

https://dspace.org/

A Digital Capability Framework for Academic Continuity amongst South African Higher Education Students

Makgopela, Reitumetse Ogorogile

2023
University of the Witswatersrand, Johannesburg
https://hdl.handle.net/10539/38574

Downloaded from a DSpace repository. https://dspace.org/



A Digital Capability Framework for Academic Continuity amongst South African Higher Education Students

Reitumetse Ogorogile Makgopela

Student Number: 1762358

School of Business Sciences

University of Witwatersrand
Johannesburg, South Africa.

Supervisor: Dr Thembekile Mayayise

A research Report submitted to the Faculty of Commerce, Law and Management, University of Witwatersrand, in fulfilment of the requirements for the degree of Master of Commerce in Information Systems.

PLAGIARISM DECLARATION

Surname: **Makgopela** First Name: **Reitumetse** Student No: **1762358**

Course Name: **Information Systems** 50% Research Report: **Master of Commerce**

Plagiarism is "the failure to acknowledge the ideas or writing of another" or "presentation of the idea or writing of another as one's own" and should be read to cover intentional and unintentional failure to acknowledge the ideas of others. In this context "others" means any other person including a student, academic, professional, published author or other resource such as the internet. The University of the Witwatersrand, Johannesburg believes that failing to acknowledge the use of ideas of others constitutes an important breach of the values and conventions of the academic enterprise. It has therefore been resolved that al students should be required to sign a declaration that they are aware that they are required to submit their own unaided work and that plagiarism is unacceptable.

I declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and or without acknowledging the original source) is wrong;
- I am aware that any work that I submit for assessment must be my own unaided work except where I have explicitly indicated otherwise;
- I am aware that I must follow the required conventions in referencing the thoughts and ideas of others;
- I understand that the University of the Witwatersrand may take disciplinary action against me if I do not submit my own unaided work or if I fail to acknowledge the ideas or words of someone else in my writing and that lecturers are obliged to report incidents of plagiarism;

I have read and understood the above plagiarism declaration and confirm that any work submitted will be entirely my own except where otherwise acknowledged.

Signature:  **Date: 28 February 2023**

ACKNOWLEDGEMENTS

The completion of this undertaking could have not been possible without the participation and assistance of so many persons whose names may not all be enumerated. However, I would like to express my deepest appreciation and indebtedness to the following:

My sincerest gratitude to my supervisor, Dr Thembekile Mayayise, for her patience, guidance and support, who without failure availed herself to provide guidance and constructive feedback which encouraged me to push through with this undertaking.

To all the participants of this study who were kind enough to take time to share their experiences, I thank and appreciate you. This study would not even exist without you.

To my three “mothers”, Mickey Makgopela, Matibane Moeketsi and Christine Mutnikas, I am extremely grateful for your unconditional love, patience and support you have shown me over the years and especially with getting this over the line. Words fail me, I love you!

I also wish to express my gratitude to Unbroken Ministries for their fellowship and counsel. Your prayers and words of encouragement carried me through.

To my “homies”, the rest of my family, classmates, and colleagues, thank you for accommodating my schedule, for the study snacks, the chill sessions and for having my back.

Above all, to God almighty, the ultimate author of all things and of my life, who showered me with love and lots of grace and showed me that indeed, I can do all things through him.

Thank you!

A Digital Capability Framework for Academic Continuity amongst South African Higher Education Students

Reitumetse Makgopela – 1762358

INFO7006A - Research Report

ABSTRACT

E-learning has been designated as a solution to academic continuity as a response to the COVID-19 pandemic, which has resulted in the closure of institutions such as Higher Education Institutions (HEIs). The use of e-learning by Higher Education (HE) students in developing countries have been extensively studied; however, studies on e-learning use, more specifically effective use for academic continuity in the context of unprecedented circumstances such as natural disasters and pandemics remain scarce. Understanding the effective use of e-learning during such times is a vital step in enabling South African HE students to attain their educational achievements. The definition of e-learning used in this paper was consistent with the one provided by Rosenberg (2001) who refers to e-learning as a learning platform accessed by students and instructors, specifically via the internet. The purpose of this study was to explore and describe the effective use of e-learning during unprecedented circumstances to conceptualise a digital capability framework for academic continuity amongst South African HE students. This was an interpretivist study which employed qualitative methods consisting of semi-structured interviews for data collection and thematic analysis for data analysis of the data extracted from 12 students, both undergraduate and postgraduate, registered in any South African HE who used e-learning as the primary method for education where traditional face-to-face classroom learning was not available. The conceptual research framework presented in this paper was an adaptation of Sen's Capability Approach and expands on personal, social and environmental conversion factors by introducing a fourth category extracted from the results from the systematic literature review findings referred to as "technological conversion factors"; which brought a new and exciting contribution to the theory itself. Finally, the outcome of the study was a conceptualised digital capability framework for academic continuity amongst South African HE students in the context of similar circumstances, which can be used to describe how students can use e-learning effectively in terms of resources, e-learning systems, information delivered and location. It further detailed the enablers and hinderances to the effective use thereof. The framework can also be used in practice by HEIs, students, policy makers, e-learning vendors, and developers as a checklist of key elements which need to be considered in e-learning strategies, programmes and development.

KEYWORDS A*cademic continuity*, c*apability approach, challenges, e-learning, effective use, higher education students, unprecedented, South Africa*

TABLE OF CONTENTS

LIST OF FIGURES ix
LIST OF TABLES x
ACRONYMS xi
CHAPTER 1 1
1 INTRODUCTION 1
1.1 CONTEXT AND BACKGROUND 1
1.2 PROBLEM STATEMENT 2
1.3 AIMS AND OBJECTIVES OF STUDY 3
1.4 RESEARCH QUESTIONS 4
1.5 DELIMITATIONS AND ASSUMPTIONS 4
1.6 STRUCTURE OF REPORT 5
CHAPTER 2 6
2 LITERATURE REVIEW 6
2.1 INTRODUCTION 6
2.2 THE USE OF E-LEARNING IN HEIs IN DEVELOPING COUNTRIES 8
2.2.1 E-learning Types 8
2.2.2 Information Delivered 9
2.2.3 Devices 9
2.2.4 Driver of Usage 9
2.2.5 Learning Environment 10
2.3 THE INFLUENCE OF PERSONAL, SOCIAL, ENVIRONMENTAL AND TECHNOLOGICAL FACTORS ON THE USE OF E-LEARNING 10
2.3.1 Personal Factors 10
2.3.2 Social Factors 13
2.3.3 Environmental Factors 14
2.3.4 Technological Factors 16
2.4 CHALLENGES THAT HINDER THE SUCCESS OF E-LEARNING IN HEIs WITHIN THE CONTEXT OF DEVELOPING COUNTRIES (INFRASTRUCTURAL, INSTITUTIONAL, INDIVIDUAL AND SOCIETAL CHALLENGES) 18
2.4.1 Infrastructural Challenges 19
2.4.2 Institutional Challenges 21
2.4.3 Individual Challenges 23
2.4.4 Societal Challenges 26
2.5 SUMMARY GAPS IN THE LITERATURE 27

2.5.1 Theoretical Knowledge Gap 27
2.5.2 Methodological Knowledge Gap 28
2.5.3 Practical Knowledge Gap 28
2.5.4 Contextual Knowledge Gap 31
CHAPTER 3 32
3 THEORETICAL BACKGROUND AND CONCEPTUAL RESEARCH FRAMEWORK 32
3.1 INTRODUCTION 32
3.2 THEORIES IN SYSTEM ACCEPTANCE AND USAGE 32
3.3 THEORETICAL UNDERPINNINGS 35
3.3.1 Functionings and Capabilities 36
3.3.2 Well-Being and Agency 36
3.3.3 Commodities and Conversion Factors 36
3.4 CONCEPTUAL RESEARCH FRAMEWORK 37
3.4.1 Key Concepts of Proposed Framework 38
CHAPTER 4 46
4 RESEARCH METHODOLOGY 46
4.1 INTRODUCTION 46
4.2 SLR METHODOLOGY 46
4.3 RESEARCH PARADIGM AND APPROACH 46
4.4 RESEARCH STRATEGY 48
4.5 RESEARCH DESIGN 49
4.5.1 Unit of Analysis 49
4.5.2 Time Horizon 49
4.5.3 Case Selection/Sampling 49
4.5.4 Data Collection Methods 50
4.6 DATA ANALYSIS 53
4.7 RIGOUR 55
4.7.1 Dependability 55
4.7.2 Credibility 55
4.7.3 Confirmability 56
4.7.4 Transferability 56
4.8 ETHICAL CONSIDERATIONS 56
CHAPTER 5 57
5 FINDINGS 57
5.1 DATA COLLECTED – SEMI-STRUCTURED INTERVIEWS 57
5.1.1 Participant Background Questions 43
5.1.2 Resource/Commodity (e-learning system) Questions 43

5.1.3 Factors Enabling and Hindering the Effective Use of E-Learning Questions 44
5.1.4 Conversion Factors Questions 44
5.2 PARTICIPANT BACKGROUND 57
5.3 RESOURCE/COMMODITY (E-LEARNING SYSTEM) 59
5.3.1 Which e-learning System do you use at your Higher Education Institution? 59
5.3.2 How do you access the E-Learning System? Which resources do you use? 61
5.3.3 When do you use e-learning? 63
5.3.4 What kind of information is delivered through e-learning platforms? 65
5.3.5 From which location/setting do you access it? 67
5.4 CONVERSION FACTORS 68
5.4.1 Personal Conversion Factors 69
5.4.2 Social Conversion Factors 73
5.4.3 Environmental Conversion Factors 77
5.4.4 Technological Conversion Factors 82
5.5 FACTORS HINDERING AND ENABLING THE EFFECTIVE USE OF E-LEARNING 87
5.5.1 What are the factors you believe hinder the effective use of e-learning? 87
5.5.2 What are the factors you believe enable the effective use of e-learning? 95
5.6 SUMMARY OF FINDINGS 102
CHAPTER 6 105
6 DISCUSSION OF FINDINGS 105
6.1 PARTICIPANT BACKGROUND 105
6.2 THE USE OF E-LEARNING SYSTEMS BY SOUTH AFRICAN HE STUDENTS 106
6.2.1 E-learning Systems used at HEIs 107
6.2.2 Resources Required to Access E-Learning Systems 107
6.2.3 Schedule of Using E-Learning 109
6.2.4 Types of Information or Content Delivered Through E-Learning 109
6.2.5 Learning Location or Setting 110
6.3 THE INFLUENCE OF PERSONAL, SOCIAL, ENVIRONMENTAL AND TECHNOLOGICAL CONVERSION FACTORS ON THE EFFECTIVE USE OF E-LEARNING 111
6.3.1 Personal Conversation Factors 111
6.3.2 Social Conversion Factors 114
6.3.3 Environmental Conversion Factors 118
6.3.4 Technological Conversion Factors 121
6.4 FACTORS HINDERING AND ENABLING THE EFFECTIVE USE OF E-LEARNING 125
6.4.1 Infrastructural Factors 125
6.4.2 Institutional Factors 129
6.4.3 Individual Factors 131

6.4.4 Societal Factors 132
6.5 A DIGITAL CAPABILITY FRAMEWORK FOR ACADEMIC CONTINUITY AMONGST SOUTH AFRICAN HIGHER EDUCATION STUDENTS 134
CHAPTER 7 136
7 SUMMARY AND CONCLUSION 136
7.1 RESEARCH QUESTIONS 136
7.1.1 RQ 1: How Do South African He Students Use E-Learning? 136
7.1.2 RQ 2: How Do Personal, Social, Environmental, and Technological Conversion Factors Influence The Effective Use Of E-Learning? 137
7.1.3 RQ 3: How Is The Effective Use Of E-Learning By South African HE Students Hindered And Enabled? 137
7.2 THEORETICAL AND PRACTICAL CONTRIBUTION 137
7.2.1 THEORETICAL CONTRIBUTIONS 137
7.1.2 CONTRIBUTIONS TO PRACTICE 138
7.3 LIMITATIONS OF THE STUDY 140
7.4 RECOMMENDATIONS FOR FUTURE RESEARCH 141
REFERENCES 142
8 APPENDIX A: SLR METHODOLOGY 149
8.1 SLR METHODOLOGY 149
8.1.1 Factors Influencing The Use of E-Learning by Students in HEIs in Developing Countries 149
8.1.2 Challenges that hinder the success of e-learning in HEIs within the context of developing countries 151
9 APPENDIX B: INTERVIEW PROTOCOL 154
10 APPENDIX C: SAMPLE TRANSCRIPT 155
11 APPENDIX D: ETHICS CLEARANCE CERTIFICATE 164
12 APPENDIX E: INFORMATION PARTICIPATION LETTER 165
13 APPENDIX F: CONSENT FORM 166
14 APPENDIX G: TURNITIN REPORT 167

LIST OF FIGURES

Figure 1: Conceptual Research Framework 38
Figure 2: E-learning Systems used at HEIs 60
Figure 3: Resources used in E-learning 61
Figure 4: E-learning Schedule 63
Figure 5: Information Delivered Through E-learning 65
Figure 6: E-learning Location 67
Figure 7: Categories of Conversion Factors Influencing the Effective use of E-learning 69
Figure 8: Personal Conversion Factors Influencing the Effective use of E-learning 70
Figure 9: Social Conversion Factors Influencing the Effective use of E-learning 73
Figure 10: Environmental Conversion Factors Influencing the Effective use of E-learning 78
Figure 11: Technological Conversion Factors Influencing the Effective use of E-learning 82
Figure 12: Categories of Factors Hindering the Effective use of E-learning 87
Figure 13: Infrastructural Challenges Hindering the Effective Use of E-learning 88
Figure 14: Institutional Challenges Hindering the Effective Use of E-learning 91
Figure 15: Individual Challenges Hindering the Effective Use of E-learning 93
Figure 16: Societal Challenges Hindering the Effective Use of E-learning 94
Figure 17: Categories of Factors Enabling the Effective use of e-learning 95
Figure 18: Infrastructural Factors Enabling the Effective Use of E-learning 96
Figure 19: Institutional Factors Enabling the Effective Use of E-learning 98
Figure 20: Individual Factors Enabling the Effective Use of E-learning 100
Figure 21: Societal Factors Enabling the Effective Use of E-learning 102
Figure 22: A Digital Capability Framework for Academic Continuity amongst South African Higher Education Students 135

LIST OF TABLES

Table 1: Theoretical Models used in SLR Studies 27
Table 2: Selected Studies for factors influencing e-learning SLR 29
Table 3: Selected Studies for e-learning challenges in HEIs SLR 29
Table 4: Personal Conversion Factors 40
Table 5: Social Conversion Factors 41
Table 6: Environmental Factors 41
Table 7: Technological Conversion Factors 42
Table 8: Interview Questions Breakdown 57
Table 9: Conversion Factors and Questions 44
Table 10: Participant Background Information 58

ACRONYMS

e-learning	Electronic Learning
SA	South Africa
HEI	Higher Education Institution
HE	Higher Education
CA	Capabilities Approach

CHAPTER 1

1 INTRODUCTION

This chapter introduces the research, a study exploring and describing factors influencing the effective use of e-learning for academic continuity amongst South African HE students. The chapter provides context and background to the field of study and the motivation for the research.

1.1 CONTEXT AND BACKGROUND

In March 2020 the World Health Organization (WHO) declared the novel Coronavirus known as COVID-19 as a pandemic due to the severity and rapid spread of the virus globally (WHO, 2020). To curb the spread of this virus, an appeal was announced for people to maintain a deliberate physical and social distance by reducing close contact with each other (Red Cross, 2020). These social distancing regulations forced the physical closure of all business, sports and recreational, social and academic activities; propelling these industries to find non-physical platforms to continue their operations. Amongst these closures were educational institutions such as Higher Education Institutions (HEIs), prompting UNESCO (2020) to caution on the adverse repercussions such closures have on students' opportunities for growth and development. Electronic learning (e-learning) was subsequently designated as a solution for academic continuity in response to this closure crisis (Almaiah et al., 2020). Consequently, in this study, digital capability and/or e-learning are argued as ways for ensuring academic continuity among higher education (HE) students. The notion of unprecedented times referenced in this paper has is consistent with the potential meanings presented by Major (2020) of novel or unparalleled or extraordinary or uncommon, which is the context the pandemic has presented. Furthermore, the definition of e-learning used in this paper is consistent with the one provided by Rosenberg (2001) who refers to e-learning as a learning platform accessed by students and instructors, specifically via the internet. This is also comparable with the definition by Arbaugh (2002), who describes e-learning as the utilisation of the internet as a mechanism to facilitate and distribute learning content. Furthermore, the IT platform or tool whereby e-learning is delivered or facilitated is referred to as Learning Management Systems (LMS), which, according to Lonn and Teasley (2009), is a web-based system which facilitates education without being limited by time and place. It further facilitates the interactions between lecturers and students as well as the distribution of information and resources.

According to Charoen (2009), e-learning was formulated to establish an operative learning environment where the dissemination of knowledge between teachers and students could be increased in a conducive manner. Sharma et al. (2017) note that the success of e-learning systems relies on the usage and acceptance thereof by both instructors and students, which is one of the primary drivers of return on investments the HEIs can make on the systems. Furthermore, while HEIs in developed countries have been successful in reaping the benefits of e-learning for quite a while now, HEIs in developing countries on the other hand, have not fully materialised the benefits of e-learning due to numerous complications and challenges (Ansong et al., 2017; Koponen et al., 2011). Ozkan and Koseler (2009) indicate that the key stakeholders in the e-learning environment are: students, faculty, employers, administrators, and technical staff; and understanding the challenges they experience is an important aspect of the success thereof (Basahel & Basahel, 2018). Thus, these challenges must be understood and eradicated to start reaping the benefits of e-learning (Andersson, 2008).

1.2 PROBLEM STATEMENT

. E-learning has been designated as a solution to academic continuity, notably in situations where the traditional face-to-face learning model is not applicable (Almaiah et al., 2020). The COVID-19 pandemic has enforced stringent social distancing restrictions, resulting in the closure of academic institutions (Red Cross, 2020; UNESCO, 2020). The success of e-learning systems relies on the usage and acceptance thereof and is influenced by behavioural intention; self-efficacy; behavioural control; user satisfaction; attitude towards use; performance expectancy; habit; experience; motivation; student capabilities; adaptation; ICT skills and knowledge; social influence; government support; facilitating conditions; transformational leadership; instructor qualities and behaviour; teacher role; management support; learning environment; service quality; technical support; course assessment; course content support; course design; usability; effort expectancy; relative advantage; compatibility; curriculum needs; information quality; system quality; and collaboration quality (Abbad, 2021; Ain et al., 2016; Aldholay et al., 2018; Ali et al., 2018; Almaiah & Alyoussef, 2019; Al-Mamary, 2022; Alshammari, 2020; Alshehri et al., 2019; Amin & Zaman, 2021; Binyamin et al., 2017; Buabeng-Andoh & Baah, 2019; Cidral et al., 2018; Gurban & Almogren, 2022; Manjeese, 2022; Mohammadi, 2015; Raza et al., 2020; Twinamasiko et al. 2021; Yakubu & Dasuki, 2018). In addition, despite the value of e-learning, there are however challenges such as inadequate ICT infrastructure; internet connectivity-related issues; electricity outages; inadequate computer laboratories; poor learning home environments; financial constraints; lack of stakeholder collaboration; e-learning course administration issues; copyright

issues; operational e-learning policies, standards, and guidelines issues; inadequate technical support; lack of trust and privacy; contextual challenges; resistance to change; lack of awareness; workload management issues; limited ICT skills and training; lack of social presence and support; health issues; lack of access to e-learning resources; cultural challenges; language barrier; and political issues (Aboagye et al., 2021; Adnan & Anwar, 2020; Al-Azawei et al., 2016; Basahel & Basahel, 2018; Bishnoi & Suraj, 2020; Chung et al., 2020; Egielewa et al., 2021; Henaku, 2020; Idris & Osman, 2015; Kaisara & Bwalya, 2021; Karkar et al., 2020; Moakofhi et al., 2017; Mohammadi et al., 2021; Mushtaque et al., 2021; Mutisya & Makokha, 2016; Narh et al., 2019; Rotas & Cahapay, 2020; Selvanathan et al., 2020; Tarus et al., 2015; Twinamasiko et al., 2021; Vershitskaya et al., 2020; Yakubu & Dasuki, 2021). These challenges may impede the realisation of the benefits such as cost-effectiveness; convenience; flexibility; increased accessibility; personalisation of learning; improved quality of information; content standardisation; and many others which cannot always be achieved in the traditional physical classroom environment (Ansong et al., 2017; Bhuasiri et al., 2012; Charoen, 2009; Khan et al., 2012; Koponen et al., 2011; Nwana, 2012; Sung & Mayer, 2012). Based on the literature reviewed, the findings do not adequately address these influencing factors and hindering challenges in the context where e-learning is taking place for academic continuity purposes nor does it address them within the scope of South Africa specifically, see Table 2 and Table 3, respectively. This is specifically crucial in the context of South Africa where e-learning has been selected as a solution to academic continuity as a result of the closure of HEIs under the Disaster Management Act 57 of 2002. Furthermore, the factors and challenges recorded, focus on usage in a functional sense and not necessarily on whether or not that function aids students in their learning process in a manner that empowers them to achieve their desired educational goals, specifically effective usage (Burton-Jones & Grange, 2013). On this point, this study seeks to describe the factors influencing effective e-learning for academic continuity amongst South African HE students.

