13.
- Shahi, G.K., Dirkson, A. & Majchrzak, T.A. 2021. An exploratory study of COVID-19 misinformation on Twitter. *Online Social Networks and Media*, 22. Retrieved from: <https://doi.org/10.1016/j.osnem.2020.100104>.
- Siddiqui, S. 2019. Research paradigms: Their assumptions and relevance. *International Journal of Research in Social Sciences*, 9(5):254–265.
- Sileyew, K.J. 2019. Research design and methodology. In Abu-Taieh, E., El Mouatasim A. and Al Hadid, I.H. 2019. *Cyberspace*. (pp. 1–12). Rijeka: IntechOpen.
- Simamora, R.M. 2020. The Challenges of online learning during the COVID-19 pandemic: An essay analysis of performing arts education students. *Studies in Learning and Teaching*, 1(2):86–103.
- Sonn, I.K., Du Plessis, M., Jansen Van Vuuren, C.D., Marais, J., Wagener, E. & Roman, N.V. 2021. Achievements and Challenges for Higher Education during the COVID-19 Pandemic: A Rapid Review of Media in Africa. *International Journal of Environmental Research and Public Health*, 18(24):12888.
- Sundler, A.J., Lindberg, E., Nilsson, C. & Palmér, L. 2019. Qualitative thematic analysis based on descriptive phenomenology. *Nursing Open*, 6(3):733–739.
- Tadesse, S. & Muluye, W. 2020. The impact of COVID-19 pandemic on education system in developing countries: a review. *Open Journal of Social Sciences*, 8(10):159–170.
- Taherdoost, H. 2019. What is the best response scale for survey and questionnaire design; review of different lengths of rating scale/attitude scale/Likert scale. Hamed Taherdoost, pp.1-10.
- Taguchi, N. 2018. Description and explanation of pragmatic development: Quantitative, qualitative, and mixed methods research. *System*, 75:23–32.

- Tejedor, S., Cervi, L., Pérez-Escoda, A., Tusa, F. & Parola, A. 2021. Higher education response in the time of coronavirus: perceptions of teachers and students, and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1):43.
- Tham, J., Duin, A.H., Veeramoothoo, S.C. and Fuglsby, B.J., 2021. Connectivism for writing pedagogy: Strategic networked approaches to promote international collaborations and intercultural learning. *Computers and Composition*, 60, p.102643.
- Tualualelei, E. & McFall-McCaffery, J. 2019. The Pacific research paradigm: opportunities and challenges. *Mai Journal*, 8(2):188–204.
- Turnbull, D., Chugh, R. & Luck, J. 2021. Transitioning to E-Learning during the COVID-19 pandemic: How have Higher Education Institutions responded to the challenge? *Education and Information Technologies*, 26(5):6401–6419.
- Turner, K.L., Hughes, M. & Presland, K. 2020. Learning loss, a potential challenge for transition to undergraduate study following COVID19 school disruption. *Journal of Chemical Education*, 97(9):3346–3352.
- University of the Witwatersrand. 2014. Distance Education Policy. Retrieved from: file:///C:/Users/a0027435/Downloads/Distance_education_policy_2014%20(1).pdf.
- University of the Witwatersrand. 2020. Online Learning and Teaching Policy. Retrieved from: <https://intranet.wits.ac.za/exec/registrar/Policies/Online%20Learning%20and%20Teaching%20Policy.pdf>.
- Vesey, R.P. 2020. *Qualitative research study on practitioners' experiences of connection in the therapeutic encounter*. (Doctoral dissertation, City University of London).
- Wa-Mbaleka, S. 2019. December. Ethics in Qualitative Research: A Practical Guide. In *International Forum Journal*, 22(2):116–132.
- Wan, Z. 2019. Participant Selection and Access in Case Study Research. *Challenges and Opportunities in Qualitative Research*, 47–61.
- Wandasari, Y., Kristiawan, M. & Arafat, Y. 2019. Policy evaluation of school's literacy movement on improving discipline of state high school students. *International Journal of Scientific & Technology Research*, 8(4):190–198.
- Hays, D.G. and McKibben, W.B., 2021. Promoting rigorous research: Generalizability and qualitative research. *Journal of Counseling & Development*, 99(2), pp.178-188.
- Weis, L., 2021. THE FUTURE OF E-LEARNING: DESIGNING SUSTAINABLE EDUCATION __. *Sustainable development in a modern knowledge society*, p.5.