1.3 AIMS AND OBJECTIVES OF STUDY

The purpose of this study is to explore and describe factors influencing effective e-learning for academic continuity amongst South African HE students.

The goal of this study is to conceptualise a digital capability framework for effective e-learning amongst South African HE students, hence the objectives of this study are to:

- Describe the use of e-learning by South African HE students.

- Describe how personal, social, environmental and technological conversion factors influence effective e-learning for academic continuity in a developing country's context; and
- Describe factors hindering and enabling the effective use of e-learning by South African HE students.

1.4 RESEARCH QUESTIONS

The overarching research question that this study seeks to answer is:

How does e-learning effectively assist SA HE students for academic continuity?

The secondary research questions are:

- *How do South African HE students use e-learning?*
- *How do personal, social, environmental, and technological conversion factors influence the effective use of e-learning?*
- *How does the use of e-learning hinder and enable South African HE students?*

1.5 DELIMITATIONS AND ASSUMPTIONS

- This study will not focus on the intricacies and the specific functionalities of e-learning systems but rather the views, opinions and experiences with the use thereof;
- This study will only focus on South African HE students as the unit of analysis (individual level) and does not include lecturers and other stakeholders nor does it explore at an organizational level;
- The study will cover both undergraduate and postgraduate students registered in any HE in South Africa, not restricted to one HE in particular nor limited to South African nationals only;
- This study focuses on where e-learning was used as the primary mode for education during non-contract classroom learning and argued as a manner of facilitating academic continuity;
- The modes of e-learning used in this study are those platforms or systems which are accessed by students and instructors, exclusively via the internet in line with the definition of e-learning provided by Rosenberg (2001).

1.6 STRUCTURE OF REPORT

This report is structured as follows:

- Chapter 1 introduces the context and background of the field of study and the motivation for the research.
- Chapter 2 presents the literature review as well as a synthesis of findings from two distinct systematic literature reviews (SLRs) on the factors influencing the use of e-learning by students in HEs in developing countries; and e-learning challenges in developing countries. Subsequently, the identified research gaps are presented, providing background to the research problem.
- Chapter 3 discusses and presents the theoretical background and conceptual research framework of this study.
- Chapter 4 contains the research methodology consisting of the SLR methodology, research paradigm, approach, strategy, and design which provides an overview of data collection and analysis methods. Thereafter, criteria of how the rigour of the study is evaluated are provided; followed by a detailed description of the ethical considerations observed.
- Chapter 5 depicts the analysis and findings.
- Chapter 6 presents a detailed discussion of the findings and presents the conceptualised digital capability framework for academic continuity amongst South African HE students in the context of unprecedented circumstances.
- Chapter 7 concludes with depicted of the research questions, the theoretical and practical contributions are presented, followed by the limitations of the study, and finally, recommendations for future research are outlined.

CHAPTER 2

2 LITERATURE REVIEW

This chapter presents the literature and a synthesis of findings from a SLR with two different branches of research that were conducted for this study. The one branch of the SLR incorporates the results on the factors which influence the use of e-learning by students in HEIs in developing countries are presented in two sections: the use of e-learning in HEIs in developing countries; and the influence of personal, social, environmental and technological factors on the use of e-learning. The second branch of the SLR incorporates a synthesis of findings on e-learning challenges in developing countries is presented; followed by the identified research gaps, providing background to the research problem.

2.1 INTRODUCTION

The systematic review protocols followed in this paper were guided by Okoli and Schabram (2010) who outline the process of producing a research literature review that is systematic, explicit, comprehensive, and reproducible. The first branch of the SLR was conducted to provide an overview of the evidence on the existing body of knowledge consistent with the objective of the study which aims to describe how personal, social, environmental, and technological conversion factors influence effective e-learning for academic continuity in a developing country's context. In addition, the second branch of the SLR was conducted to align with the objective of the study which aims to describe the challenges, and factors hindering the effective use of e-learning by South African HE students. The electronic databases searched are the Association for Information Systems (AIS) eLibrary; Education Resources Information Center (ERIC); Journal of Educational Technology Systems (ETS); EBSCO (Academic Search Ultimate, Computers & Applied Sciences Complete, Education Research Complete and Teacher Reference Centre); IEEE Xplore; ScienceDirect; and SpringerLink. The search date ranged from 2015 to 2022, anything that fell outside of that range was excluded. Please refer to Appendix A for a detailed description of the protocol followed for the SLR.

2.2 E-LEARNING

Electronic learning or e-learning signifies to any method of learning which is facilitated or delivered through electronic mediums. E-learning has been synonymously used with online education/learning, web or internet based learning and training, distributed learning and is often used interchangeably (Abdellatief, 2011; Selim, 2007). These electronic mediums range from (not

limited to) internet, intranets, extranets, audio, video, satellite transmission, television, CD-ROM, mobile and wireless technologies (Abdellatief, 2011; Nwana, 2012; Ozkan and Koseler, 2009; Thomas and Cunningham, 2003). Nwana (2012) suggests that not only are these electronic mediums used for learner content delivery but should also provide a platform for interactions amongst participants. The key participants in the online environment are learners, faculty, employers, administrators and information technology (IT) employees (Ozkan and Koseler, 2009). A far more precise definition, is the utilization of computer networks for the purposes of achieving tasks and deliverables (Lau et al., 2014). E-learning has also been described as a learning platform accessed by learners and instructors, specifically via the internet (Rosenberg, 2001). This is consistent with the definition by Arbaugh (2002) who describes e-learning as the utilization of the internet as a mechanism to facilitate or distribute learning content. Other definitions of e-learning regard it as any form of self-guided learning using web technologies which makes information or knowledge available to learners irrespective of time and geographical placement (Lau et al., 2014; Sun et al., 2008). Sun et al. (2008) defined the term as the application of ICT to disseminate or facilitate material for educational purposes which is close to the definition by Selim (2007) who describes e-learning as the utilization of ICTs in order to deliver educational content. According to Sangrà et al. (2012), e-learning is often regarded as the natural progression of distance learning.

E-learning is be segmented into two key classifications or types, namely synchronous or asynchronous learning (Garrison, 2011). Synchronous learning refers to learning which imitates a traditional face-to-face classroom whereby the interactions between participants occurs in a simultaneous manner, real-time or live. In synchronous learning, the learning is facilitated or delivered without a time delay through the use of ICTs such as virtual classrooms, conferencing and chat (Abdellatief, 2011; Cantoni, 2004; Garrison, 2011). Conversely, asynchronous learning refers to learning whereby the interactions between participants do not occur at a simultaneous manner and the onus is usually on the learners to access the learning content at any time, according to their own pace and convenience. In asynchronous learning, the learning can be delivered by means of electronic forms such as CD-ROM, videos or audio recordings, emails and discussion groups (Abdellatief, 2011; Cantoni, 2004; Garrison, 2011). In addition to the two classifications of e-learning, there are different e-learning approaches which can be applied such as blended learning (online learning combined with traditional classroom learning) and mobile learning (Pani et al., 2015).

2.3 THE USE OF E-LEARNING IN HEIs IN DEVELOPING COUNTRIES

Literature on the use of e-learning in HEIs in developing countries was extracted from the findings from the papers that were reviewed from the SLR which was conducted to identify the factors that influence the use of e-learning by students in HEIs within the context of developing countries. These results are characterised by e-learning type; information delivered through e-learning; devices used to access e-learning; the driver of e-learning usage; and the e-learning environment.

2.3.1 Types of E-learning Implementations

A study by Abbad (2021), which applied the UTAUT model to understand students' usage of e-learning systems in developing countries, noted that Moodle was the system that was used. It was further revealed that Moodle was designated as one of the most regarded and broadly used systems owing to its wide-ranging functionality as well as the fact that it is an open source. In the study, Moodle was outlined to deliver learning, learning material, assessments, and forums and further facilitated interactions between students and lecturers. Another study whereby Moodle was used is that by Buabeng-Andoh and Baah (2019) which explored the factors that significantly influence student usage at an HEI in Ghana. Additionally, Moodle was one of three e-learning systems used in the study which spanned 24 HEIs across Brazil (Cidral et al., 2018). Interestingly, in a study by Ain et al. (2016) an LMS powered by Moodle referred to as Spectrum (Student Powered e-Collaboration Transforming UM) was used as the system used by students in Malaysian HEIs.

According to a few studies, Blackboard was another e-learning system that was identified to be used by students in HEIs (Alshehri et al., 2019; Binyamin et al., 2017). In addition, Blackboard was one of three e-learning systems in two different studies which categorised three e-learning systems; one in the study by Cidral et al. (2018) in HEIs across Brazil and another by Alshammari (2020) investigated e-learning in three HEIs in Saudi Arabia. Additionally, Blackboard was also used in a study by Al-Mamary (2022), a study seeking to understand the use of learning management systems by undergraduate university students using the UTAUT model during the COVID-19 pandemic. Interestingly, a study by Almaiah and Alyoussef (2019) investigating the main determinants that could influence the actual use of e-learning in Saudi Arabia, indicated that while the majority of Saudi universities use Blackboard there was no reference to that specific system in that particular study (Alshahrani et al., 2018, as cited in Almaiah & Alyoussef, 2019).

Desire2Learn was another system identified in the study by Alshammari (2020), examining the influence of technical support, instructional design and self-efficacy on students' use of e-learning.

Additionally, studies by Yakubu and Dasuki (2018, 2019), investigated the factors that influence the adoption and use of Canvas, a web-based system, in higher education in Nigeria. Several other studies did not make specific reference to the exact e-learning system used and refer to it as LMS or online learning system or e-learning or university proprietary system (Aldholay et al., 2018; Ali et al., 2018; Amin and Zaman, 2021; Cidral et al., 2018; Gurban and Almogren, 2022; Manjeese, 2022; Mohammadi, 2015; Raza et al., 2020; Twinamasiko et al., 2021).

2.3.2 Information Delivered

Spectrum powered by Moodle was used as a platform to allow students to access course material and other resources in the study by Ain et al. (2016). Additionally, in a study by Yakubu and Dasuki (2018) where Canvas, a web-based system, was used for course organisation; discussion forums facilitation; plagiarism checking; and the formulation and scoring of assignments and quizzes. In a later study by the same authors, Yakubu and Dasuki (2019) highlighted that Canvas provisioned students with access to class material, shared learning and facilitation of online tests and exams. Finally, Abbad (2021) specified that the course material described as available on Moodle in that specific HEI, were PowerPoint presentations, homework, videos, reading references, discussion forums and syllabuses.

2.3.3 Devices

Only one study explicitly outlines the devices that were used to access e-learning and the findings revealed that 39.8% of respondents made use of a laptop; 34.5% used a PC, and 25.8% made use of a phone, specifically iPhone (Alshammari, 2020).

2.3.4 Driver of Usage

Spectrum powered by Moodle was mandatory for all students in the study by Ain et al. (2016). Consistently, in a study by Yakubu and Dasuki (2018) and a later study by the same authors, Yakubu and Dasuki (2019), the Canvas system was used in a mandatory setting. Furthermore, e-learning was also mandatory in a study investigating the effects of UTAUT and usability qualities on students' use of learning management systems (Alshehri et al., 2020). This is consistent with a previous study by Alshehri et al. (2019), where the use thereof was mandatory too.

Additionally, a few studies occurred in the context of the COVID-19 pandemic (Al-Mamary, 2022; Manjeese, 2022; Twinamasiko et al., 2021). In addition, Raza et al. (2020) investigated the influence of social isolation and the moderating role of Corona Fear on behavioural intention in Pakistan. Interestingly, Abbad (2021) investigated e-learning usage in the context of the COVID-

19 pandemic, however, it was further noted that the use of the e-learning system, Moodle was not mandatory. Finally, in a study looking at factors that might influence whether or not e-learning will be used during the COVID-19 pandemic, it was noted that there were university closures and students were using e-learning as a result thereof (Gurban & Almogren, 2022).

2.3.5 Learning Environment

Only one study explicitly outlined where students accessed their e-learning, namely, the study by Ali et al. (2018) that assessed e-learning systems in higher education institutions in Pakistan revealed that 51% of respondents accessed e-learning from the respective HEI, 39% at home, 5% at work and finally, 4% at an internet café. Findings by Twinamasiko et al. (2021), a study which sought to determine factors influencing e-learning acceptance and use in three Ugandan universities, revealed that there was a decrease in students that used e-learning at home in comparison to at school.

2.4 THE INFLUENCE OF PERSONAL, SOCIAL, ENVIRONMENTAL AND TECHNOLOGICAL FACTORS ON THE USE OF E-LEARNING

The findings from the papers that were reviewed from the SLR, which was conducted to identify the factors that influence the use of e-learning by students in HEIs within the context of developing countries, is presented in this section. The method of classification was applied based on the premise of Sen (1992) which outlines that the degree to which an individual can produce capabilities from resources is affected by conversion factors which is consistent with the perspective that factors can influence the degree to which students can produce capabilities from e-learning. Thus, the classifications as outlined by Sen (1992) are personal, those linked to the personal characteristics of a student; social, characteristics of the social settings; and environmental, characteristics linked to the environment in which the student lives. Additionally, the fourth and final classification is technological factors which consist of those linked to the information technology artefact itself which in this case is the e-learning system.

2.4.1 Personal Factors

The personal factors influencing the use of e-learning identified from the SLR were behavioural intention; self-efficacy; behavioural control; user satisfaction; attitude towards use; performance expectancy; habit; experience; motivation; student capabilities; adaptation; and ICT skills and knowledge, which are depicted below.

2.4.1.1 Behavioural Intention

Behavioural intention was identified as one of the factors that affected the use of e-learning by students in higher education in developing countries (Abbad, 2021; Ain et al., 2016; Ali et al., 2018; Al-Mamary, 2022; Alshammari, 2020; Alshehri et al., 2020, 2019; Amin and Zaman, 2021; Mohammadi, 2015; Raza et al., 2020; Yakubu & Dasuki, 2019,2018). According to Fishbein and Ajzen (1980), behavioural intention is the indication that one is ready to conduct a certain behaviour, which subsequently influences the actual behaviour. Interestingly, Alshehri et al. (2019) suggested that the connection between variables, behavioural intention and actual use, should be logically considered due to e-learning being mandatory for students in Saudi higher education. Finally, the study by Gurban and Almogren (2022), which specifically investigated the use of e-learning in the context of the COVID-19 pandemic, also found that behavioural intention had a significant influence on the actual use of e-learning.

2.4.1.2 Computer Self-efficacy

Computer self-efficacy, which was conceptualised as a students' credence about their ability to perform computer-related tasks, was found to have a direct and positive effect on the actual use of the e-learning system in higher education (Ali et al., 2018; Binyamin et al., 2017).

2.4.1.3 Behavioural Control

Findings by Amin and Zaman (2021) which applied the Unified Theory of Acceptance and Use of Technology (UTAUT) to explore the protagonist factors that may expedite learners' experience and skills needed to embrace e-learning, revealed that behavioural control had a significant impact on user behaviour.

2.4.1.4 User Satisfaction

User satisfaction was another factor identified to have a positive and statistically significant influence on the actual usage of e-learning (Binyamin et al., 2017; Cidral et al., 2018; Mohammadi, 2015; Yakubu and Dasuki, 2018). User satisfaction is referred to an individual's perceptions of being satisfied with a system relative to the initial expectations of using the system (DeLone and McLean, 2003). Additionally, in the context of e-learning during the pandemic, a study by Gurban and Almogren (2022) revealed that student satisfaction had a good relationship with actual use the actual of e-learning.

2.4.1.5 Attitude Towards Use

Findings by Gurban and Almogren (2022) revealed that attitude towards use positively influenced the actual use of e-learning, specifically in the context of learning during the COVID-19 pandemic.

The same outcome was concluded previously by Binyamin et al. (2017), in a study which investigated factors that led to the appropriate utilisation of e-learning.

2.4.1.6 Performance Expectancy

Buabeng-Andoh and Baah (2019) found that performance expectancy was positively correlated with the actual use of LMS and suggested that students will adopt a technology if they were able to identify its usefulness in their education. According to Venkatesh et al. (2003), performance expectancy refers to the extent to which an individual believes that using a system will aid them in performing well.

2.4.1.7 Habit

Findings by Ain et al. (2016) revealed that the relationship between habit and use of e-learning was not statistically significant, which was not the outcome that was initially expected by the authors. One of the probable justifications outlined for this outcome was that although students may have performed tasks regularly using e-learning, it may have not necessarily been habitual. Additionally, it was depicted that e-learning was mandatory in the context of that particular study, hence the probable reason for the outcome was that it may have been used from a perspective of social pressure as opposed to habit (Ain et al., 2016).

2.4.1.8 Experience with e-learning

Experience, which indicates the number of years a student uses e-learning, was found to have a positive influence on the actual use of e-learning in developing countries (Binyamin et al., 2017).

2.4.1.9 Motivation

Motivation, the driver behind doing something, was also identified as a factor influencing e-learning in the study by Manjeese (2022) where it was emphasised that improving the acceptability of a system, results in an increase in motivation by employees and students in the usage of e-learning in higher education.

2.4.1.10 Student Capabilities

A study by Manjeese (2022) outlined the ethics and user qualities construct as a factor influencing e-learning which was further broken down into two key measures: student capabilities and instructor qualities. From the student capabilities perspective, the findings revealed that this measure was important to the success of e-learning, specifically in ensuring that students are able and prepared to use e-learning.

2.4.1.11 Adaptation

Findings also revealed that adaptation to e-learning was necessary for learning to occur and had to come from both educators and students (Manjeese, 2022). For educators, it was highlighted that their content and teaching material had to be adapted to the new environment; whereas students had to adapt to new ways of life for teaching and learning to take place.

2.4.1.12 ICT Skills and Knowledge

Findings by Manjeese (2022) identified ICT skills and knowledge as a factor influencing e-learning; which was depicted as a measure of system acceptability and technical know-how. The system acceptability factor scrutinises the possibility of a system being rejected because of the lack of ICT skills and knowledge. Technical know-how on the other hand scrutinises the degree to which the knowledge of ICT or the system can affect the success of the system. The findings on both measures highlighted how vital it is to have skilled ICT employees and students to increase the chances of e-learning success; which was credited to training being provided to users (Manjeese, 2022).

2.4.2 Social Factors

Three social factors influencing the use of e-learning identified from the SLR were social influence; government support; and availability, which are depicted below.

2.4.2.1 Social Influence

In the study by Alshehri et al. (2020), it was found that students' perception of the influence of university officials, lecturers, and peers in motivating them to use e-learning had a positive influence on their usage. Moreover, the same outcome was revealed by Binyamin et al. (2017), in a study that investigated the factors that lead to the appropriate utilisation of LMS. Conversely, findings by Buabeng-Andoh and Baah (2019) indicated that social influence was not positively correlated with actual use, which was not the outcome that was initially expected by the authors. One of the probable justifications outlined for this outcome was that students were not placing much importance on the opinions of others but rather on their own experience in using the technology.

2.4.2.2 Government Support

Findings by Manjeese (2022) suggested that government support is sometimes required in endorsing the use of new technology and that they can assist by coming up with regulations to support use and procurement through favourable taxes and subsidies in higher education.

2.4.2.3 Availability

According to the study by Manjeese (2022), availability refers to the amount of effort required for an innovation to be obtained for adoption. Subsequently, availability encompasses the accessibility and availability of ICT resources in the form of hardware, software, and connectivity equipment for students and lecturers (Manjeese, 2022). The findings revealed that the internet and laptops or phones were significant for e-learning, and it was also suggested that access could be guaranteed through free or subsidised provisions made by the government.

2.4.3 Environmental Factors

The environmental factors influencing the use of e-learning identified from the SLR were facilitating conditions; transformational leadership; instructor qualities and behaviour; teacher role; management support; and learning environment, which are depicted below.

2.4.3.1 Facilitating Conditions

Several studies found that facilitating conditions had a direct and positive influence on the actual use of e-learning in HEIs in developing countries (Ain et al., 2016; Aldholay et al., 2018; Ali et al., 2018; Al-Mamary, 2022; Alshehri et al., 2019b, 2020; Buabeng-Andoh and Baah, 2019; Yakubu and Dasuki, 2018, 2019). According to Venkatesh et al. (2003), facilitating conditions refer to the magnitude to which an individual believes that the organisational and technical infrastructure can provide the use of technology. The study by Al-Mamary (2022) further indicated specifically that if university students were convinced that there was technological infrastructure for support, it would motivate them to use the e-learning system.

Additionally, the study by Buabeng-Andoh and Baah (2019) rearranged facilitating conditions into organisational support and ICT infrastructure and subsequently investigated them separately as opposed to as a single construct as conceptualised in the application of UTAUT. The findings revealed that although ICT infrastructure did not significantly influence the actual use of e-learning, it was highlighted that the unavailability of internet connectivity, issues with power supply, and inadequate laboratory were some of the critical concerns raised by students. The findings further revealed that organisational support had a positive influence on the use of e-learning and it was indicated that organisational support such as training and support were key determinants in deciding whether or not students would use the e-learning system (Buabeng-Andoh & Baah, 2019). Findings by Yakubu and Dasuki (2019) suggested that students had the necessary knowledge and resources required to support the use of Canvas, the e-learning system observed in their study in Nigeria. Additionally, it was noted that invariant facilities were provided

to all students, which could justify why facilitating factors had a positive influence on the use of the system powered by Moodle referred to as Spectrum (Student Powered e-Collaboration Transforming UM), referenced in that study (Ain et al., 2016).