- Wilhelmy, A. and Köhler, T., 2022. Qualitative research in work and organizational psychology journals: Practices and future opportunities. *European Journal of Work and Organizational Psychology*, 31(2), pp.161-185.
- Wu, L., Hsieh, P.J. and Wu, S.M., 2022. Developing effective e-learning environments through e-learning use mediating technology affordance and constructivist learning aspects for performance impacts: Moderator of learner involvement. *The Internet and Higher Education*, 55, p.100871.
- Yastibas, A.E. & Yastibas, G.C. 2015. The use of e-portfolio-based assessment to develop students' self-regulated learning in English language teaching. *Procedia: Social and Behavioral Sciences*, 176:3–13.

APPENDIXES

APPENDIX A: PARTICIPANT INFORMATION

Participant Information

Date:

Title: Health sciences students' perceptions on the effect of e-learning during covid-19 pandemic at the University of Witwatersrand.

DEAR PROSPECTIVE PARTICIPANT

My name is Stephen Mongwe and I am doing research under the supervision of Prof Geesje Van Den BERG and Dr Patience Kelebogile Mudau, a professor and senior lecturer, in the Department of Curriculum studies towards a MEd in Open and Distance Learning at the University of South Africa. I have funding from University of the Witwatersrand for staff members. I am inviting you to participate in a study entitled Health sciences students' perceptions on the effect of e-learning during covid-19 pandemic at the University of Witwatersrand. This study is expected to collect important information that could identify the educational sector's strengths and weaknesses one-learning so that flaws and opportunities may be highlighted. This study will also make recommendations to Wits University on how to address major difficulties faced by South African institutions of higher learning on the issue of implementing e-learning during COVID 19 or in a crisis that needs learners not to attend physical classes.

You are invited because as a health sciences student, your information is valuable, and I am inviting you to participate as a key informant.

I obtained your contact details from the International Students Office Manager and the Health Sciences Faculty after obtaining ethics approval from the University of the Witwatersrand Deputy Faculty Registrar. To conduct research and collect data, this research will employ an online questionnaire with open ended questions. As a result, I will send you an online questionnaire, please keep in mind that participating in the online process signifies that you have agreed to participate in the study. Questionnaire will be distributed through emails, I will communicate with administrators of your schools to send out emails with surveys to complete.

Questions in the online questionnaire will be on the effect of e-learning during COVID-19 pandemic at the University of Witwatersrand. The interview will be saved in the Google forms and analysis later. The questionnaire will take about 30-60 minutes of your time.

You will not receive any direct benefits from this study and there are no consequences or disadvantages of not participating in the study. Your name will not be recorded anywhere and that no one, apart from the researcher and identified members of the research team, will know about your involvement in this research. Your answers will be given a code number, or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. Hard copies will be stored safely in the researcher's home in a locked cardboard. All data collected during the study will be securely retained for six (6) years as there is no publication. Thereafter it will be destroyed accordingly. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. Indicate how information will be destroyed if necessary. Hard copies will be shredded and/or electronic copies will be permanently deleted from the hard drive of the computer. Your participation is voluntary and that you are free to withdraw at any time without penalty.

If you would like to be informed of the final research findings, please contact Stephen Mongwe on 011 747 0454 (077 050 0014) or smongwe@wits.ac.za

APPENDIX B: CONSENT FORMS

Consent form

CONSENT/ASSENT TO PARTICIPATE IN THIS STUDY (Return slip)

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the interview/online questionnaire.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname (please print) _____

Participant Signature

Date

Researcher's Name & Surname (please print) _____

Researcher's signature

Date

APPENDIX C: DECLARATION LETTER TO HEALTH SCIENCES ETHICS COMMITTEE

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



HUMAN RESEARCH ETHICS
COMMITTEE (MEDICAL)

DECLARATION:

Adherence to HREC (Medical) Ethics Application Terms and Conditions

I, the undersigned, hereby declare that I have not collected data/ done secondary data analysis or any other form of research, prior to obtaining clearance certificate from the HREC (Medical) for study no:

_____ .

I have read and understood the terms and conditions on section 9 of [HREC \(Medical\) application form](#). I confirm that it is my responsibility to ensure that I have received final HREC (Medical) Clearance before commencing any research.