2.4.3.2 Transformational Leadership

The study by Aldholay et al. (2018) found that transformational leadership had a positively significant influence on usage, which suggested that students were inspired, motivated and encouraged to make use of e-learning. Furthermore, for students, having their efforts recognised, resulted in a higher frequency and duration of their e-learning use. The study further depicted that overall quality had an indirect influence on the actual usage amongst students through transformational leadership. Thus, the more e-learning was interactive, responsive, reliable, easy to use, flexible and had up-to-date information, the more students would use it regularly and for longer durations, especially when they were encouraged, motivated and recognised by the lecturers (Aldholay et al., 2018).

2.4.3.3 Instructor Qualities and Behaviour

Findings by Almaiah and Alyoussef (2019) revealed that instructor behaviour had a positive impact on the actual use of e-learning; this encompassed self-efficacy, attitude towards e-learning, experience and incentives for instructors when using e-learning. Moreover, the findings on instructor qualities revealed that instructors needed to work on ensuring that they replicate the classroom environment on the electronic platform to encourage students to accept and embrace the new medium.

2.4.3.4 Teacher Role

The extent to which students feel that their lecturers believe they should use e-learning was another factor identified to positively influence the actual use of e-learning (Binyamin et al., 2017).

2.4.3.5 Management Support

Management support was also identified as an influencing factor of e-learning in the study by Manjeese (2022), with a specific focus on the support provided to employees and students in making usage feasible and in ensuring that there was adequate availability of resources.

2.4.3.6 Learning Environment

A study by Manjeese (2022), which was done on e-learning in the context of the COVID-19 pandemic in Zimbabwe, revealed that noise was one of the factors identified by students and outlined the number of disturbances to on-going activity. It was further advised that the guarantee

of a convenient learning environment was substantial for e-learning and too many disturbances could be a hindrance (Manjeese, 2022).

2.4.4 Technological Factors

The technological factors influencing the use of e-learning identified from the SLR were service quality; technical support; course assessment; course content support; course design; usability; effort expectancy; relative advantage; compatibility; curriculum needs; information quality; system quality; and collaboration quality, which are depicted below.

2.4.4.1 Service Quality

Service quality which was outlined as a measure of responsiveness, empathy, trust, and security, was initially identified as a probable factor that could influence the usage of e-learning in higher education in developing countries in the study by Cidral et al. (2018). Conversely, the findings revealed that service quality had a negative and statistically insignificant influence on the use of e-learning in that particular study which investigated e-learning success determinants amongst 24 HEIs all over Brazil (Cidral et al., 2018). According to DeLone and McLean (2003), service quality, a construct of the D&M success model, refers to the service support which relates to how responsive and competent the technology is.

2.4.4.2 Technical Support

Findings by Alshehri et al. (2019) revealed that technical support had a significant influence on the use of e-learning which was characterised by the support a university provides to learners in a manner that is effective and efficient. The aspects outlined in that study were the insufficiency of system training; lack of IT support availability; and the substantial amount of time the IT group took in reacting to student requests.

2.4.4.3 Course Assessment

Course assessment was another factor identified to have a positive influence on the actual use of e-learning (Almaiah & Alyoussef, 2019). It was depicted as the administration of assignments, continuous assessment tests and end-of-semester examinations which are all administrated online.

2.4.4.4 Course Content Support

Almaiah and Alyoussef (2019) found that course content support, which was outlined as the utilisation of multimedia features with compact content and suitable instructional methods used to

encourage the engagement and motivation of students, had a positive impact on the actual use of e-learning.

2.4.4.5 Course Design

Another factor identified to influence e-learning was course design, an outline of the course, considering factors such as information, instructional objectives, layout and output (Almaiah & Alyoussef, 2019).

2.4.4.6 Usability

Usability of the e-learning system was also identified as a factor that influences the usage thereof as findings by Manjeese (2022) revealed that students desired the features of the e-learning system to be simple, user-friendly and an imitation of the face-to-face traditional classroom environment.

2.4.4.7 Effort Expectancy

Closely linked to usability, effort expectancy was identified as another factor influencing the use of e-learning; which according to Buabeng-Andoh and Baah (2019), implied that students would use technology if they deemed it easy to use and not when it is deemed to be difficult. Effort expectancy refers to the magnitude of the ease of use of a system (Venkatesh et al., 2003).

2.4.4.8 Relative Advantage

According to Manjeese (2022), relative advantage refers to what users believe the benefits are of adopting one system over others or the one which is currently in use and how the proposed system will improve the current way of doing things. The findings on relative advantage were subsequently classified into spread boundaries and decreased costs. Spreading boundaries were defined as the use of e-learning which enabled learning to occur irrespective of geographical location whereby the student and lecturers could take advantage of the technology and perform their learning functions which were previously not possible (Manjeese, 2022). Finally, decreased costs were also identified with specific reference to remote access at reduced costs; easy access to data; reduced operational costs by the institutions; reductions in stationary, travelling and accommodation costs.

2.4.4.9 Compatibility

According to Manjeese (2022), the construct of compatibility refers to how simply an innovation can be assimilated into an institution or an individual's life; the degree of change required to successfully use the innovation. The findings revealed that limited or existing technologies should

be able to host e-learning; understand the complexity of implementing new e-learning; and existing processes and technology should be able to host new technology (Manjeese, 2022).

2.4.4.10 Curriculum Needs

Findings by Manjeese (2022) revealed that curriculum needs had an influence on ascertaining whether or not lectures could take place online or face-to-face and were classified into: learning requirements of students and practice. For the learning requirements of students, it was found that students needed personalised feedback; interaction such as that in the classroom; lecturers' specialised attention; social interaction with lecturers and peers, indicating some of the responses provided by students. Finally, for practice, the author emphasised the importance of establishing how learning content could be carried out electronically. This outlined the course content and how it was delivered to students as some courses were practical-based, others theory-based and others, a mixture of the two.

2.4.4.11 Information Quality

Information quality, conceptualised as an e-learning system's information quality, compromises factors such as applicability, comprehensiveness, and reliability found to have a positive and statistically significant influence on the use of e-learning (Cidral et al., 2018).

2.4.4.12 System Quality

System quality, depicted as the e-learning system's functionality, useability, navigability and accessibility that users perceive, was found to have a negative and statistically insignificant influence on the use of e-learning (Cidral et al., 2018).

2.4.4.13 Collaboration Quality

Findings by Cidral et al. (2018) identified collaboration quality as another factor influencing the usage of e-learning, which encompassed cooperative electronic features, culture and the use of such platforms on various devices.

2.5 CHALLENGES THAT HINDER THE SUCCESS OF E-LEARNING IN HEIs WITHIN THE CONTEXT OF DEVELOPING COUNTRIES (INFRASTRUCTURAL, INSTITUTIONAL, INDIVIDUAL AND SOCIETAL CHALLENGES)

The findings from the papers that were reviewed from the SLR which was conducted to identify the challenges that hinder the success of e-learning in HEIs within the context of developing

countries have been categorised into the following classifications: infrastructural, institutional, individual, and societal challenges. The synthesis of findings into these four classifications was done in iterative cycles of assessing relations and patterns to establish which factors were more suited to be grouped.

2.5.1 Infrastructural Challenges

The infrastructural challenges hindering e-learning identified were inadequate ICT infrastructure; internet connectivity-related issues; electricity outages; inadequate computer laboratories; and poor learning home environments, which are depicted below.

2.5.1.1 *Inadequate ICT Infrastructure*

The lack of adequate technological infrastructure was identified as one of the major impediments to e-learning (Al-Azawei et al., 2016; Idris & Osman, 2015; Karkar et al., 2020; Tarus et al., 2015; Vershitskaya et al., 2020). Findings by Moakofhi et al. (2017) revealed that a disproportion between the number of network points on campus and the number of students can result in a strain on the accessibility and performance of the infrastructure. This challenge was also reported by Karkar et al. (2020) whereby the deployed server could not handle scalable demands, which was similar to Kaisara and Bwalya (2021) who reported on system inaccessibility, potentially due to the high traffic of users. In addition, Narh et al. (2019) reported on the lack of progressive technologies deployed to support e-learning-related functions which in turn, affected the usage thereof as well as issues related to e-learning system failure.

2.5.1.2 Internet Connectivity and Bandwidth Issues

As a result of inadequate infrastructure, internet connectivity-related issues are another hindrance (Aboagye et al., 2021; Adnan & Anwar, 2020; Chung et al., 2020; Egielewa et al., 2021; Kaisara & Bwalya, 2021; Karkar et al., 2020; Moakofhi et al., 2017; Mushtaque et al., 2021; Narh et al., 2019; Vershitskaya et al., 2020; Yakubu & Dasuki, 2021). Basahel and Basahel (2018) reported frequent occurrences of technical breakdowns and interruptions in the e-learning system because of poor internet connectivity. Similarly, Bishnoi and Suraj (2020) found that such issues caused delays in completing online examinations. Idris and Osman (2015) illustrated that in some cases the connectivity offered by the HEI was so bad that students would opt to use internet facilities off campus as they were deemed to be more efficient.

The issue of internet connectivity can be attributed to poor network and signal coverage in remote areas (Henaku, 2020; Mohammadi et al., 2021; Mutisya & Makokha, 2016; Selvanathan et al.,

2020; Twinamasiko et al., 2021). Rotas and Cahapay (2020) found that students would go as far as climbing on top of the roof of their houses to get a better connection, not just due to their remote geographical location but in some cases due to the weather too.

In cases where fibre and wireless connectivity was available, issues related to bandwidth costs and limited hotspots were reported (Aboagye et al., 2021; Mutisya & Makokha, 2016; Twinamasiko et al., 2021; Yakubu & Dasuki, 2021). This challenge of the high cost was also highlighted by Tarus et al. (2015) who demonstrated that even in cases where the government subsidised the bandwidth for public universities, the cost was still significantly high, and it was difficult to attain enough bandwidth to enhance the internet connection, while Chung et al. (2020) found that although some telecommunication companies in Malaysia provided limited broadband to students for free, it was still not sufficient for students to complete their e-learning functions.

Al-Azawei et al. (2016) reported that the uploading or downloading of the content would take considerable time due to low internet connectivity. Additionally, once students and lecturers are out of the bounds of the HEIs, the onus is on them to pay for internet facilities (Mutisya & Makokha, 2016).

2.5.1.3 Electricity Outages

Electricity outages have been reported as another challenge affecting e-learning (Egielewa et al., 2021; Mohammadi et al., 2021; Mushtaque et al., 2021; Qureshi et al., 2012). Furthermore, the study by Moakofhi et al. (2017) conducted in Botswana, indicated that power outages occurred at least once a week and therefore affected internet availability, while Rotas and Cahapay (2020) reported that the outages occurred in a frequent and unanticipated fashion. The outages reportedly caused a high degree of apprehension among students when completing online examinations (Bishnoi & Suraj, 2020).

2.5.1.4 Inadequate Computer Laboratories

Mutisya and Makokha (2016) ranked inadequate computer laboratories as the seventh (out of eight) challenge to e-learning. The findings revealed that the laboratories were not well equipped for e-learning and did not have enough facilities to accommodate most students, which was attributed to financial challenges, similar to findings by Moakofhi et al. (2017). Due to limited space, students were required to wake up early to secure space or would have to wait for hours until there was availability (Mutisya & Makokha, 2016), while Rotas and Cahapay (2020) reported on internet laboratories off campus also not providing a conducive learning environment due to distractions.

2.5.1.5 Unconducive Home Environment

Poor learning home environments were also identified as a challenge to e-learning, whereby students reportedly struggled to find conducive study areas (Mushtaque et al., 2021; Rotas & Cahapay, 2020). Bishnoi and Suraj (2020) suggested that this challenge was mostly attributed to the difficulties of creating study space under the quarantine circumstances, while Kaisara and Bwalya (2021) suggested that it could be attributed to crowded high-density locations. In addition, findings also revealed that some students were unable to focus due to the distractions and noise from family members in their home environment (Chung et al., 2020; Egielewa et al., 2021; Henaku, 2020).

2.5.2 Institutional Challenges

The institutional challenges hindering e-learning identified were financial constraints; lack of stakeholder collaboration; e-learning course administration issues; copyright issues; operational e-learning policies, standards, and guidelines issues; inadequate technical support; lack of trust and privacy; and contextual challenges, which are depicted below.

2.5.2.1 Financial Constraints

Just as with any other information technology initiative, a significant amount of capital investment is required to implement an e-learning system and lack of funding is a barrier to the success thereof (Al-Azawei et al., 2016; Moakofhi et al., 2017; Tarus et al., 2015; Vershitskaya et al., 2020). Furthermore, Almaiah et al. (2020) reported that challenges with financial support can also lead to project delays.

2.5.2.2 Lack of Institutional Stakeholder Collaboration

There are factors relating to the specific course which can result in challenges that hinder e-learning. Basahel and Basahel (2018) reported on the lack of collaboration between academic staff, designers, and developers of the e-learning platform.

2.5.2.3 E-learning Course Administration Issues

Challenges regarding the difficulty of structuring and administrating e-learning courses have also been identified as major hindrances (Moakofhi et al., 2017; Vershitskaya et al., 2020). Tarus et al. (2015) revealed that the conversion of content to electronic format was considered time-consuming which lecturers stated they did not have. Amongst other lecturer-related issues identified were their insufficient technological skills and knowledge as well as their speaking pattern (Aboagye et al., 2021; Narh et al., 2019; Twinamasiko et al., 2021). Additionally, Mutisya

and Makokha (2016) found that the high volume of students online posed a threat to the coordination of courses by lecturers. With regards to issues related to the content, Rotas and Cahapay (2020) reported on ambiguous content, whereby instructions were sometimes not structured in a clear manner which confused students and was consistent with findings by Aboagye et al. (2021); as well as the overloading of learning activities which in some cases would result in the loss of learning value. Furthermore, Mohammadi et al. (2021) reported on issues regarding the quality of the content, where students felt that there was not a variety of material such as audio and video uploaded by lecturers.

In addition, Chung et al. (2020) found that there were many variations of e-learning methods applied by different lecturers which also posed a challenge to students; while Mohammadi et al. (2021) reported that in some cases lecturers would use social media platforms instead of the respective e-learning system. Furthermore, challenges linked to the e-learning system design and usability were also identified, whereby it was considered not to be useful because it was time-consuming to work around the performance and usability shortcomings (Almaiah et al., 2020; Mohammadi et al., 2021). Kaisara and Bwalya (2021) reported that the system was hard to navigate; while Narh et al. (2019) found that ineffective orientation inhibited students' ability to familiarise themselves with the e-learning system.

Interestingly, findings by Karkar et al. (2020) demonstrated that when there is an option to use a social media site for e-learning, lecturers and students would choose that option over the HEI's official e-learning regardless of the motivation, functional benefits, and training provided. Although social media has several limitations such as confidentiality of grades, difficultly uploading files, and distractions, it is still perceived to be easier to use in comparison to the official e-learning platform (Karkar et al., 2020). The limited number of academic programs and courses available for learning in the online environment also presented a challenge to e-learning for prospective students who may want to pursue their education online (Basahel & Basahel, 2018).

2.5.2.4 Copyright Issues

Al-Azawei et al. (2016) found that in the case where the country has no law that protects against copyright, there are concerns of possible plagiarism on uploaded content as there is no law to challenge this.

2.5.2.5 *Operational e-learning Policies, Standards, and Guidelines Issues*

The absence or lack of distribution of policies and guidelines governing e-learning can also be a challenge to the coordination thereof (Al-Azawei et al., 2016; Vershitskaya et al., 2020). Tarus et

al. (2015) found that there were HEIs that did not have e-learning policies and in cases where they were available, they were not in active use. Findings by Almaiah et al. (2020) indicated that this was an issue linked to change management, which was a crucial part of transitioning to e-learning.

2.5.2.6 Inadequate Technical Support

The lack of technical staff employed to set up and maintain the e-learning system has been identified as a challenge (Al-Azawei et al., 2016). Subsequently, this challenge was further identified as a hindrance to the effective use of the e-learning system (Karkar et al., 2020; Moakofhi et al., 2017; Tarus et al., 2015).

2.5.2.7 Privacy and Security Issues

Moakofhi et al. (2017) identified the lack of trust and privacy as a hindrance whereby findings revealed that there were concerns about the levels of dishonesty that could occur whereby unauthorised students could access and participate on behalf of the registered students. Another security challenge was highlighted by Idris and Osman (2015) regarding concerns about the effectiveness of the antivirus software deployed by the HEI.

2.5.2.8 Contextual Configuration Challenges

Moakofhi et al. (2017) identified several contextual challenges which could hinder e-learning, ranging from formulation of an e-learning framework; the necessary commitment from all stakeholders involved; and the difficulty of teaching specialised courses such as chemistry, anatomy, and parasitology in such a learning environment. Mushtaque et al. (2021) found that e-learning was not suitable for all types of courses.

2.5.3 Individual Challenges

The individual challenges hindering e-learning identified were resistance to change; lack of awareness; workload management issues; limited ICT skills and training; lack of social presence and support; and health issues, which are depicted below.

2.5.3.1 Resistance to Change

Basahel and Basahel (2018) reported on the resistance to change in using an e-learning system. Students' lack of motivation, attentiveness to classes and utter laziness were also found to be a hindrance to e-learning (Egielewa et al., 2021). Findings revealed that the traditional method of learning, the face-to-face classroom, was still the method of preference over the e-learning method (Egielewa et al., 2021; Mohammadi et al., 2021; Narh et al., 2019; Selvanathan et al.,

2020). Findings by Aboagye et al. (2021) revealed that students felt that in the context of the pandemic, the focus should not be placed on learning but rather on household necessities and that e-learning should be halted or postponed, while Henaku (2020) reported that students felt e-learning was only feasible due to the pandemic and should be called-off in the future. This was demonstrated by Moakofhi et al. (2017) where the findings revealed it was a preference of most students; a similar pattern was also identified in the findings by Qureshi et al. (2012). Karkar et al. (2020) suggested that the lack of policies could be a contributing factor to the negative attitude towards e-learning; while Almaiah et al. (2020) suggested that it was attributed to change management-related issues.

2.5.3.2 Lack of Awareness

The challenge of system usage can be attributed to the lack of awareness of e-learning benefits and whether the solution will assist in daily educational tasks (Al-Azawei et al., 2016; Almaiah et al., 2020; Karkar et al., 2020; Vershitskaya et al., 2020). In addition to system awareness, Moakofhi et al. (2017) reported that the lack of awareness regarding privacy and data protection standards can also present a challenge. Additionally, Moakofhi et al. (2017) found that students and lecturers were not aware of the HEI's policies and guidelines regarding e-learning use, due to either the absence thereof or the lack of distribution across stakeholders. Finally, Basahel and Basahel (2018) found that the lack of awareness of e-learning qualification credibility within the labour market disadvantaged students who enrolled online versus those who enrolled using the traditional channel.

2.5.3.3 Workload Management Issues

Rotas and Cahapay (2020) found that the conflict between school and home responsibilities was also a challenge in e-learning, where some students struggle to give their undivided attention to learning due to the duties they need to fulfil at home. Narh et al. (2019) indicated the overall lack of time management as another issue; while Mushtaque et al. (2021) found that students experienced difficulty with covering the e-learning course curriculum given the duration of the e-learning course.

2.5.3.4 Limited ICT skills and training

According to Tarus et al. (2015), one of the key drivers to the success of e-learning is the appropriate level of ICT skills; the lack thereof, on the other hand, was found to be a hindrance (Chung et al., 2020; Mohammadi et al., 2021; Twinamasiko et al., 2021). Additionally, Narh et al. (2019) identified poor computer literacy and self-efficacy as factors that hamper the use of e-

learning as well as students' limited knowledge of internet handles. Interestingly, Idris and Osman (2015) revealed that in some cases where there were adequate computer skills, those skills were not effective in the use of the e-learning system; mostly attributed to the lack of training provided by the HEI. The challenge of inadequate training was also highlighted by Basahel and Basahel (2018) as a hindrance to e-learning. Mohammadi et al. (2021) also identified the issue of students' lack of experience with using e-learning, as they had not used it before the pandemic, while Yakubu and Dasuki (2021) found that in some cases the students would struggle to use the e-learning system in the beginning but after using it for a while, they would eventually get used to it.

2.5.3.5 Lack of Social Presence and Support

The low levels of social interactions between students and lecturers due to the psychological and physical distance were also identified as a challenge (Aboagye et al., 2021; Chung et al., 2020; Kaisara & Bwalya, 2021; Mushtaque et al., 2021; Vershitskaya et al., 2020). This challenge was further highlighted in the context where peer-to-peer collaboration or group activities had to take place among students (Aboagye et al., 2021; Narh et al., 2019; Rotas & Cahapay, 2020; Selvanathan et al., 2020). Adnan and Anwar (2020) also found that the lack of campus socialisation was also a challenge to students. Due to the issue of minimum interaction between students and lecturers, a large portion of students who were registered for online education would just download material and read it independently as opposed to attending the lecture (Mutisya & Makokha, 2016). Basahel and Basahel (2018) suggested that e-learning systems should be modified to increase the level of interactivity among students.