Stephen Mongwe

Handwritten signature of Stephen Mongwe in black ink.

Name, Surname and Signature

Student/Staff no if applicable: **A0027435 (Wits Staff number)**

Date: **25 July 2022**

Prof Patience Kelebogile Mudau

Handwritten signature of Prof Patience Kelebogile Mudau in black ink.

Name, Surname and Signature

Supervisor (if applicable)

Date: **25 July 2022**

APPENDIX D: LETTER TO WITS DEPUTY REGISTRAR REQUESTING CLEARANCE

21 June 2022

Mrs Nicoleen Potgieter
Deputy Registrar – University of the Witwatersrand
1 Jan Smuts Avenue,
Braamfontein
Tel: (011) 717 2451

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN WITS UNIVERSITY

Dear Mrs Potgieter

My name is Stephen Mongwe, and I am a Master of Education in Open and Distance Learning student at the University of South Africa. The research I wish to conduct for my Master of Education in Open and Distance Learning involves Health sciences students' perceptions on the effect of e-learning during covid-19 pandemic at the University of Witwatersrand. This project will be conducted under the supervision of Prof Geesje Van Den BERG and Dr Patience Kelebogile Mudau - UNISA.

I am hereby seeking your consent to approach several students in the health sciences faculty to provide participants for this project. I have provided you with a copy of my proposal which includes copies of the measure and consent and assent forms to be used in the research process, as well as a copy of the approval letter which I received from the University of South Africa Research Ethics Committee. Upon completion of the study, I undertake to provide the Department of Education with a bound copy of the full research report.

If you require any further information, please do not hesitate to contact me on Stephen Mongwe, 076 950 0911, stephen.mongwe@wits.ac.za/39428810@mvlife.unisa.ac.za.

Thank you for your time and consideration in this matter.

Yours sincerely,

Stephen Mongwe (UNISA student and University of the Witwatersrand employee)

Signature:

APPENDIX E: ONLINE QUESTIONNAIRE

Appendix A: Online questionnaire

SECTION A DEMOGRAPHIC INFORMATION

Information provided will be kept confidential and used purely for the purpose of the research.

1. Research Code _____

2. Gender (please tick the appropriate box)

Male	
Female	

3. Age of student (please tick the appropriate box)

18 – 24 years	
25 – 30 years	
30 – 39 years	
40 – 49 years	
50 – years+	

4. Level of study (please tick the appropriate box)

Undergraduate	
Postgraduate	

5. Year of study (1st, 2nd, 3rd & 4th) _____

5. Place of attendance (please tick the appropriate box)

Urban	
Rural	

Section B: Health sciences students' perceptions on the effect of e-learning during covid-19 pandemic at the University of Witwatersrand

1. What influence did e-learning have on Health Sciences students at university of Witwatersrand during Covid-19?
2. Which available support/technologies for e-learning platforms were available to Health Sciences students?
3. How did the measures taken by the University of Witwatersrand, to support Health Sciences students assist in implementing e-learning?
4. What e-learning possibilities did the University of Witwatersrand's Health Sciences students have during COVID 19?
5. How would you describe your fulfilment with e-learning during a pandemic?
6. What aspects of e-learning most affect your satisfaction?
7. If you had the opportunity, what would you most like to change from the current setup on e-learning?
8. What would you not change about this setup under any circumstances?

Any additional comments on rewards/benefits offered by e-learning during COVID 19

APPENDIX F: ETHICS CLEARANCE TRAINING CERTIFICATE



TRREE

Zertifikat Certificat

Certificado Certificate

Promouvoir les plus hauts standards éthiques dans la protection des participants à la recherche biomédicale
Promoting the highest ethical standards in the protection of biomedical research participants

Certificat de formation - Training Certificate
Ce document atteste que - this document certifies that

Stephen Mongwe

a complété avec succès - has successfully completed

Introduction to Research Ethics

du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation



Clinical Trials Centre
The University of Hong Kong



Professeur Dominique Sprumont
Coordinateur TRREE Coordinator

Release Date: 2022/07/06
cid : a7m7m0e7v

APPROVED BY
SIWF FMH ISFM
Programmes de formation continue (C. cr666a)
Continuing Education Programs (C. cr666a)