Additionally, findings revealed that students were not happy with the unresponsiveness and/or lack of support provided by lecturers (Rotas & Cahapay, 2020; Selvanathan et al., 2020).

2.5.3.6 Health Issues

Compromised physical health, ranging from eye-strain to headaches as well as sleep deprivation, were identified as some of the health challenges experienced by students in e-learning (Rotas & Cahapay, 2020). Additionally, Mushtaque et al. (2021) found that unhealthy eating and lack of physical activities were some factors that contributed towards weight and obesity issues among students due to the lockdown conditions which was imposed by the pandemic. In addition to physical health issues, findings by Rotas and Cahapay (2020) also highlighted mental health issues which were attributed to the high demands of e-learning, which in some cases drove students to a point where they considered conceding their studies. Other mental issues reported

were anxiety, violence, and behavioural problems which could be attributed to staying at home and the excessive use of technology (Mushtaque et al., 2021). Bishnoi and Suraj (2020) found that poor mental health was heightened as a result of anxiety and stress especially linked to online examinations.

2.5.4 Societal Challenges

The societal challenges hindering e-learning identified were lack of access to e-learning resources; cultural challenges; language barrier; and political issues, which are depicted below.

2.5.4.1 Lack of Access to e-learning Resources

The lack of access to computers or laptops by both academic staff and students has been identified as a challenge to the success of e-learning (Idris & Osman, 2015; Mohammadi et al., 2021; Tarus et al., 2015; Twinamasiko et al., 2021). Challenges resulting in the slow performance of personal laptops or other devices as well as device, website and app compatibility issues were also reported (Aboagye et al., 2021; Chung et al., 2020; Henaku, 2020). Rotas and Cahapay (2020) found that in addition to the lack of access to devices such as laptops, those that used their phones, would encounter issues related to storage capacity in some cases. Furthermore, the financial challenge related to the lack of funds to purchase data was also identified as a hindrance (Aboagye et al., 2021; Egielewa et al., 2021; Kaisara & Bwalya, 2021; Mohammadi et al., 2021); while Yakubu and Dasuki (2021) highlighted very high costs related to quality internet. Rotas and Cahapay (2020) identified the pandemic as a key contributing factor to financial difficulties as some students were not able to find a job to support their learning needs as a result thereof. Furthermore, findings by Henaku (2020) revealed that students would even miss lectures because they could not afford data bundles and in some cases, even parents would complain about purchasing bundles due to financial difficulties.

2.5.4.2 *Cultural Challenges*

Although e-learning does not occur in a physical setting, religious and cultural norms may become a challenge in e-learning if not observed correctly. This was illustrated by Basahel and Basahel (2018) whereby the e-learning system had to follow the same organizational structure as in traditional face-to-face settings, where male and female students had to be separated as per the cultural standards observed in that country, Saudi Arabia.

2.5.4.3 Language Barrier

Al-Azawei et al. (2016) indicated that language could impede e-learning by highlighting that lecturers would be required to put in a lot of effort in preparing for a course when there is a lack of content available in the respective local language (i.e., Arabic).

2.5.4.4 Political Issues

Al-Azawei et al. (2016) illustrated that unstable societal issues such as corruption and wars can also challenge the effectiveness of e-learning.

2.6 SUMMARY GAPS IN THE LITERATURE

This section outlines the theoretical, methodological, practical and contextual gaps in the literature based on the findings of the SLRs.

2.6.1 Theoretical Knowledge Gap

The results reveal that 10 out of the 20 studies extracted from the SLR applied UTAUT as the theoretical model for those studies. Additionally, the second most applied theoretical model applied was the Technology Acceptance Model (TAM), with four studies. Subsequently, two out of the 20 studies used DeLone and McLean's Information Systems Success (D&M ISS). Moreover, two studies integrated two theories: Mohammadi (2015) integrated TAM and D&M ISS, and Cidral et al. (2018) integrated e-learning satisfaction with D&M ISS. Finally, only one study applied Technology-Organization-Environment (TOE), which according to Tornatzky and Fleischer (1990, cited in Oliveira & Martins, 2011) is a theory that is applied at an organisational level and not an individual level such as that of students. These theories outlined above, help in understanding how to get users to accept and use systems; however for a study which has objectives that extend beyond the functional concept of use alone but rather effective use, such theories are not compatible.

***Table 1**: Theoretical Models used in SLR Studies*

Theory	Study	Expansion with other variables
Unified Theory of Acceptance and Use of Technology (UTAUT)	Abbad, 2021; Ain et al., 2016; Almaiah & Alyoussef, 2019; Al-Mamary, 2022; Alshehri et al., 2020, 2019; Amin & Zaman, 2021;	Ain et al., 2016; Almaiah & Alyoussef, 2019; Alshehri et al., 2020; Buabeng-Andoh & Baah, 2019; Raza et al., 2020

	Buabeng-Andoh & Baah, 2019; Raza et al., 2020; Yakubu & Dasuki, 2019	
Technology Acceptance Model TAM	Ali et al., 2018; Alshammari, 2020; Binyamin et al., 2017; Gurban & Almogren, 2022	Ali et al., 2018; Binyamin et al., 2017;
DeLone and McLean's Information Systems Success (D&M ISS)	Aldholay et al., 2018; Yakubu & Dasuki, 2018	
TOE	Manjeese, 2022	
Integrated Theories	Cidral et al., 2018; Mohammadi, 2015	

2.6.2 Methodological Knowledge Gap

Seventeen out of 20 studies extracted from the SLR applied the survey method as their research strategy (Abbad, 2021; Ain et al., 2016; Aldholay et al., 2018; Ali et al., 2018; Almaiah & Alyoussef, 2019; Al-Mamary, 2022; Alshammari, 2020; Alshehri et al., 2020, 2019a; Amin & Zaman, 2021; Binyamin et al., 2017; Cidral et al., 2018; Gurban & Almogren, 2022; Mohammadi, 2015; Raza et al., 2020; Yakubu & Dasuki, 2019, 2018). According to Bhattacherjee (2012), the survey method does not provide a comprehensive depth of the phenomenon being studied and tends to derive generalisations or isolate specific factors to be studied. Thus, for a study which aims to explore and describe factors in more detail, the survey method is not ideal. Conversely, a case study is designed to provide an in-depth and multi-faceted investigation of a phenomenon within the context of its natural or real-life settings using one or multiple sources of evidence which would be more appropriate for such as study (Yin, 2003).

2.6.3 Practical Knowledge Gap

The extraction of results from the SLR, see Table 2 below, reveal that the social factors category consisting of social influence, government support and availability yielded fewer results in comparison to personal and environmental factors, receiving coverage from only three of the 20 studies. The technological factors category consisting of service quality, technical support, course assessment, course content support, course design, availability, usability, relative advantage, compatibility, curriculum needs, information quality, system quality and collaboration quality, received coverage from four studies.

Table 2: Selected Studies for factors influencing e-learning SLR

Factor	Study	Country
Personal Factors	Abbad, 2021; Ain et al., 2016; Ali et al., 2018; Al-Mamary, 2022; Alshammari, 2020; Alshehri et al., 2019; Amin & Zaman, 2021; Binyamin et al., 2017; Buabeng-Andoh & Baah, 2019; Cidral et al., 2018; Gurban & Almogren, 2022; Manjeese, 2022; Mohammadi, 2015; Raza et al., 2020; Twinamasiko et al. 2021; Yakubu & Dasuki, 2018	Pakistan; Bangladesh; Jordan; Nigeria; Malaysia; Saudi Arabia; Iran; Brazil; Ghana; Uganda; Zimbabwe
Environmental Factors	Ain et al., 2016; Aldholay et al., 2018, 2018; Ali et al., 2018; Almaiah & Alyoussef, 2019; Al-Mamary, 2022; Alshehri et al., 2020; Binyamin et al., 2017; Buabeng-Andoh & Baah, 2019; Manjeese, 2022; Yakubu & Dasuki, 2018	Pakistan; Nigeria; Malaysia; Saudi Arabia; Ghana; Yemen; Zimbabwe
Social Factors	Alshehri et al., 2020; Buabeng-Andoh & Baah, 2019; Manjeese, 2022	Saudi Arabia; Ghana; Zimbabwe
Technological Factors	Almaiah & Alyoussef, 2019; Alshehri et al., 2019; Cidral et al., 2018; Manjeese, 2022	Saudi Arabia; Brazil; Zimbabwe

Furthermore, the extraction of results from the second SLR on e-learning challenges revealed that the societal challenges category consisting of ethics, politics, access, culture, and language, yielded fewer results in comparison to the three other key categories of challenges, see Table 3 below. These findings reveal that 19 out of 30 studies reviewed, reported on societal challenges in comparison to 28 out of 30 for infrastructural challenges; 23 out of 30 for institutional challenges; and finally, 25 out of 30 for individual challenges.

Table 3: Selected Studies for e-learning challenges in HEIs SLR

Challenge	Study	Country
Infrastructural Challenges	Aboagye et al., 2021; Adnan & Anwar, 2020; Al-Azawei et al., 2016; Basahel & Basahel, 2018; Bishnoi & Suraj, 2020; Chung et al., 2020; Egielewa et al., 2021; Henaku, 2020; Idris & Osman, 2015; Kaisara & Bwalya, 2021;	Ghana; Nigeria; Pakistan; Iraq; Sri Lanka; Saudi Arabia; India; Zimbabwe; Malaysia; Sudan; Namibia; Tanzania; Mozambique; Namibia; Nepal; Bangladesh;

	Karkar et al., 2020; Moakofhi et al., 2017; Mohammadi et al., 2021; Mushtaque et al., 2021; Mutisya & Makokha, 2016; Narh et al., 2019; Rotas & Cahapay, 2020; Selvanathan et al., 2020; Tarus et al., 2015; Twinamasiko et al., 2021; Vershitskaya et al., 2020; Yakubu & Dasuki, 2021	Botswana; Afghanistan; Pakistan; Kenya; Ghana; Pakistan; Philippines; Malaysia; Uganda and Russia
Institutional Challenges	Aboagye et al., 2021; Al-Azawei et al., 2016; Almaiah et al., 2020; Basahel & Basahel, 2018; Chung et al., 2020; Idris & Osman, 2015; Kaisara & Bwalya, 2021; Karkar et al., 2020; Moakofhi et al., 2017; Mohammadi et al., 2021; Mushtaque et al., 2021; Mutisya & Makokha, 2016; Narh et al., 2019; Rotas & Cahapay, 2020; Tarus et al., 2015; Twinamasiko et al., 2021; Vershitskaya et al., 2020	Ghana; Nigeria; Iraq; Jordan; Saudi Arabia; Sri Lanka; Thailand; Zimbabwe; Malaysia; Sudan; Namibia; Tanzania, Mozambique; Nepal; Botswana; Afghanistan; Pakistan; Kenya; Ghana; Pakistan; Philippines; Uganda and Russia
Individual Challenges	Aboagye et al., 2021; Adnan & Anwar, 2020; Al-Azawei et al., 2016; Almaiah et al., 2020; Basahel & Basahel, 2018; Bishnoi & Suraj, 2020; Chung et al., 2020; Egielewa et al., 2021; Henaku, 2020; Idris & Osman, 2015; Kaisara & Bwalya, 2021; Karkar et al., 2020; Moakofhi et al., 2017; Mohammadi et al., 2021; Mushtaque et al., 2021, 2021; Mutisya & Makokha, 2016; Narh et al., 2019; Rotas & Cahapay, 2020; Selvanathan et al., 2020; Tarus et al., 2015; Twinamasiko et al., 2021; Yakubu & Dasuki, 2021	Ghana Nigeria; Pakistan; Iraq; Jordan; Saudi Arabia; Sri Lanka; India; Malaysia; Nigeria; Ghana; Sudan; Namibia; Iraq; Bangladesh; Botswana; Afghanistan; Pakistan; Kenya; Ghana; Pakistan; Philippines; Malaysia and Uganda
Societal Challenges	Aboagye et al., 2021; Al-Azawei et al., 2016; Basahel & Basahel, 2018; Chung et al., 2020; Egielewa et al., 2021; Henaku, 2020; Idris & Osman, 2015; Kaisara & Bwalya, 2021; Mohammadi et al., 2021; Qureshi et al., 2012; Rotas & Cahapay, 2020; Tarus et al., 2015; Twinamasiko et al., 2021; Yakubu & Dasuki, 2021	Ghana; Iraq; Sri Lanka; Saudi Arabia; Thailand; Zimbabwe; Malaysia; Nigeria; Sudan; Namibia; Tanzania, Mozambique; Nepal; Bangladesh; Afghanistan; Philippines and Uganda

Furthermore, the factors and challenges recorded focus on usage in a functional sense and not necessarily on whether or not that function aids students in their learning process in a manner that empowers them to achieve their desired educational goals, specifically effective usage (Burton-Jones & Grange, 2013). Finally, these factors and challenges are recorded in a voluntarily setting, whereby students are not mandated to use e-learning so the degree to which these factors and challenges influence the students is weighed on based on that and not if e-learning was the only option available for learning.

2.6.4 Contextual Knowledge Gap

As depicted in Table 2, the studies extracted from the SLR on factors influencing e-learning covered the scope of 12 varying developing countries; of which only one represents the Southern African Development Community (SADC) region, Zimbabwe. Additionally, none of the studies investigated e-learning usage in the context of South Africa specifically.

Furthermore, as depicted in Table 3, the studies extracted from the SLR on e-learning challenges in HEIs covered the scope of 23 varying developing countries; of which only 5 out of the 23 represent the Southern African Development Community (SADC) region: Botswana, Mozambique, Namibia, Tanzania and Zimbabwe. Additionally, none of the studies investigated the e-learning challenges in the context of South Africa specifically.

In addition, a preponderance of the studies indicated that in the context in which e-learning was taking place, there was sufficient time for the HEIs to prepare for the electronic learning environment. Few studies indicated that e-learning was taking place under emergency or unavoidable circumstances such as natural disasters, wars or global pandemics, where the traditional face-to-face learning model was not available as an option and where there was limited time to prepare for the transition to e-learning.

CHAPTER 3

3 THEORETICAL BACKGROUND AND CONCEPTUAL RESEARCH FRAMEWORK

3.1 INTRODUCTION

This section presents the theories used in system acceptance and usage; followed by those applied in e-learning use by students in HEIs in developing countries. Thereafter, the theoretical underpinnings for this study are depicted and finally, the conceptual framework for the study is presented.

3.2 THEORIES IN SYSTEM ACCEPTANCE AND USAGE

Several studies in the field of information systems have studied how and why individuals accept and use information technologies (Venkatesh et al., 2003). The Theory of Reasoned Action (TRA) has been classified as one of the first theories used in information technology acceptance, constructed to understand and predict the behaviour of humans (Fishbein & Ajzen, 1980). Fishbein and Ajzen (1980) theorise two key constructions which constitute one's intention to perform: 1) personal attitude towards behaviour intention which refers to one's belief that behaviour will lead to certain outcomes as well as their evaluations of those outcomes; and 2) subjective norm which refers to one's belief of what certain individuals or groups think they should or should not perform the behaviour as well as one's motivation to comply with the respective referents (Fishbein & Ajzen, 1980). Both constructs of TRA were found to have an influence on behavioural intention which is the indication that one is ready to conduct a certain behaviour, which subsequently influences the actual behaviour (Fishbein & Ajzen, 1980).

An adaption of the TRA is the Technology acceptance model (TAM), a theory used to understand computer usage behaviour and how users accept and use a system at an individual level (Davis et al., 1989). Davis (1989) theorises that perceived usefulness and perceived ease of use are fundamental determinants of one's behavioural intention of system usage. The degree to which one believes that using a system will help them perform their function better is referred to as perceived usefulness; and the extent to which one believes that using that system will require no effort is referred to as perceived ease of use (Davis, 1989; Davis et al., 1989). The TAM also hypothesizes that the influence of external variables on intention to use is mediated by perceived usefulness and perceived ease of use. A later extension of the TAM, TAM2, integrated two processes which were identified as crucial for studying IT adoption and use: 1) social influence

processes which consist of subjective norm, voluntariness and image; and 2) cognitive instrumental process which consists of job relevance, output quality, results demonstrability and perceived usefulness (Venkatesh & Davis, 2000). Unlike the TAM2, the TAM did not include the subjective norm as it was not proven to be significant. According to Davis (1989), it was not necessarily important in voluntary settings but would affect intention in mandatory settings. Furthermore, the subjective norm was also found to be significant as an intention of behaviour for inexperienced users (Venkatesh & Davis, 2000). Only five out of the 20 studies extracted from the SLR on e-learning in HEIs in the context of developing countries applied the TAM: Binyamin et al. (2017) investigated factors which led to the appropriate utilisation of e-learning in Saudi Arabia; Ali et al. (2018) assessed e-learning systems in higher education institutions in Pakistan; Alshammari (2020) investigated the influence of technical support, perceived self-efficacy, and instructional design on students' use of LMS; and Gurban and Almogren (2022) investigated factors that may influence whether or not e-learning will be used during the COVID-19 pandemic. An additional study by Mohammadi (2015) investigated users' perspectives on e-learning based on students from four public universities in Iran and applied integration of both the TAM and D&M. Interestingly, all five of these studies employed the TAM in quantitative studies.

In addition, to provide a unified theory which utilises the key characteristics of several other acceptance and use theories and models, Venkatesh et al. (2003) developed the UTAUT. The UTUAT is based on the foundation of the TAM, the Motivational Model, the Theory of Planned Behaviour, the TRA, the Model of PC utilization, the Innovation of Diffusion Theory, and the Social Cognitive Theory. According to Venkatesh et al. (2003), the UTUAT provides a distinguished view of how the determinants of intention and behaviour have progressed over time. 10 out of the 20 studies extracted from the SLR applied the UTAUT: Abbad (2021) applied the UTAUT to understand student's usage of e-learning systems in developing countries; Ain et al. (2016) investigated the influence of learning value on LMS use applying an extension of the UTAUT; Almaiah and Alyoussef (2019) investigated the main determinants that could play an important role in increasing the usage and acceptance of e-learning systems among Saudi students; Al-Mamary (2022) sought to understand the use of LMS by undergraduate university students using the UTAUT model during the COVID-19 pandemic; Alshehri et al. (2019) applied the UTAUT to study how people accept and use the blackboard system; a later study by the same authors (Alshehri et al., 2020) investigated the effects of the UTAUT and usability qualities on students' use of LMS; Amin and Zaman (2021) assessed the adoption behaviour of e-learning in a developing country in South East Asia, specifically Bangladesh; Buabeng-Andoh and Baah (2019) explored the factors that significantly influence student's usage at an HEI in Ghana; a study by

Raza et al. (2020) investigated the influence of social isolation and the moderating role of Corona Fear on behavioural intention; and finally a study by Yakubu and Dasuki (2019) investigated the factors that influence the adoption and use of Canvas in higher education in Nigeria. 9 of these studies employed the UTAUT in quantitative studies.

These theories postulate intention to use as a determinant of usage behaviour, suggesting that the user has the option to accept or reject whether they would like to use the respective system, in somewhat of a voluntary setting. This notion is not consistent with the context in which this study took place, where e-learning has been put in place as an academic continuity measure where there is no other option to learning as the traditional face-to-face model is unavailable, making e-learning use somewhat mandatory to complete educational goals. Although the introduction of the subject norm in the TAM2 and UTUAT caters for mandatory settings as well as the intention to use for inexperienced users, unlike predecessor theories, the focus is still on the intension to use and usage behaviour. According to Venkatesh et al. (2003), many studies have focused on the premise that to realise the benefits of systems, there needs to be an acceptance and usage thereof. This is a consistent notion shared across the TRA, TAM, TAM and UTUAT as outlined above, which helps in understanding how to get users to accept and use systems. However, this premise is inconsistent with the objectives of this study which extend way beyond use alone, but rather seek to investigate where the use is classified as effective. The objectives of this study share the notion provided by Seddon (1997) who states that the use of a system on its own is not sufficient to realise benefits, but when the use thereof is effective the benefits can be realised. Burton-Jones and Grange (2013) define effective use as the type of use of a system that empowers users to achieve their desired outcomes, where systems are not implemented just to be used in a functional sense but rather used to achieve goals. Burton-Jones and Volkoff (2017) exclaim that effective use helps in achieving desired outcomes and does not necessarily guarantee them, thus increasing the probability of achieving the outcome. As reviewed from the studies extracted from the SLR, the studies which used these theories applied the survey method as their research strategy which according to Bhattacherjee (2012) does not provide a comprehensive in-depth view of the phenomenon being studied and tends to derive generalisations or isolate specific factors to be studied. This is inconsistent with the objective of this study which seeks to gain an in-depth, rich and intricate view of factors hindering and enabling effective e-learning. Therefore, these theories are not appropriate to be employed in this study.

3.3 THEORETICAL UNDERPINNINGS

The perspective that conversion factors can influence the degree to which students can produce capabilities from e-learning provides the foundation for this conceptual research framework. Consequently, Sen's Capabilities Approach (CA) is employed as a conceptual lens to understand the various factors which may influence the effective use of e-learning for educational achievement by South African HE students, in the context of academic continuity. The CA was first introduced in the 1980s by Amartya Sen, a distinguished economist and philosopher and has since undergone decades of refinement and review by other scholars (Sen, 1985; 1992; 1999; 2000). Robeyns (2005) contrasts the CA with other utilitarian theoretical approaches which focus on happiness and desire-fulfilment; or economic approaches that are centred around income, expenditure and consumption. The CA is oriented on establishing what individuals are effectively able to do as well as to be. Thus, the CA is based on individuals' capabilities and freedoms; whereby Sen (1999) describes the concept of "freedom" as effective opportunities individuals have to live the type of lives, they have reason to value. As opposed to solely focusing on the availability of resources, Sen (1999) suggests that the focus should be on how the resources can be converted into meaningful opportunities or capabilities for individuals. Consequently, failure to derive meaningful benefits from the resource is a deprivation of the individual's freedom. Moreover, Sen (1992) states that the degree to which individuals can generate capabilities from resources is affected by personal, social and environmental conversion factors. In this regard, the focus is not solely on e-learning itself but rather on which educational opportunities or capabilities students can generate from it and subsequently understanding the various challenges that could affect their ability in doing so.

The CA was developed to be used for a wide range of purposes because it is adaptable and can be practical in different contexts, which has been attributed to its philosophically profound and methodologically flexible nature (Sen, 1993). The application of the CA followed in this paper is similar to that of Zheng and Walsham (2008), where the most basic concepts of the CA are used as a sensitising tool, in comparison to the more complex application in other disciplines. This approach has been deemed an appropriate method of employing the CA in the context of ICTs in developing countries (Zheng & Walsham, 2008). The key concepts used in conceptualising the CA are discussed below:

3.3.1 Functionings and Capabilities

The key elements of the CA are functionings and capabilities. The term functionings refers to the various things an individual can be and do, thus the “beings or doings” of an individual; realised achievements or fulfilled expectations (Sen, 1999). Conversely, according to Sen (1999), the term capabilities, refers to “*the alternative combinations of functionings that are feasible for her to achieve. Capability is thus a kind of freedom: the substantive freedom to achieve alternative functioning combinations (or, less formally put, the freedom to achieve various lifestyles)*" (p75). Essentially, capabilities can be described as the effective possibilities or opportunities for realising achievements or fulfilling expectations. The distinguishing factor between functionings and capabilities is that the former is based on what is achieved or realised, and the latter is based on what is effectively possible or the ability to achieve. According to Sen (1985), it is the capabilities and not the resources that enable individuals to achieve freedom from their desired functionings.

3.3.2 Well-Being and Agency

Sen (1985) indicates that individuals’ capabilities can be observed from two distinct perspectives: well-being as well as agency. Well-being refers to those capabilities which are linked to an individual’s own life or satisfaction. Agency on the other hand refers to the freedom individuals have to pursue, as well as to realise what is of value to them, thus the freedom to pursue their personal goals and interests which their well-being could be a subset of (Sen, 1985). In addition, agency can also include enabling others in achieving their well-being, whereby the individual would then be referred to as an ‘agent’ which Sen (1999) describes as “someone who acts and brings about change” (p19). Robeyns (2005) emphasises that an individual is perceived as an agent in contrast to a patient because the presence of their well-being is the only concern. Consequently, the fundamental basis of the CA is not focused on the possession of material resources (notwithstanding the importance thereof) but on an individual’s real opportunities of achieving well-being as well as agency freedom (Robeyns, 2005). According to Zheng and Walsham (2008), these two freedoms are interconnected because the deprivation of one may result in a casual impact on the other.

3.3.3 Commodities and Conversion Factors

Sen (1985) indicates that it is the capabilities and not the resources that enable individuals to produce freedom of their desired functionings; they are still vital because they provide the foundation for what individuals can do and be. Thus, resources enable the capabilities that an individual can generate which also tend to be referred to as commodities (Robeyns, 2005).

However, according to Sen (1992), the degree to which an individual can produce capabilities from resources is affected by three conversion factors which are categorised under personal, social as well as environmental factors:

- ***Personal conversion factors*** consist of those linked to the personal characteristics of an individual such as mental as well as physical state, literacy and gender which affect the nature and extent of capabilities an individual can generate from resources;
- ***Social conversion factors*** consist of those linked to characteristics of the social settings which range from (not limited to) social norms such as gender roles, religion and heterodoxy. They also include social institutions such as political rights, public policies and rule of law, and power formation such as hierarchal structure and politics, and;
- ***Environmental conversion factors*** consist of those characteristics linked to the environment in which the individual lives such as climate, infrastructure resources and public goods which are critical in converting resources to the functionings of an individual (Robeyns, 2005; Sen, 1992).

Robeyns (2005) cautions that not all capabilities are required to be produced from resources as some may be a result of the actions or behaviour of others such as being respected by others. Additionally, Zheng and Walsham (2008) postulate that the realisation of achievement functioning results from the individual's ability to choose from the capabilities accessible, which is conditioned by personal preferences, social pressure as well as other decision-making mechanisms. These are subsequently also influenced by personal, social and environmental conversion factors. According to Zheng and Walsham (2008), there is a variable relationship between resources and conversion factors which suggests that these conversion factors are not fixed but are rather constantly varying. It is therefore imperative to evaluate and understand these conversion factors because they affect the ability to convert the resources into valuable achievements (Alkire, 2005).

3.4 CONCEPTUAL RESEARCH FRAMEWORK

The conceptual research framework presented in this section provides a basis for examining effective e-learning for academic continuity amongst South African HE students for educational achievement. The perspective that conversion factors can influence the degree to which students can produce capabilities from e-learning provides the foundation for this conceptual research framework. As a result, this framework is formulated on the findings from the SLR (presented in section 2.3) and the employment of the CA as a conceptual lens to understand the various influencing factors. Consequently, the conceptual research framework for this study focuses on

the resource (e-learning); four categories of conversion factors; and students' capabilities, which is effective e-learning for academic continuity where the traditional face-to-face classroom method is unavailable. As described earlier in section 3.3 above, the ability to use e-learning effectively does not necessarily guarantee educational achievement but increases the probability of achieving it. However, the scope of this study does not expand to investigate educational achievement because it is not part of the objectives of this study. Figure 1 below, depicts a simplified adaptation of the core aspects of the capability approach (Robeyns, 2005).

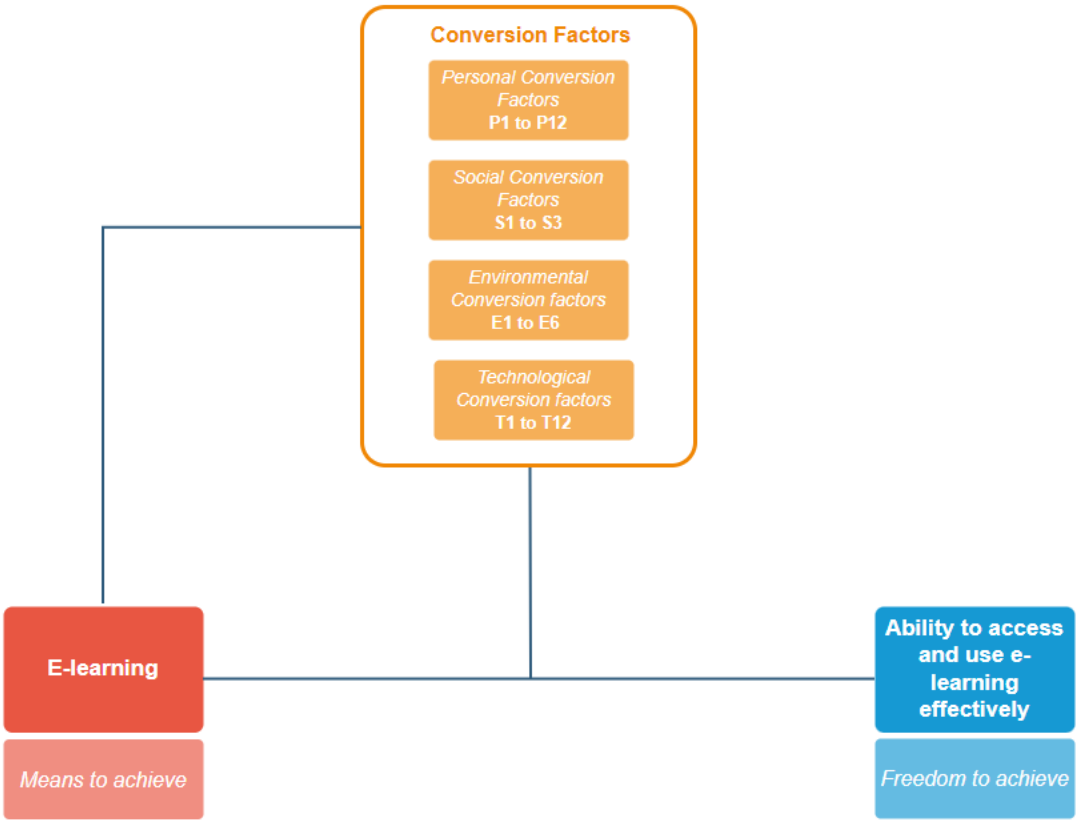


Figure 1: *Conceptual Research Framework*

3.4.1 Key Concepts of Proposed Framework

3.4.1.1 Functionings and Capabilities

The effective use of e-learning provides students with the ability to convert the opportunities and benefits provided by e-learning into valuable educational achievements. In this regard, the actual or realised educational achievements are the functionings, which represent the being or doing of students. In the case of HE students, this could be any educational goal or purpose which drove

the decision for them to enrol in the higher education institution in the first place. It is crucial to highlight that consistent with the definition of effective use provided by Burton-Jones and Grange (2013), this study also conceptualises effective use of e-learning as a manner of helping students achieve their educational goals but does not necessarily guarantee them.

On the other hand, capabilities are the opportunities or benefits that a student receives from e-learning which provides the basis for their freedom to achieve. As a result, this research framework is focused on understanding the factors that may affect students' ability to generate capabilities from e-learning, noting that these capabilities can further lead to the students' ability to achieve functionings. However, the purpose of this paper and the functionings will not be directly observed as it goes beyond what happens after the effective use of e-learning which is not part of the goal of this study.

3.4.1.2 Well-Being and Agency

Well-being can be theorized as the educational achievement that HE students have set for themselves, the goals linked to their enrolling in the HEI and what they wish to achieve., while agency is the freedom the students have, to set and pursue their own goals, of which their educational goals can be a subset. While these concepts are acknowledged, they will not be directly investigated in this study because the study does not seek to understand students' well-being and agency directly. However, consistent with the notion of Burton-Jones and Grange (2013), this study suggests that the effective use of e-learning empowers students in achieving their educational goals (well-being) but does not necessarily guarantee them, which is the focus of this study. Refer to Figure 1 below.

3.4.1.3 Commodity and Conversion factors

The commodity or resource in this framework is the e-learning system itself implemented by HEI and used by the students and other stakeholders which are not part of the scope of this study. The extent to which students can generate capabilities from e-learning is affected by conversion factors which have been categorised under personal, social as well as environmental factors. Although the CA does not provide an exact list of sub-factors in each category, this framework develops a synthesises of the challenges identified in the SLR section with the concepts of conversion factors. Additionally, as part of the contribution to the Information Systems' theory, this framework extends on the three CA conversion factors to introduce a fourth new category which will be referred to as "technological conversion factors", bringing a unique and original contribution

to the Sen's CA by introducing conversion factors which are based on the information technology artefact itself which in this case is the e-learning solution.

3.4.1.3.1 Personal Conversion Factors

Sen (1992) does not provide a specific list of personal conversion factors but refers to them as factors which are linked to the personal characteristics which affect the nature and extent to which capabilities can be produced from resources. This description guides how sub-concepts can be formulated under this category. Subsequently, the findings from the SLR were reviewed in conjunction with their relations and patterns to establish which factors were most appropriate to formulate the personal conversion factors. Consequently, 12 sub-concepts were selected as they are aligned with the characterization of this category and can provide insight into factors associated with the individual, which in this case is the student. As a result, the personal conversion factors for this conceptual research framework are listed in Table 4 below:

Table 4: *Personal Conversion Factors*

#	Sub-concepts	Study
PF1	Behavioural Intention	Abbad, 2021; Ain et al., 2016; Ali et al., 2018; Al-Mamary, 2022; Alshammari, 2020; Alshehri et al., 2020, 2019; Amin and Zaman, 2021; Gurban and Almogren, 2022; Mohammadi, 2015; Raza et al., 2020; Yakubu and Dasuki, 2019, 2018
PF2	Computer Self-efficacy	Ali et al., 2018; Binyamin et al., 2017
PF3	Behavioural Control	Amin and Zaman, 2021
PF4	User Satisfaction	Binyamin et al., 2017; Cidral et al., 2018; Gurban and Almogren, 2022; Mohammadi, 2015; Yakubu and Dasuki, 2018
PF5	Attitude Towards Use	Binyamin et al., 2017; Gurban and Almogren, 2022
PF6	Performance Expectancy	Buabeng-Andoh and Baah, 2019
PF7	Habit	Ain et al., 2016
PF8	Experience with e-learning	Binyamin et al., 2017
PF9	Motivation	Manjeese, 2022
PF10	Student Capabilities	Manjeese, 2022
PF11	Adaptation	Manjeese, 2022
PF12	ICT Skills and Knowledge	Manjeese, 2022

3.4.1.3.2 Social Conversion Factors

Just as with the personal factors, no specific list of social conversion factors is provided but Sen (1992) refers to them as external factors from the social setting in which the individual lives. Thus, the description guides how sub-concepts could be identified by reviewing the results from the SLR and identifying relations and patterns to deduce which factors would be appropriate to formulate social conversion factors. As a result, three sub-concepts were selected as they were consistent with the description of this category and provide insight into the factors which arise from the structure of the society in which students live. Therefore, the social conversion factors for this conceptual research framework are listed in Table 5 below:

***Table 5**: Social Conversion Factors*

#	Sub-concept	Study
SF1	Social Influence	Alshehri et al., 2019; Binyamin et al., 2017; Buabeng-Andoh and Baah, 2019
SF2	Government Support	Manjeese, 2022
SF3	Resource Availability	Manjeese, 2022

3.4.1.3.3 Environmental Conversion Factors

The third category of conversion factors is environmental conversion factors. Just as with the first two categories, Sen (1992) does not provide a specific list of factors, however, he refers to them as those from the environment the individual lives or operates in such as resources, infrastructure, public goods and climate. The sub-concepts were identified by reviewing the results from the SLR and identifying relations and patterns to infer which factors would be most appropriate to formulate environmental conversion factors. Subsequently, six sub-concepts were identified and selected because they were consistent with the description of this category and can provide insight therein. As a result, the environmental conversion factors for this conceptual research framework are listed in Table 6 below:

***Table 6:** Environmental Factors*

#	Sub-concept	Study
EF1	Facilitating Conditions (Organisational and Technological Infrastructure)	Ain et al., 2016; Aldholay et al., 2018; Ali et al., 2018; Al-Mamary, 2022; Alshehri et al., 2019, 2020; Buabeng-Andoh and Baah, 2019; Yakubu and Dasuki, 2018, 2019

EF2	Transformational Leadership	Aldholay et al., 2018
EF3	Instructor Qualities and Behaviour	Almaiah and Alyoussef; 2019
EF4	Teacher Role	Binyamin et al., 2017
EF5	Management Support	Manjeese, 2022
EF6	Learning Environment	Manjeese, 2022

3.4.1.3.4 Technological Conversion Factors

This study introduces a new fourth category referred to as technological conversion factors which consist of factors linked to the information technology artefact itself which in this case is the e-learning system. This category adds a new contribution to the theory and consists of technological sub-concepts which were identified by reviewing the results from the SLR and identifying relations and patterns to infer which factors would be most appropriate to formulate technological conversion factors. Subsequently, five sub-concepts were identified and selected due to their appropriateness in providing insight into this category. This new category is an interesting introduction of Sen's CA into the Information Systems field. The technological conversion factors for this conceptual research framework are listed in Table 7 below:

Table 7: *Technological Conversion Factors*

#	Sub-concept	Study
TF1	Service Quality	Cidral et al., 2018
TF2	Technical Support	Alshehri et al., 2019
TF3	Course Assessment	Almaiah and Alyoussef, 2019
TF4	Course Content Support	Almaiah and Alyoussef, 2019
TF5	Course Design	Almaiah and Alyoussef, 2019
TF6	Usability	Manjeese, 2022
TF7	Relative Advantage	Manjeese, 2022
TF8	Compatibility	Manjeese, 2022
TF9	Curriculum Needs	Manjeese, 2022
TF10	Information Quality	Cidral et al., 2018

TF11	System Quality	Cidral et al., 2018
TF12	Collaboration Quality	Cidral et al., 2018

As described in the preceding sections, the degree to which students can generate capabilities from e-learning is influenced by personal, social, environmental as well as new technological conversion factors (Robeyns, 2005; Sen, 1992).

3.4.2 Questions linked to Conceptual Framework

The section below outlines the questions and how they are linked to the conceptual framework which is relevant to answering the research questions.

3.4.2.1 Participant Background Questions

The participant background questions are driven by the scope of this study, in ensuring that students meet the criteria to participate in this study which are:

- 18 years old and above;
- Enrolled in any South African higher education institution;
- Pursuing either undergraduate or postgraduate studies;
- Used e-learning as the primary mode for education during the non-contract classroom learning, as a manner of ensuring academic continuity due to the pandemic; and
- The modes of e-learning used in this study are those platforms or systems which are accessed by students and instructors, exclusively via the internet.

These background questions are as follows:

Number	**Question**
1.	How old are you?
2	Which higher education institution are you enrolled at?
3.	Which programme are you studying?
4.	What was your primary method of learning before the pandemic?

3.4.2.2 Resource/Commodity (e-learning system) Questions

As depicted by the conceptual framework, resources enable the capabilities that an individual can generate which also tend to be referred to as commodities (Robeyns, 2005). The commodity or resource in this study has been defined as the e-learning system implemented by HEI and used

by the students. Thus, these questions assist in ascertaining the first objective of this study which seeks to describe the use of e-learning by South African HE students:

Number	Question
5.	Which e-learning system do you use at your higher education institution?
6.	How do you access the e-learning system? Which resources do you use?
7.	When do you use e-learning?
8.	What kind of information is delivered through e-learning platforms?
9.	From which location/setting do you access it?**i.e. at home or res or internet café?*

3.4.2.3 Factors Enabling and Hindering the Effective Use of E-Learning Questions

These interview questions assist in ascertaining the second objective of this study which seeks to describe the factors enabling and hindering the effective use of e-learning by South African HE students:

Number	Question
10.	What are the factors you believe enable the effective use of e-learning?
11.	What are the factors you believe hinder the effective use of e-learning?

3.4.2.4 Conversion Factors Questions

The conversion factors interview questions assisted in ascertaining the third objective of this study which sought to describe how personal, social, environmental and technological conversion factors influence the effective use of e-learning:

Table 8: *Conversion Factors and Questions*

Notes from Literature & Conceptual Framework	Number & Question
Personal Conversion factors: **Sen (1992) does not provide a specific list of personal conversion factors but refers to them as factors which are linked to the personal characteristics which affect the nature and extent to which capabilities can be produced from resources.**	12. Can you describe how *personal factors influence your ability to use e-learning effectively? * those linked to the personal characteristics of students such as mental as well as physical state, literacy and gender which affect the nature and extent of capabilities a student can generate from e-learning

Social Conversion factors: **Just as with the personal factors, no specific list of social conversion factors is provided but Sen (1992) refers to them as external factors from the social setting in which the individual lives.**	13. Can you describe how **social factors influence your ability to use e-learning effectively? ** those linked to characteristics of the social settings which range from (not limited to) social norms such as gender roles, religion and heterodoxy. They also include social institutions such as political rights, public policies and rule of law, and power formation such as hierarchal structure and politics
Environmental Conversion factors: **Just as with the first two categories, Sen (1992) does not provide a specific list of factors; however, refers to them as those from the environment the individual lives or operates in such as resources, infrastructure, public goods and climate.**	14. Can you describe how ***environmental factors influence your ability to use e-learning effectively? ***those characteristics linked to the environment in which the student lives such as climate, infrastructure resources and public goods which are critical in converting resources to the functionings of a student
Technological Conversion factors: **This study introduces a new fourth category referred to as technological conversion factors which consist of factors linked to the information technology artefact itself which in this case is the e-learning system.**	15. Can you describe how ****technological factors influence your ability to use e-learning effectively? ****those factors linked to the e-learning system itself which in this case is the e-learning system

CHAPTER 4

4 RESEARCH METHODOLOGY

4.1 INTRODUCTION

This section outlines the research methodology followed in this study which consists of the SLR methodology, research paradigm, approach, strategy, and design which provides an overview of data collection and analysis methods. Thereafter, criteria of how the rigour of the study is evaluated are provided, followed by a detailed description of the ethical considerations observed.