Foederatio
Pharmaceutica
Helvetiae
FPH
Programmes de formation
postgraduée et continue

Ce programme est soutenu par - This program is supported by :
European and Developing Countries Clinical Trials Partnership (EDCTP) (www.edctp.org) - Swiss National Science Foundation (www.snf.ch) - Canadian Institutes of Health Research (http://www.cihr-irac.gc.ca/2891.html) -
Swiss Academy of Medical Sciences (SAMS/ASSM/SAMW) (www.sams.ch) - Consortium for Research Partnerships with Developing Countries (www.fph.ch)

[REV : 20200117]

APPENDIX G: UNISA ETHICS CLEARANCE CERTIFICATE



UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2022/07/06

Ref: 2022/07/06/39426610/24/AM

Dear Mr S Mongwe

Name: Mr S Mongwe

Student No.:39426610

Decision: Ethics Approval from
2022/07/06 to 2025/07/06

Researcher(s): Name: Mr S Mongwe
E-mail address: mudaupk@unisa.ac.za
Telephone: 0124298898

Supervisor(s): Name: Prof G Van Den Berg
E-mail address: vdberg@unisa.ac.za
Telephone: 012 429 4895

Name: Prof PK Mudau
E-mail address: mudaupk@unisa.ac.za
Telephone: 0124298898

Title of research:

Health sciences students' perceptions on the effect of e-learning during COVID-19 pandemic at the University of Witwatersrand

Qualification: Med Open and Distance Learning

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2022/07/06 to 2025/07/06.

The medium risk application was reviewed by the Ethics Review Committee on 2022/07/06 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.



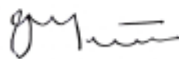
University of South Africa
Pretorius Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date **2025/07/06**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number 2022/07/06/39426610/24/AM should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Kind regards,



Prof AT Motlhabane
CHAIRPERSON: CEDU RERC
motlhat@unisa.ac.za



Prof Mpine Makoe
ACTING EXECUTIVE DEAN
qakisme@unisa.ac.za



Approved - decision template – updated 16 Feb 2017

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA, 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

APPENDIX H: HEALTH SCIENCES ETHICS CLEARANCE CERTIFICATE



R14/49 Mr Stephen Mongwe

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M220685

NAME: Mr Stephen Mongwe
(Principal Investigator)

DEPARTMENT: University of South Africa
University of the Witwatersrand, Faculty of Health Sciences

PROJECT TITLE: *Health sciences students' perceptions on the effect of e-learning during COVID-19 pandemic at the University of Witwatersrand*

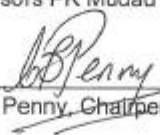
DATE CONSIDERED: Ad hoc

DECISION: Approved unconditionally

CONDITIONS:

NOTE: If contact information regarding student study participants is required, please contact the Registrar's office - <Nicoleen.Potgieter@wits.ac.za>

SUPERVISOR: Professors PK Mudau and G Van Den Berg

APPROVED BY: 
Dr CB Penny, Chairperson, HREC (Medical)

DATE OF APPROVAL: 26/07/2022

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the Third Floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report.** The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **July** and will therefore be due in the month of **July** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX I: ETHICS CLEARANCE CERTIFICATE FROM WITS DEPUTY REGISTRAR



OFFICE OF THE DEPUTY REGISTRAR

31 July 2022

Stephen Mongwe
Master of Education in Open Distance Learning
University of South Africa

TO WHOM IT MAY CONCERN

“Health sciences students’ perceptions on the effect of e-learning during COVID-19 pandemic at the University of Witwatersrand.”

This letter serves to confirm that the above project has received permission to be conducted on University premises, and/or involving staff and/or students of the University as research participants. In undertaking this research, you agree to abide by all University regulations for conducting research on campus and to respect participants’ rights to withdraw from participation at any time.

If you are conducting research on certain student cohorts, year groups or courses within specific Schools and within the teaching term, permission must be sought from Heads of School or individual academics.

Ethical clearance has been obtained. (Protocol number: M220685)

Research Expiration: (26 July 2027)

A handwritten signature in black ink that reads 'Potgieter' with a stylized initial 'N'.

Nicoleen Potgieter
University Deputy Registrar