4.2 SLR METHODOLOGY

The systematic review protocols followed in this paper were guided by Okoli and Schabram (2010) who outline the process of producing a research literature review that is systematic, explicit, comprehensive, and reproducible. Please refer to Appendix A for the methodology followed to produce a review of the evidence on the existing body of knowledge about the factors that influence the use of e-learning by students in HEIs in developing countries. Subsequently, the methodology followed to produce a review of the evidence on the existing body of knowledge about the e-learning challenges experienced in higher education in developing countries is also presented.

4.3 RESEARCH PARADIGM AND APPROACH

This study seeks to explore and describe factors influencing effective e-learning for academic continuity amongst South African HE students during the unprecedented context in which the learning is taking place. It seeks to gain an in-depth, rich and intricate view of factors hindering and enabling effective e-learning. As a result, consistent with the purpose and the research questions, the interpretivism research paradigm has been selected to guide this study as it is the most congruent paradigm as follows:

This study maintains an interpretivist perspective which suggests that reality is socially constructed and seeks to understand how people perceive the world to gain insights into the phenomenon's value and meaning for the people (Bhattacherjee, 2012; Oates, 2006). Thus, there are no solid facts or truths about the world, but rather multiple subjective realities based on how different people view the world in their role. Consistently, this study seeks to understand e-learning use from the subjective perspectives consisting of the views, opinions and experiences of different students to produce multiple explanations. This contrasts with positivism which states

that the world exists independently of humans and as a result, observations can be made without making any reference to people's observations and interpretations. This approach suggests that the world is systematic and consistent and can subsequently be investigated objectively, resulting in generalisations which are converted into laws and facts (Bhattacherjee, 2012; Oates, 2006; Saunders et al., 2009).

Interpretivism studies individuals in their world, as it occurs in their social or natural setting, as opposed to the artificial world (Oates, 2006). Consistently, when studying the experiences of the students, it is done from the outlook of what exactly happens in their natural setting which is the e-learning environment, without any other external scenarios,r influences or manipulations of their natural learning process.

Interpretivism advocates that researchers are not detached from the research and are subjective and value-bound because their feelings, beliefs and values influence the research process and the outcomes thereof (Oates, 2006; Saunders et al., 2009). The researcher is expected to adopt an empathetic position and be able to recognize his/her influence on the study (Bhattacherjee, 2012). This differs from positivism where the researchers along with their personal feelings, beliefs and values, are expected to be completely detached from the research to maintain complete objectivity and be value-free (Bhattacherjee, 2012; Oates, 2006).

Interpretivist research has a strong preference towards using qualitative methods aimed at theory-building along with qualitative data collection and analysis techniques. The data encompasses different forms of non-numeric data such as words, images and metaphors of participants which provide an in-depth subjective understanding of the phenomenon of interest (Oates, 2006). This study employs qualitative methods which are described in detail in the sections to follow. Conversely, positivist research has a strong preference towards quantitative data collection and the application of mathematical models and statistical analysis (Oates, 2006).

Finally, this study follows an abductive research approach which is a combination of the deductive approach which is referred to as theory-testing and follows a top-down logic whereby conclusions are drawn from theoretical or logical reasoning; and the inductive approach which is aimed at theory-building and follows what is referred to as a bottom-up logic whereby conclusions are drawn from observed evidence (Awuzie & McDermott, 2017; Bhattacherjee, 2012; Saunders et al., 2009). This study employs the conceptual framework presented in section 3.4 as a conceptual lens to understand the various factors which may influence the effective use of e-learning for

educational achievement and subsequently provide further detail and explanations through the observed.

4.4 RESEARCH STRATEGY

Bhattacherjee (2012) indicates that studies which follow the criteria of the interpretivist research paradigm tend to be compatible with research strategies such as action research, ethnographies and case studies. Action research is transformative and interactive, in that it seeks to introduce change into a phenomenon and subsequently observe the effects of that change (Oates, 2006). Thus, action research is not compatible with this study because it does not observe any changes and the effects thereof. Ethnography, on the other hand, requires the researcher to be immersed in a specified culture over an extended period to engage, observe, and record the behaviour and intricacies of that culture (Oates, 2006). This research strategy is also not compatible, the researcher is not immersed in any culture because this study seeks to get an in-depth understanding of the views, opinions and experiences expressed by the students, without integrating the researcher into the e-learning environment. Conversely, a case study is designed to provide an in-depth and multi-faceted investigation of a phenomenon within the context of its natural or real-life settings using one or multiple sources of evidence (Yin, 2003). One of the core strengths of this research strategy is its ability to uncover unprecedented insights into diverse factors such as social, cultural, and political processes and relationships related to the phenomenon of interest, which may not be known beforehand (Oates, 2006). Thus, the case study research strategy is the most appropriate fit with this study as it seeks to undertake an intensive study into e-learning use to uncover rich, highly contextualised and more authentic interpretations thereof. Bhattacherjee (2012) has cited these facets as the core strengths of case studies, instead of just deriving generalisations or isolating specific factors to be studied. This further justifies why Saunders et al. (2009) postulated that this kind of research strategy is most often (not necessarily always) used in explanatory or exploratory research, which is consistent with this study which also has a descriptive element in addition to being exploratory.

Oates (2006) indicates that case studies can be used for theory-testing or theory-building, positivist or interpretivist research, which in this study is an interpretivist case study. Another benefit of such a design is that it provides a level of flexibility with the research questions, in that they can be modified during the research process, thus if the researcher finds certain aspects irrelevant, it is possible to do an update which according to Bhattacherjee (2012) is not possible with positivist research.

4.5 RESEARCH DESIGN

4.5.1 Unit of Analysis

Although case studies have been commended for their strength in studying a phenomenon from different perspectives and using multiple levels of analysis, this study only focuses on one unit of analysis, the individual level (Saunders et al., 2009). Furthermore, case research can either employ a single-case or multiple-case design, however, this study applies a single-case design of South African HE students who had to use e-learning as the primary mode for academic continuity. This single case design is ideal since Bhattacherjee (2012) has stated that it is more appropriate under unique circumstances which have had few considerations before or are understudied, for example, the unprecedented context in the case of the COVID-19 pandemic. Conversely, a multiple-case design has been characterised as more suitable for theory testing to establish generalisability.

4.5.2 Time Horizon

Case studies have different approaches to time and can either be longitudinal or cross-sectional studies. This study is interested in examining what is taking place at a point in time of academic continuity and subsequently follows the cross-sectional approach (Saunders et al., 2009).

4.5.3 Case Selection/Sampling

The selection is firstly guided by a non-probability sampling technique referred to as purposive sampling which is also referred to as judgmental, expert or subjective sampling and depends on the judgement of the researcher (Lavrakas, 2008; Patton, 2002). This selection technique selects respondents based on how they fit the inclusion criteria and characteristics of the study as guided by the purpose and research questions as opposed to other non-probability techniques such as convenience or quota sampling. The key inclusion criterion for this study was students who are able and willing to participate in the study and who met the following requirements:

- 18 years old and above;
- Enrolled in any South African higher education institution;
- Pursuing either undergraduate or postgraduate studies;
- Used e-learning as the primary mode for education during the non-contract classroom learning, as a manner of ensuring academic continuity due to the pandemic; and
- The modes of e-learning used in this study are those platforms or systems which are accessed by students and instructors, exclusively via the internet.

According to Bhattacherjee (2012), such sampling techniques cannot be generalised to the population which differs from probability sampling techniques such as random sampling. In addition to purposive sampling, snowball sampling was also applied where additional respondents were identified based on the recommendations made by those that met the purposive sampling selection (Saunders et al., 2009). The preliminary target was 12 South African HE students who were able and willing to participate in the study. The number 12 was selected in striving for saturation and sufficient diversity of interviewees in order to obtain broad findings to enable further analysis, this is upon the recommendation by Bobby (2016) who suggest the number 12 as an appropriate sample size for qualitative research .

4.5.4 Data Collection Methods

4.5.4.1 Selected Method

Bhattacherjee (2012) stated that case studies can employ one or multiple methods such as observations, documentation as well as interviews. Direct observations are not possible given the nature of e-learning; it is not something that can be physically observed as it takes place electronically. Similarly, the documentation method is not suitable for this study because it solely focused on the use of e-learning. Conversely, according to Oates (2006), interviews on the other hand, are most appropriate when the researcher seeks to obtain an in-depth and detailed level of information; where questions are complex or open-ended or where the order and logic thereof may vary for different individuals; emotions, feelings, and experiences cannot be explained or prescribed via questionnaires; and when investigating a unique, sensitive or privileged topic. This is consistent with the purpose of this study which seeks to gain an in-depth, rich and intricate view of factors hindering and enabling effective e-learning for academic continuity, which is aligned with some of the illustrations provided by Oates (2006). Thus, this study employs interviews as its primary and only method of data collection.

Furthermore, the semi-structured interview design has been selected over the structured and unstructured design because although the researcher as the interviewer has a list of questions based on themes extracted from literature and a conceptual framework, there is flexibility concerning changing the order of questions based on the conversation flows. Furthermore, semi-structured interviews permit the researcher to ask additional questions in cases where the interviewees bring up issues that the researcher had not previously prepared for. This allows the interviewees to speak in more detail on issues and provides them with an opportunity to bring in any new issues of their own which may be relevant to the initial themes of the study. This interview type is chosen over unstructured interviews to ensure that the researcher still maintains some

form of control over the interview and does not allow the interviewees to just speak endlessly (King, 2004). It is also chosen over structured interviews to allow interviewees to share their views, opinions and experiences or what Oates (2006) refers to as “speak their minds” as opposed to just using a checklist.

4.5.4.2 Interview Protocol Construction

The construction of the interview protocol for this study encompasses two key aspects which incorporate the essence of what this study seeks to address. The first aspect consists of formulating interview questions which are specifically aligned with the research questions as well as the concepts from the conceptual research framework presented earlier on in this section (Castillo-Montoya, 2016). These questions are intentional and necessary to get the interviewees to share their experiences, opinions and views on those specified questions. Secondly, since this study seeks to explore and describe effective e-learning for academic continuity amongst South African HE students, provision is made for conversational inquiry type of interview questions which promotes open conversations on undefined concepts (Castillo-Montoya, 2016).

Furthermore, the construction of the interview protocol structures the interview questions according to the four key types of questions described by Castillo-Montoya (2016) which consist of 1) Introductory questions which allow the interview to begin with easy and non-threatening questions; 2) Transition questions slowly shift the interview to the key questions or from one topic to another but still keep a conversational tone; 3) Key questions are the main questions of the interview and seek to solicit valuable information from the interviewees and are centred around the research questions; and finally 4) Closing questions, which consist of those that are easy to answer, those that allow the interviewees to raise anything that was not addressed and those that provide an opportunity for closure (Castillo-Montoya, 2016)., Refer to ***Appendix B*** for the interview protocol of this study which incorporates all the elements discussed above.

4.5.4.3 Contents of Interviews

The target was to conduct 12 semi-structured interviews of 30 to 45 minutes each. To avoid any schedule conflicts or challenges, as part of the agreement contract for the interview, the researcher ensured that the purpose of the interview and its duration were communicated beforehand. Additionally, the researcher scheduled enough time in case an interview ran over time and also made sure that the interviews were spaced on a specific day by following the recommendation made by Oats (2006) not to schedule more than three interviews in one day. Saunders et al. (2009) suggest that it is acceptable to negotiate exact starting times and provide

enough time and notice about the interview to ensure that the interviewees are not under too much pressure.

4.5.4.4 Mechanism of Interviews

Ideally, these interviews would occur on a face-to-face basis, however noting that South Africa still has cases of the COVID-19 virus, the interviews could not all be face-to-face. Thus, the only options available according to the literature are either telephonic or electronic interviews. Telephonic interviews have been cited by Oates (2006) to be cost-effective and not time-consuming but at the expense of losing social presence and personal contact; causing difficulties with the recording and could result in losing the attention and interest of the interviewee. This mechanism of conducting interviews was not preferred based on the nature of this study which required complete expression and sought to capture non-verbal and social cues which create rich data which would be lost if done telephonically. However, according to Saunders et al. (2009), electronic interviews such as those using real-time (synchronous) web conferencing are the next most effective method following face-to-face interviews, as they provide a platform for creating a personal presence where both the interviewer and interviewee can communicate and see each other via video. This kind of interview allows the interviewer to pick up the social cues of the interviewee and vice-versa, almost as in face-to-face interviewing. However, the potential issues that could have come into play such as compatibility software; a device with a camera and high bandwidth requirements; which the researcher factored into the selection of the final interviewees before the interviews took place (Saunders et al., 2009). Microsoft Teams was applied as the web conferencing platform.

4.5.4.5 Method of Recording

The interviews were recorded to avoid relying solely on the researcher's memory. This ensured that the researcher did not focus on writing down interviewees' responses which could disrupt the flow of the conversation and slow things down. Thus, recording the interviews provided a complete record of everything that was discussed while also allowing the researcher to concentrate on engaging the interviewees (Oates, 2006). Noting that these are electronic interviews, the researcher had to first obtain ethical approval to record from Microsoft Teams, which makes provision for recording functionality. The researcher made checks to ensure that the device had sufficient battery life before each interview. Noting the sensitive nature of this approach which could inhibit the responses of the interviewees, the researcher requested permission for this beforehand. Finally, immediately after the interview, the researcher wrote additional notes while the memory of the interview was still fresh.

4.6 DATA ANALYSIS

The outcome of the data collection process in the preceding section is qualitative data, which is text and non-numeric data that is consistently analysed using qualitative data analysis methods which differ significantly from quantitative analysis which relies heavily on statistical and mathematical techniques (Oates, 2006). Instead of predicting or explaining as with quantitative analysis, qualitative analysis is linked towards making sense of, and understanding a phenomenon which is consistent with the purpose of this study.

4.6.1.1 Transcription Process

The earlier section outlined that semi-structured interviews were the primary data collection method and were recorded alongside additional notes. Thus, before beginning the data analysis process, these recorded interviews were first transcribed into written form. Saunders et al. (2009) caution that the transcription process can be extremely time-consuming and to avoid pile-ups of recordings, the researcher transcribed the interviews soon after they occurred. Although there were options for paying a touch typist to transcribe the recordings on behalf of the researcher, it was more appropriate for the researcher to do it in order not to lose the richness of the data and as an opportunity to become familiar with the data. In order not to miss the richness of the content in the audio recordings, the transcripts were captured for the intonation, pitch and other non-verbal sounds as prescribed by Oates (2006). Each transcript was arranged according to the pseudo name of the interviewee, the date and time of the interview as well as the numbering of questions and responses to make it easy for the researcher to navigate between the different responses. Please refer to Appendix C for a sample transcript.

4.6.1.2 Data Analysis Method

Miles and Huberman (1994) indicate that there are three key approaches to data analysis, which can be either deductive, inductive or middle range. Deductive or top-down refers to those where the coding scheme is generated solely from literature, whereas inductive or bottom-up refers to those where the codes are extracted from the data without any prior reference to the literature (Saunders et al., 2009). Although this study follows an abductive research approach, it does not suggest that the data analysis would also automatically follow the inductive data analysis approach as well because the conceptual research framework presented in this paper plays a significant role in the data analysis process (King, 2004). Just as the conceptual research framework was used to guide the construction of the interview protocol, the coding in the analysis process refers to the themes or categories from the framework as well as those that emerge from

the data itself, thus the middle-range approach recommended by Miles and Huberman (1994) was best suited for this study. As a result, analysis methods such as the Grounded theory are not appropriate for this study, however, the Thematic analysis method somewhat combines both the deductive and inductive approaches to analysis where codes can be predetermined from literature as well as modified and added from the data (King, 2004). The Thematic analysis method is used to identify, analyse and infer patterns or themes in the data to establish what is referred to as a "framework of thematic" ideas (Gibbs, 2007).

4.6.1.3 Data Analysis Process

The analysis process in this study follows the six phases of thematic analysis outlined by Braun and Clarke (2006), who caution that it is not a linear process but is iterative and some phases occur concurrently. Phase 1, the starting point of the analysis process, began with the researcher getting familiar with the data by reading and re-reading it; going through notes; listening and re-listening to the recordings and; making initial observations (Braun & Clarke, 2006). Phase 2 commenced with coding, the formulation of brief and concise labels or codes that describe the key contents of the data which were relevant to *the a priori* themes from the conceptual research framework and research questions used to guide the analysis process. Braun and Clarke (2006) note that coding is not solely a data reduction technique but also analytical, extracting both semantic and conceptual aspects of the data. The researcher used this process to collate all the codes and align them with the applicable data extracts. In Phase 3, the researcher actively and deliberately searched for patterns or themes which are meaningful and relevant to the *a priori* themes and the study's research questions. The codes in the earlier section were vital in searching for themes in what could be considered as "coding the codes" to identify similarities in the data (Braun & Clarke, 2006). The outcome of this phase was to collate all the coded data to the relevant themes. In Phase 4, the researcher reviewed the themes by sense-checking themes against coded data, the complete dataset and the conceptual research framework. The researcher was required to reflect on whether the themes convey meaningful and convincing insights about the data (Braun & Clarke, 2006). This was an iterative process where the researcher needed to go back and forth with modifying, removing and discarding themes. In the next Phase (5) the researcher needed to formulate a comprehensive analysis of each theme to ascertain the essence thereof. And the final Phase (6) was the actual write-up of the report which involved integrating the analytic narrative with the data extracts to formulate a comprehensible story about the data and contextualise it according to the conceptual research framework (Braun & Clarke, 2006).

As the data analysis process progressed, the researcher applied interim summaries to document progress; the confidence level of meeting the research project timelines was assessed; and what the researcher would need to improve the quality of the data. The researcher also utilised self-memos to record any ideas that came to mind about aspects of the study, similar to what is referred to as a researcher's diary (Saunders et al., 2009).

4.7 RIGOUR

The following evaluation criteria were used to demonstrate rigour in this study which sought to explore and describe effective e-learning for academic continuity amongst South African HE students in the unprecedented context in which learning was taking place:

4.7.1 Dependability

The researcher has provided adequate details about the phenomenon of interest along with the social context in which it is immersed (Bhattacherjee, 2012). This has been demonstrated in the earlier sections of this paper that describe the background to the field of study the research problem and the purpose of the study, which provided adequate details about this study. The researcher has further documented the theoretical underpinning of the study which specifies that Sen's Capabilities Approach (CA) was employed as the theoretical lens of this study as well as the conceptual research framework. In addition, the research methodology has also been thoroughly documented along with the research paradigm, approach, strategy, and design which provides an audit trial of the entire process (Oates, 2006).

4.7.2 Credibility

Credibility in this study is demonstrated by data triangulation across research subjects by using two different sampling methods, which consisted of purposive sampling followed by snowball sampling (Oates, 2006). In addition, precise transcripts of the interviews were done after the interviews were concluded. The transcription process was complimented by the notes taken. Each transcript was arranged according to the pseudo name of the interviewee, the date and time of the interview as well as the numbering of questions and responses to make it easy to navigate between the different interviews and responses. The dependability criterion described above was also a key aspect of credibility, where an independent audit trail can be traced to the data collection and analysis processes if required.

4.7.3 Confirmability

Confirmability occurs after the participants have reviewed the final research report and confirmed whether they agree with the findings (Bhattacherjee, 2012). The dependability criterion described above also becomes an aspect of confirmability because the participants would need to go through the documented report to arrive at a decision. This confirmability will also be relevant for a research auditor (Oates, 2006).

4.7.4 Transferability

Transferability has been achieved by ensuring that the researcher provides rich, detailed descriptions of the research context or what is referred to as “thick descriptions”; along with the assumptions so that readers can independently judge whether the findings are transferable to other settings or which aspects can be transferred (Bhattacherjee, 2012).

4.8 ETHICAL CONSIDERATIONS

This study maintained the guidelines outlined by Rosenthal (1994) which outline the ethical considerations that need to be made during the three key facets of the research process which are: conducting the research, analysing the data, and reporting the findings. Participants of the study were informed about the nature of the study in the information participation letter presented in Appendix E. Additionally, all participants were required to provide consent, see Appendix F, Consent Form. This consent was required to participate; establish anonymity classification; to be recorded; and for the information provided to be used in an anonymised format after this project had ended, should it be necessary for other academic purposes. The study and researcher complied with all the ethical requirements of the University of the Witwatersrand; ethical clearance was provided before the study commenced, protocol number: CBUSE1965, see Appendix D, Ethics Clearance Certificate.

CHAPTER 5

5 FINDINGS

The data collection process was qualitative, which consists of text and non-numeric data that is usually analysed using qualitative data analysis methods which differ significantly from quantitative analysis which relies heavily on statistical and mathematical techniques (Oates, 2006). Instead of predicting or explaining as with quantitative analysis, the qualitative analysis focuses on making sense of and understanding a phenomenon which is consistent with the purpose of this study.

5.1 DATA COLLECTED – SEMI-STRUCTURED INTERVIEWS

12 semi-structured interviews with a duration of 30 to 45 minutes each were conducted; three were face-to-face, while nine took place via video conferencing using Microsoft Teams.

Table 8 below provides an overview of how the questions and sections are related to the research questions:

Table 9: *Interview Questions Breakdown*

Section	Concept	Question Number
Participant Background	The characteristics of the participants that were relevant to the study	*Q1 – Q4*
Resource/Commodity (e-learning system)	How e-learning was conducted for learning by South African HE students	*Q5 – Q9*
Factors enabling and hindering	How effective use of e-learning by South African HE students is hindered and enabled	*Q10 – Q11*
Personal conversion factors	How personal conversion factors influenced the effective use of e-learning	*Q12*
Social conversion factors	How social conversion factors influenced the effective use of e-learning	*Q13*
Environmental conversion factors	How environmental conversion factors influenced the effective use of e-learning	*Q14*
Technological conversion factors	How Technological conversion factors influenced the effective use of e-learning	*Q15*

5.2 PARTICIPANT BACKGROUND

A total of 15 students were invited to participate in this study and were selected using a combination of expert judgement and snowballing sampling methods. This specific sample size was selected upon the recommendation by Bobby (2016) who suggest the number 12 as an

appropriate sample size for qualitative research as well as Hennink and Kaiser (2022) who suggests that saturation can be obtained between the range of nine to seventeen interviews. Seven students were selected by the researcher based utilising expert sampling, students who meet the inclusion criteria of this study across five different HEIs in order to provide some diversity. These seven students were approached directly by the researcher who then shared the participant information sheet as an invitation to participate in the study. Six of the seven ended up participating while one did not participate due to technological challenges with interviewing software. Thereafter, the researcher applied the snowballing sampling method where eight additional students were identified based on the recommendations made by those that met the expert sampling selection. Six out of the eight participated while two pulled out due to scheduling conflicts; and an unforeseen family issue. Consequently, a total of 12 students were interviewed for this study. The participant background information is depicted in Table 8 below:

***Table 10**: Participant Background Information*

Measure	n=12	%
Age		
18-20	1	8.3
21-25	8	66.7
26-30	0	0
30-35	3	25
Higher Education Institution		
Stellenbosch University	1	8.3
Tshwane University of Technology	3	25
University of Pretoria	3	25
Rosebank College, Sunnyside Branch	1	8.3
University of Witwatersrand	3	25
University of Johannesburg	1	8.3
Level of Education		
Diploma	4	33.3
Bachelor of Commerce	3	25
Bachelor of Science	2	16.7
Master of Commerce	3	25
Primary method of learning before the pandemic		
Face-to-face/Contact Classes	12	100

The majority of participants fell within the age range 21-25 (66.7%), followed by 30-35 (25%) and lastly, 18-20 (8.3%). Additionally, the findings also revealed that the majority of participants (75%) who also represented the two youngest age categories depicted above, were all enrolled in full-time undergraduate programmes: 33.3% Diploma, 25% Bachelor of Commerce and 16.7% Bachelor of Science, while 25% were enrolled in a part-time postgraduate programme, specifically, Master of Commerce.

The participants interviewed were from six different HEIs from three different cities within South Africa, namely, Tshwane University of Technology, University of Pretoria, Rosebank College in Pretoria, University of Witwatersrand, University of Johannesburg in Johannesburg; and Stellenbosch University in Stellenbosch. Finally, all participants (100%) agreed that their primary mode of learning before the COVID-19 pandemic was face-to-face or contact learning which is significantly important as one of the key criteria of this study was to understand e-learning as a method for academic continuity where face-to-face learning is not an option due to unprecedented circumstances.

5.3 RESOURCE/COMMODITY (E-LEARNING SYSTEM)

This section presents the findings associated with the first objective which is to describe the use of the resource, e-learning, by South African HE and consequently answer RQ1: *How do South African HE students use e-learning?*

5.3.1 Which e-learning System do you use at your Higher Education Institution?

As part of describing how students use e-learning, it is important to first establish which e-learning system or tool they used at their respective HEIs to provide initial insights. This section focuses on depicting these findings.

5.3.1.1 System Types

50% of participants indicated that they used more than one system or tool for e-learning at their respective HEIs; while the other 50% used one centralised system for all their learning functions. For those that indicated that more than one system or tool was used, it was further revealed that each served a specific purpose. For instance, Microsoft Teams was a common video conferencing tool which was used specifically for live lectures and/or tutorial sessions; while university-proprietary web-based portals were used for other learning functions.

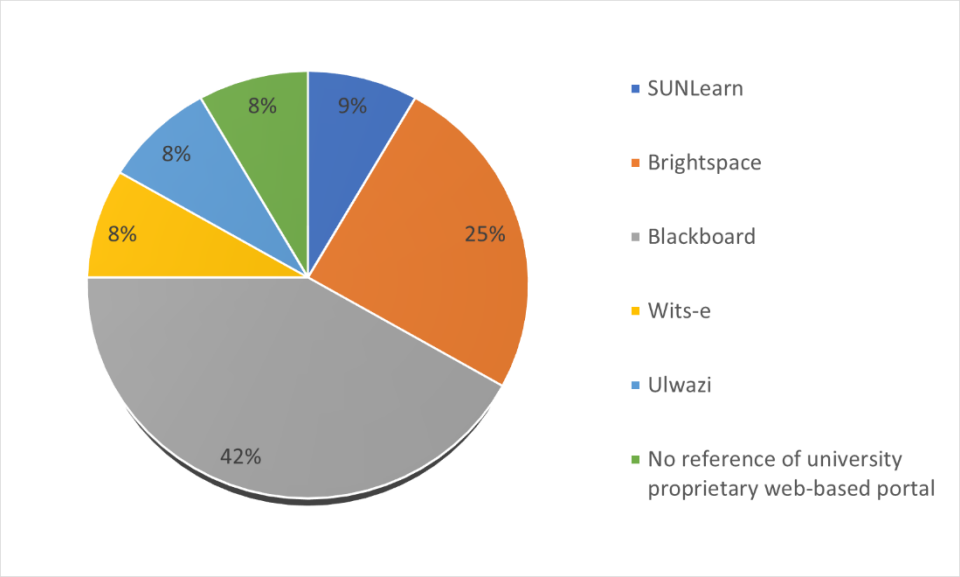


***Figure 2**: E-learning Systems used at HEIs*

Figure 2 above depicts the e-learning portals used by the participants from the respective HEIs. The only participant from Stellenbosch University noted that the portal used there was called SUNLearn, while the three at Tshwane University of Technology mentioned a portal referred to as Brightspace; the three at the University of Pretoria, the participant from Rosebank College and the one from the University of Johannesburg used Blackboard; and finally, the participant from the University of Witwatersrand indicated that eWits was used while another at the same institution referenced a portal called Ulwazi. Additionally, one participant further highlighted the social media platform, WhatsApp as a supplementary tool used in their e-learning experience, describing how it was used as a primary mode of communication amongst class members. The same participant went on to describe how student email was predominantly used as the key mode of communication between the HEI and students.

5.3.1.2 System Implementation

Three participants explicitly stated that the e-learning system which they switched to for academic continuity was already in use before the pandemic. The key differentiating factor in these cases was the scope in which the e-learning systems were previously used, all of which did not include being the primary platform for lectures. This is outlined below in the following responses:

"So there wasn't really a new system put in place, UP had already started kind of going into the whole hybrid learning. So we already had an online system where like they would upload a lot of our.. what is it.. notes slides and like introductory lectures we'd have to watch before class before the actual contact classes start." - STU09F

Conversely, one student explicitly indicated that the system was something completely new and introduced due to the pandemic:

".. so it was completely new, something we have never been… something we never been like accustomed to..." - STU06M

5.3.2 How do you access the E-Learning System? Which resources do you use?

Another aspect applied in describing how students used e-learning is in understanding how they access it or rather, which resources are required to access it. These findings are outlined in this section and depicted in Figure 3 below.

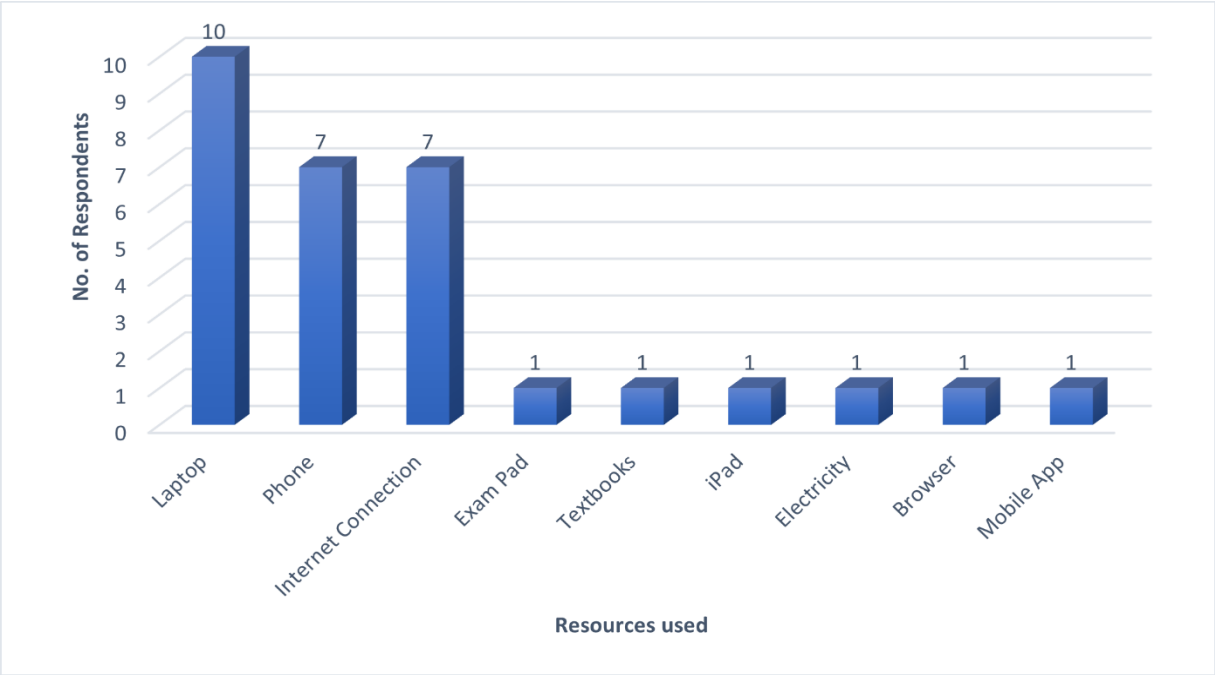


***Figure 3**: Resources used in E-learning*

5.3.2.1 Electronic Devices

Electronic devices were identified as the category mainly used to access e-learning, with the laptop specifically found to be the top resource used with 83.3% of participants agreeing to use it. One participant explained why:

"It's more intuitive to use the laptop and everything is just, it's easier to work from." – STU6M

Moreover, one of the postgraduate students who was working and studying part-time described that the laptop that they used, was a work laptop. However, one undergraduate student described

that their HEI lent a laptop to students who could not afford one, upon receiving the necessary motivation from the student's parents:

"OK, so basically if you couldn't, OK... if you couldn't afford a laptop, they would give you a laptop, a modem, and a SIM card. But for that you have to bring a letter that stated that you couldn't afford, and you know.. Take your parents' payslips to prove that you couldn't afford a laptop and they borrow you one, which you would return at the end of the year and the modem and the sim card and 10 gig per month." – STU07M

Six respondents out of the 83.3% that specified that they primarily used laptops, indicated that cell phones were used as secondary devices to the laptop as explained by participants below:

"… the phone was just convenient for like notifications and like checking marks. But if it got deep then you use laptop" – STU08F

Conversely, out of all 12 participants, only one indicated that their cell phone was used as the sole device to access e-learning:

"Cause, I feel like it's a bit uhm complicated to use a laptop." – STU02

And finally, another participant indicated that in addition to the laptop and cell phone, they would use an iPad as well.

5.3.2.2 Internet Connection

Followed by electronic devices, internet connection was cited as the second resource used by 58.3% of participants, who classified its delivery through either data or Wi-Fi. A noteworthy insight revealed was that some HEIs allocated data to students as explained below:

"So we also had data allocated to us students. So to use those resources, although it wasn't enough, but they still gave us some data to use."- Stu08F

Furthermore, one participant described how their respective HEI allocated data for the first month of the switch to e-learning and then subsequently supplied students with sim cards of a specific data service provider:

"At first, they sent us data, like the first month they sent us, and then the second month we went to school to collect Telkom sim cards and then they had like.. the first month, I think they had like 20 gigs, or it was a lot, I don't remember the amount but the first month was a lot. The first semester, it was a lot and then when we transition to the second semester, they cut it by half, or they give us then 10 gigs of data.." – STU07M

Finally, the same participant, STU07M further suggested that the e-learning portal used at their HEI did not consume data when connecting through the very same service provider referenced above:

"Yeah, well, and the Rosebank portal, apparently, when you use Telkom it didn't require data that's why this…you just need good data to log in once you've logged in, they claimed it didn't use any data." – STU07M

5.3.2.3 Other Resources

In addition to electronic devices and an internet connection, one participant described how other resources such as exam pads and textbooks were used as part of their learning experience; explaining how their resourcing requirements remained the same as the pre-pandemic learning with the only exception being the lecturer going from physical to online:

"So the only thing that was different here was like it was my laptop and not the actual lecturer."- STU01M

Additionally, one student highlighted the HEI mobile application as the resource used to access marks and announcements; while another student specifically referenced a browser. Finally, another resource that was identified for accessing e-learning was electricity, with one participant exclaiming how significant it was.

5.3.3 When do you use e-learning?

The third aspect applied in describing how students use e-learning is in understanding when they access it, the findings thereof are depicted in this section and summarised in Figure 4 below.

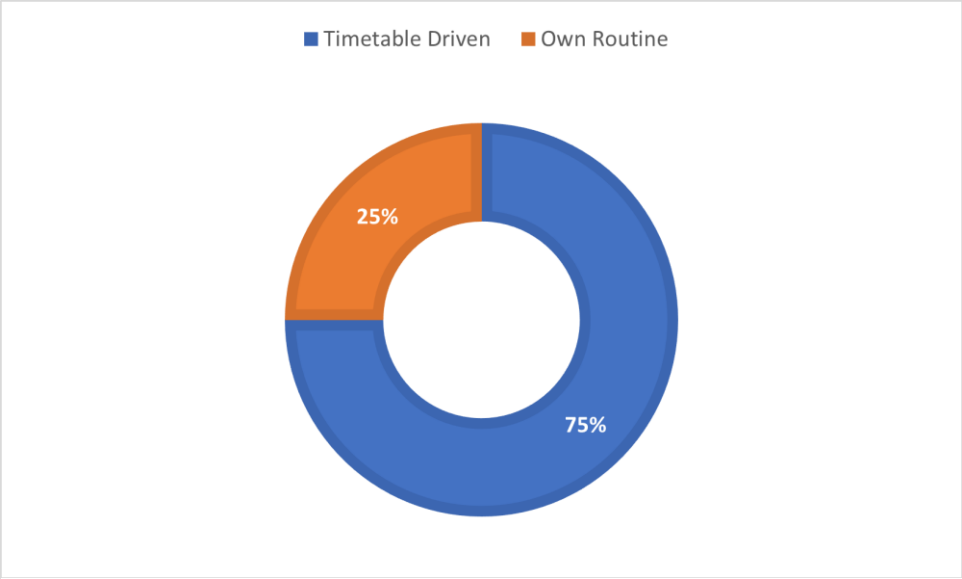


***Figure 4**: E-learning Schedule*

5.3.3.1 Timetable Driven

The findings demonstrated that most participants (75%) followed the timetable that was provided by their HEIs. These participants agreed that their class attendance was aligned with the time

scheduled for the respective classes during a specific day, which was described to fall mostly in the mornings and afternoons. See responses from participants below:

"Sometimes it's in the morning and sometimes we don't have classes at all and sometimes it could be between 12:00 and 14:00." – STU02F

Further:

"We follow the campus timetable, the same timetable we are using before COVID. If you had a class at 8 before COVID, you still have a class at 08:00." – STU07M

This finding is consistent with those who were enrolled in part-time postgraduate programmes, as three participants explained that even their evening online lectures still occurred at the same time as the previous face-to-face on-campus lectures.

Conversely, two participants acknowledged that although classes were timetable driven, that specific HEI revised the timetables and new class schedules were provided when the switch to e-learning transpired. These participants further elaborated that the timetable revisions forced a change in their previous, pre-pandemic routine whereby they attended classes solely in the afternoon but then had to attend in the morning and afternoon due to a reduction in class options provided due to the e-learning revision:

"So second year, there were quite a few options for classes, so one could choose for most lectures to attend in the afternoon or morning. So I'd normally studying the morning and attend lectures in the afternoon."- STU05M

The findings also revealed that some (33.3%) participants used the evenings as a period to do self-study, while one participant indicated that in addition to using evenings to study, it was also used as a time to catch up on recorded lectures that they may have missed during the day:

"so during the day live classes and in the evening if there were any recordings or things that I had missed, then I would do them then. Studying in the evening as well." – STU09F

5.3.3.2 Own Routine

Conversely, three participants (25%) indicated that they did not follow a timetable approach but rather established their own routine which they exclaimed mimicked their pre-pandemic routine as much as possible:

"I would wake up every morning at 6:30, then obviously do my.. I have my breakfast, and then at 8:00 o'clock that during the pandemic, I'll start working at 9:00. O'clock. Right. So I would start at 9:00 AM. And what I.. what I would do is that I would, I would separate each subject per day. I would do the whole week's work of the one subject, including

the tutorials be done with that one subject, then Tuesday with the onto the next subject and the Wednesday until the next subject. Just to sort of get that that structure during.. Yeah, during the during the e-learning period." - STU01M

Further:

"The way I approached it was more so like nothing changed in terms of like my schedule. So I'll just get up the same time as I would on a normal day and then the thing that made it, I think easiest was we used to have like one module per day." - STU06M

5.3.4 What kind of information is delivered through e-learning platforms?

Another aspect applied in describing how students use e-learning is in understanding the kind of information that is delivered through e-learning, which is summarised in Figure 5 below.

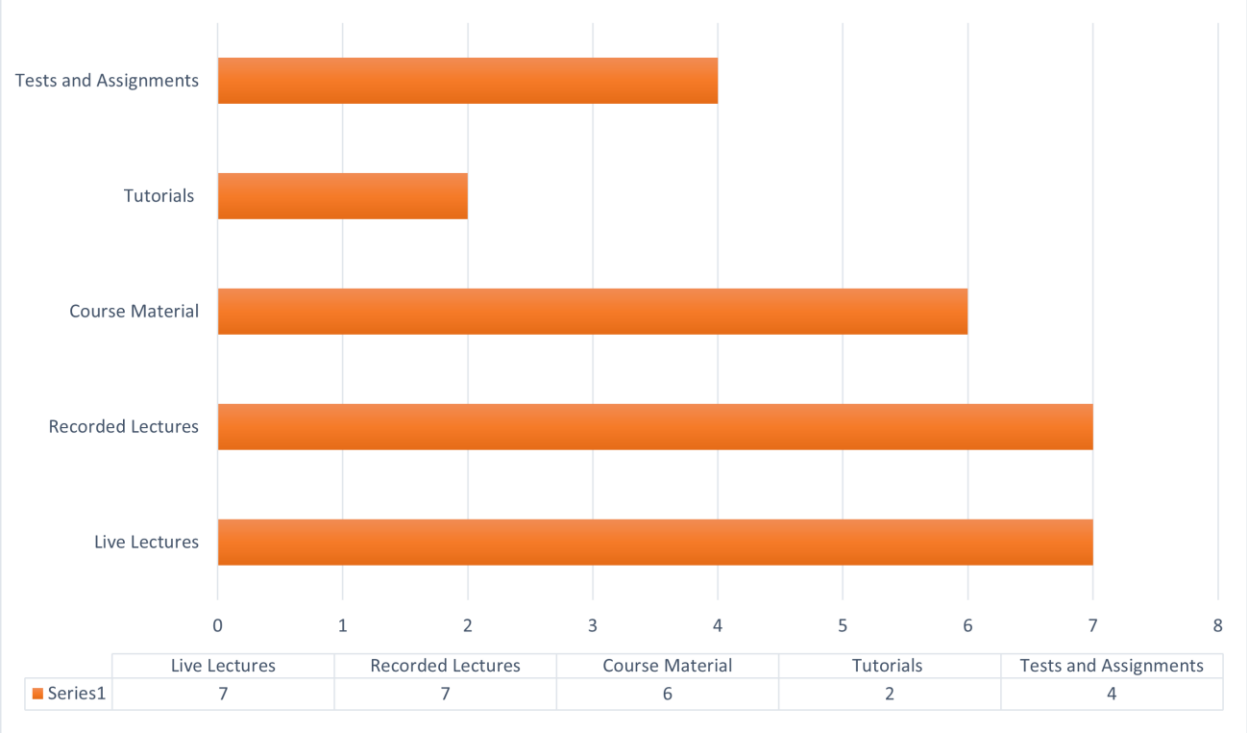


***Figure 5**: Information Delivered Through E-learning*

5.3.4.1 Lecture

The majority (58.3%) of participants were in agreement that live or real-time lectures were one of the key categories of information delivered through e-learning. Moreover, two students explicitly indicated that during these live lectures, lecturers would present slides; while another student indicated that the lecturers would utilize the Whiteboard functionality of Microsoft Teams to

present lecture notes. Conversely, the findings also revealed that only three participants relied solely on pre-recorded lectures, while four participants out of the 58.3% that previously mentioned that they accessed live lectures, further advised that they also accessed pre-recorded lectures to catch up or as a revision. This is outlined by the participant below:

"We just logged in, you attended class and then all the all the lessons were recorded, some lessons were recorded during my class and then some would recorded during other students classes. So every lesson, every week, every module was recorded, categorized and sorted. Week one, week two week three, so you could always go back and check which in my opinion was better than normal class because there's no going back in time" – STU07M

Additionally, one student highlighted that the availability of the recorded lectures was determined by the willingness of the specific lecturers:

"Sometimes you would find lecturers who would be willing to record the sessions. And after they record those sessions then they would be uploaded to eWits." – STU10F

5.3.4.2 Course Material

Many participants (50%) mentioned accessing slides through e-learning as a separate point. Additionally, other course-related material such as past papers, study guides, links, notes, worksheets, extra videos, preparatory material, articles, discussion boards, links to YouTube videos, sites and any other material lecturers felt was necessary for learning were described by 50% of participants. Furthermore, one student referred to textbooks also being key material accessed, which was available online via an app at their respective HEI, where students would use that specialised app to access and download textbooks.

5.3.4.3 Tutorials

Tutorial-related material was also identified as an additional category of information delivered through e-learning, with two participants from two different institutions detailing a consistent delivery pattern consisting of tutorials encompassing a list of questions given to students; and interactive tutorial sessions held to go through the student answers, with the administration of a tutor or teaching assistant:

"The tutorial test, so after each tutorial that you've worked through, there's like a little test that they give to you, right this test that they give to you right after the tutorial that we have maybe like 2 hours to complete, then you submit that… So after the tutorial that the little a little test on the tutorial and then that would be for marks." – STU01M

5.3.4.4 Tests and Assignments

Information linked to tests and assignments (four participants) was also identified to be accessed through e-learning. Such information would entail the test and assignment specifications (scope

and rules), how to access these with respective access codes, feedback and marks of the class and individuals. Additionally, the e-learning systems were also used as the platform whereby these tests would be appraised; and assignments submitted and evaluated for plagiarism through Turnitin. Finally, one student stated that impromptu pop-up tests would appear in the middle of a lecture to verify whether students were paying attention:

"There were these things they would display like mini tests to see if you were paying attention." - Stu07M

5.3.5 From which location/setting do you access it?

The final aspect in describing students' use of e-learning, is in understanding where they access it from, the findings thereof are depicted in this section.

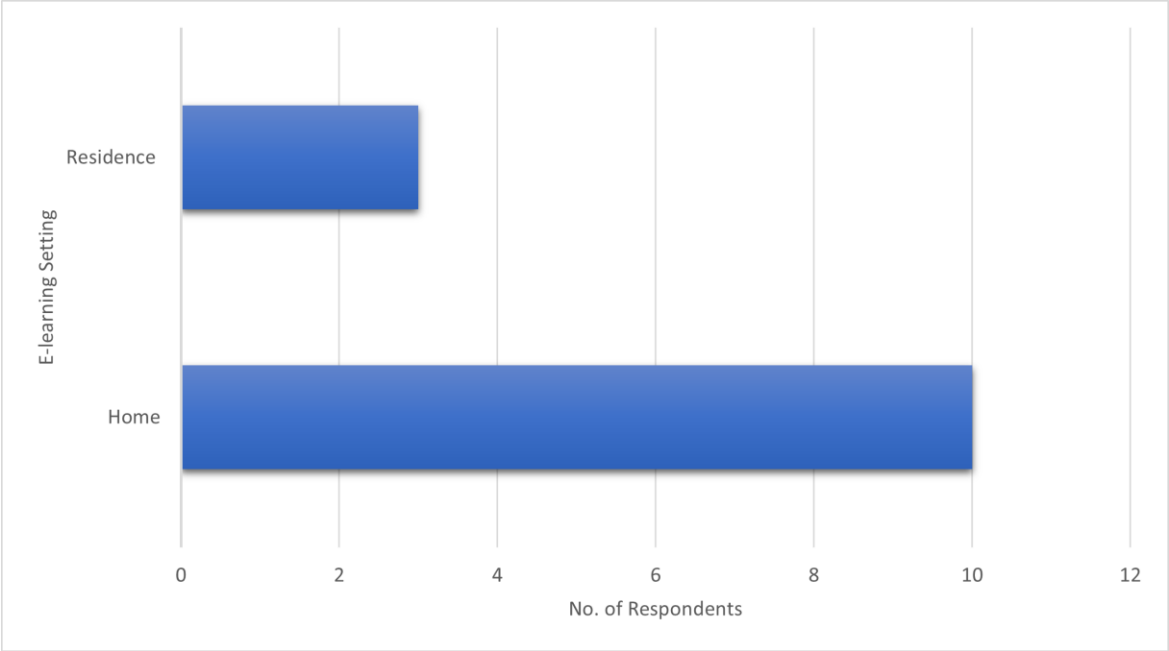


Figure 6: *E-learning Location*

5.3.5.1 Home

The majority of participants (83.3%) indicated that they accessed e-learning from their homes. This notion was described by one respondent below:

"The thing is, it happened right when, you know, COVID was like, you know, dominant. And it had just started. So even there were restrictions in terms of movement. So it was always home. And restaurants are closed. So I couldn't even be at, like, going to a Spur or a Mugg n Been or anything like that. So yeah." - STU09F

The findings also revealed that two participants that lived in HEI residences were asked to leave their residences and go home:

"At the beginning of the pandemic, we are forced to move back home since I was in the Tuks residence. So for the first month or so I was working from home…" - STU06M

However, some exemptions were provided to students who could not do their e-learning from home citing either inconducive home environments or foreign students who could not return to their countries:

"So I actually moved back home during the.. the.. the pandemic because we weren't really allowed on campus, right? Only people who needed to be on campus were got to.. like let's say your home environment wasn't like a space where you could do sort of study then you would have to sort of even have like a motivation and you know apply to get to go back.." - STU01M

Further:

"… just students that could not really go back to their countries. They would, they would use these resident spaces for them. Yeah. So there's that. Let's say at home, you didn't have access to you know, like a a space where you could actually work. Yeah. So they would. So these.. these were the type of students that would were allowed to stay on campus..." - STU01M

5.3.5.2 HEI Residence

25% indicated that they accessed their e-learning from their HEI residences; this included one participant that was accounted for at two different settings due to moving between their home and residence. In addition, two students cited that they would make use of different areas at their residences, one motivated by the Wi-Fi connection strength and the other, by productivity:

"uhm no, mostly I just.. I am always in my room cause the Wi-Fi connects.. okay sometimes.. and then if not then we just go to the multipurpose, the Wi-Fi is good there." – STU02F

Further:

".. then once we were allowed back in res, there were a few study areas at the residence I was living at, so that is where I did most of my studying since the library was closed off for most of that year.

5.4 CONVERSION FACTORS

The conceptual framework of this study stipulates that the extent to which students can generate capabilities from e-learning is influenced by conversion factors which have been categorised

under personal, social, environmental as well as technological factors. Therefore, this section provides the detailed thematic findings on the third objective of this study which is to describe how personal, social, environmental and technological conversion factors influence the effective use of e-learning and consequently, answer RQ2: *How do personal, social, environmental* and technological *conversion factors influence the effective use of e-learning?*

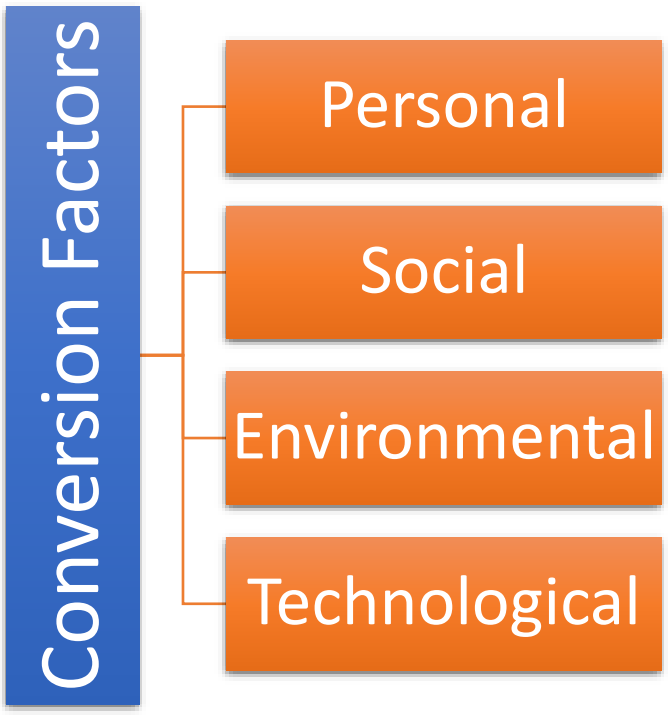


Figure 7: *Categories of Conversion Factors Influencing the Effective use of E-learning*

5.4.1 Personal Conversion Factors

The themes identified under the personal conversion factors are concentration span; procrastination; autonomy or behavioural control; mental health; motivation; and physical health.



***Figure 8**: Personal Conversion Factors Influencing the Effective use of E-learning*

5.4.1.1 Concentration Span

Some participants (41.7%) indicated that their low concentration span influenced their ability to use e-learning effectively; this finding had a divide in terms of the direction of the influence. Firstly, two participants stipulated that their low concentration span was enhanced by the lack of physical or social presence which was removed through e-learning, especially as most lectures did not require cameras to be switched on:

"I think the biggest issue that I have is that even though I had mentioned before that I personally enjoyed the distance learning, but the biggest issue that I have with myself is that my concentration span is very limited. So being on a call and the lecturer is going on and on about statistical analysis and how to do the Chromebox alpha and whatnot some way, I end up being on my phone and I'm on Twitter and I'm on umm, you know you tick tocks. So concentration span is very limited. So every now and then I need to be able to sort of like see the person just so that get that wake up to say yay we end like a classroom situation. So with the distant learning especially with our cameras being off I was able to get away with being like on my phone and then later on it would result in meeting struggling because I had missed a certain part of that lecture because I was not in that lecture mentally, so yeah." - Stu010F

Two other participants outlined how pre-recorded lectures, which were now available via e-learning, made it possible to work around their low concentration span. This was possible because

students had the option of revisiting or rewinding the recordings. One participant explained this notion below:

"OK, I'm the one that came to mind, like immediately when you mentioned that is I noticed like in the live lectures, one thing about me is I used to zone out a lot. So I'd probably like miss out on a good 60/70% of the lecture because I'm not not necessary I'm not concentrating, but then I find it really hard. Like I could look at the lecture, right and then I'll be like, OK, yeah, he's saying this, this, that and then five minutes later I find that that will not paying attention to anything he said… So then I think with the e-learning and specially the the fact that the things were pre-recorded, if I did find myself in a situation where I did zone out, there's always that ability to just like come go back and then yeah. So I think that really did help mitigate that part of myself where I just cannot focus or as much as I do want to focus. It's just I don't know it's something to get looked at but then yeah." - Stu06M

5.4.1.2 Procrastination

Procrastination was amongst the top categories that affected 41.7% of the participants' ability to use e-learning effectively. It is noteworthy that 33.3% referenced from a negative or limiting perspective; while one participant referenced procrastination from a more positive perspective.

One participant indicated that anxiety was a cause of their procrastinating:

"And the anxiety as well would actually make me, you know, procrastinate in a sense, I always just wanted to sleep..." - Stu09F

From a positive perspective, one student explained how the transition to e-learning assisted in overcoming a historical challenge with procrastination:

"I think also the issue of procrastination. I used to be someone that procrastinated a lot, but then I'm once you have a situation where you have all this freedom right you it's… it's almost like you owe it to yourself to be able to structure your life in a way because you have all these goals and all that. And then as much as you do want to, like, lay back and all that when you have all this, like they used to like, dump all these things on us so it puts in a place where you get to like plan and then not necessarily work at at goes back to pacing as well. You get to plan and then you get to put yourself in a situation where you work in the best way possible for yourself. So in the sense that you get to schedule your stuff in the way that you know that you will be able to handle and then I think that does take away the fact the.. the procrastination side because then you realize that this is something that you're setting for yourself. So you have no excuse to like, not perform." - Stu06M

5.4.1.3 Student Autonomy

Student autonomy was identified as another personal factor influencing the effective use of e-learning by 33.3% of participants. Interestingly, participants suggested that these traits were heightened by the nature of e-learning itself where students felt that they were necessary to conquer. This concept is depicted in the responses below:

"Yeah, you become more responsible as well. And yeah, cause you do tend to like, I don't know like get laid back, especially when you have a lecturer who's telling you that. OK, you have this, do you do you who's, like, almost handholding to some extent so when you take that away, you you do need to like, take responsibility and take accountability for your actions and when when you, when you're a person, that sets goals, that does really like motivate you to like work harder and just and just pull up your pants, really pull up your socks, whatever the reference is." - Stu06M

Further:

"With e-learning it was just you, your question and your study material. So you had to focus because some teachers, you know, they didn't put enough effort. Not all teachers were great, so the ones that didn't put any effort, they pushed me to learn how to teach myself. So it was a skill that I learned from COVID: how to self-learn or how to self-teach."- Stu07M

5.4.1.4 Mental Health

Mental health was also depicted by three participants to have played a role in the e-learning effectiveness, from a negative perspective. One of the three students indicated that the cause of the mental health was grief, the death of a family member as explained below:

"Hmm. OK, there was one that I did experience, so it was emotionally in.. what's the year now? 2022, 2021. Yeah, 2020 around August, September, October towards the.. the final exams I went through a lot emotionally I lost my nephew just after birth mm, so that really did hinder me in the sense that like.. you know, the isolation of like e-learning, you don't have anyone to really talk to. Everyone's going through their own thing and you're kind of stuck at home with these emotions and then you have to learn and you have to gather all this material and you kind of feel.. I don't know what the word is like. I don't know how to explain it like.. I've already used the word isolation but Caged in a sense" - Stu010F

The student further elaborated on this:

"The other thing was that OK, so I had very high stress and depression towards the end of my.. and I kind of felt the.. what is it, the symptoms kind of creeping back on me in the first exams, obviously just after the pandemic hits now it's like, you know, exam time and I'm like, OK, this is new." - Stu010F

5.4.1.5 Motivation

The findings revealed that two participants indicated that their motivation had a positive influence on their ability to use e-learning effectively. See the concept below from one of the participants:

"I think it was probably resilience, the drive to complete what I've started and just wanting, this and so regardless of the challenges maybe of e-learning that something is new, it's also a matter of you know.. the only thing that is guaranteed or constant is change. So with the pandemic and e-learning somehow you know.. made that narrative to evident so it was a matter of just, you know, adjusting because you can push back and say I'm not gonna take this course over e-learning, but how long do you.. Am I gonna wait before we go back to contact classes? Because nothing was certain

at that time, so yeah, I think it was just it... It boiled down to just resilience yeah, just pushing forward to completing what you started and just the desire to really get this." - Stu08F

5.4.1.6 Physical Health

Finally, one student outlined compromised physical health in the form of carpal tunnel syndrome that influenced their ability to use e-learning effectively. The student described how muscle pain and numbness in his/her hand made it hard to learn on some days.

5.4.2 Social Conversion Factors

The themes identified under the social conversion factors which influence the effective use of e-learning are home versus learning responsibilities; social presence and interaction; student politics; peer support; corruption; and economic status.



Figure 9: *Social Conversion Factors Influencing the Effective use of E-learning*

5.4.2.1 Home vs. Learning Responsibilities

The findings on understanding how social factors influenced students' ability to use e-learning effectively, revealed that conflict between home responsibilities versus responsibilities of being a student was identified by many students (50%) who indicated that they lived at home.

Four participants described how the hierarchical set-up in their homes which required children or young members of the family to perform various chores, was specifically brought into enquiry given that they were now learning from home:

"Umm also like I think when you get home as well like you.. you when you get home you expect it to like cook you expect to clean you expected to do sort of all these things. I'm not sure if that that can be considered as some sort of social factors you know but like when you when you are when you're sort of doing e-learning it it's sort of assumed that you can also take on these other responsibilities because now you learn your online you don't have to be in classes you don't have to be in these spaces you know." - Stu01M

Further, another student outlined the generation gap as playing a significant role in their e-learning:

"My only like social environment that I'd say actually impacted my learning was probably the fact that I was home majority of the time, and you know the concept of you know, I'm in school even though I'm at home is something that, you know, the older generation doesn't really understand." - Stu09F

Two participants described the added expectations placed on females stemming from gender roles established in families. One student explained:

"So yeah, it's it was literally just that the fact that you know I'm a girl, I'm at home, I should be taking care be taking care of of the people around me." - Stu09F

Still on the notion of gender roles, an interesting insight from a student who is also a mother and how that influenced her e-learning experience:

"Now that I'm thinking about it as a mother of three, then you've got kids who are coming in and out while you are in a session. So that very disturbing as well so…" – Stu10F

Conversely, two participants described that their home environment and social set-up fostered more support and enabled them to focus on their studies:

"I was fortunate enough that when I had class, my parents and my grandma always gave me that freedom to do to say no "you're busy with school". It can wait, someone else will do it. You know that protection you get when they say.. let's say it was my turn to clean the dishes and since I'm attending class someone else was forced to do the dishes and I could just focus on school." - Stu02M

Further:

"You think that we will count in my own space in a sense of you know when you home as a child with your parents, you have so many chores to do and then school maybe might be secondary or like it's not that much of a priority. So I'm in my own space, the environment allows or fosters or supports my studying." - Stu08F

5.4.2.2 Social Presence and Interaction

25% of participants indicated that the lack of social interaction and isolation experienced through the e-learning arrangement had a significant impact on their ability to use e-learning effectively:

"OK, I was saying that for me personally, not being in the classroom had a.. you know, you know, when you an extrovert, you get energy from being with people. Yeah, so I lost out on that energy, that excitement of going to school. You know, seeing the people there. Competing with your rivals, you know to give that answer. You know I missed out on that.

When you're at home and then they ask a question on Blackboard, even sometimes when you know the answer, the whole process of responding, you have to grab a mouse click, raise your hand, it's a whole effort." - Stu07M

Further:

"Umm, so that's one like personal factor that that e-learning did help with, but that in terms of am that e-learning hindered umm, I think the social, the social part. I'm someone that enjoys like company and all that so when I found myself alone, I think it did. It did take a toll on me. Like, I'm like, just general happiness was just not there. It felt more like a chore, cause it's fun to like, like group work. I really do. What the group work a lot but then when you take away that, like face to face, factor as much as yes, you did have your WhatsApp groups and your live sessions, whatever. But then that factor where like if somebody next to you get to discuss all this all that. I think that did take away taking away that that did take a toll of me and I did find myself like um unhappy most of the time and just generally in not in good headspace I would say."- Stu06M

Conversely, one participant suggested that she socialised too much with her boyfriend and friends which consequently had a negative influence.

5.4.2.3 Politics

25% of participants indicated that student politics influenced their ability to learn effectively. Two students made specific attribution to the disruptions such as strikes and voting campaigns organised by these political organizations:

"Well, politics, I'd say that politics well from for me it did personally affected my studies and I think it would be the same for other people since the normally be an election of some sort. So either for SRC or a lot of these organizations, student organizations, and those people would normally campaign go door to door. They go door to door at residences. When people in the library. So I feel like that is a distraction to people." - Stu05M

Another student described how the direct involvement of being a member of a student political party took a lot of time away from e-learning.

Finally, South Africa as a war-free zone was mentioned as a factor which positively influenced students:

"So I don't know if they'll be part of this, but those were some of the stuff which made it easy or possible like from an environment point of view, so it wasn't even like that I'm in a war zone, so I was also in a place or an area or a country where it allowed for me to focus on my studies and not worry about, you know, certain things" - Stu08M

5.4.2.4 Peer Support

Three participants highlighted the influence of peer support on their ability to use e-learning effectively, all three in different contexts. One outlined how their university did not provide the necessary support to students in the transition to e-learning which resulted in students who did not have the means, falling behind. As a result, the student community started their own movement to advocate for such students:

"We had this thing where we don't we don't wanna leave this. There was this movement that we had where no one is being left behind you know so it was sort of like no one is learning." - Stu01M

Another student also cited peer support from a positive perspective whereby classmates supported each other through the use of WhatsApp groups which played a significant role:

"I don't know if it would be societal or would it be environmental in terms of you know, the having people like in class you know peers that you can share your experiences with, reach out to if you're having any challenges, you know the WhatsApp group you could like just post they so as like sort of an informal support group in a way because you check in and just see if are you drowning alone or is someone in the same boat as you, has someone overcame, and then shared experiences, so that too. Although I don't know what I'll call it that played a role, you know, a good one." - Stu08F

And finally, the third participant cited how having a hyper-social friend group resulted in a negative influence on their e-learning process, serving as a major distraction.

5.4.2.5 Corruption

Two participants identified corruption as another social factor influencing the effective use of e-learning, specifically in the context of governmental resources that were provided to aid the transition to e-learning. One student explained further:

"So with regards to corruption. We know that a lot of money was lost through the parastatals, so that made it difficult for us to have electricity for one. Another thing would be people actually having devices, even the quality of devices they received once for, for those lucky enough to get them, they were bad due to the corruption. So those things really affected the online learning." - Stu05M

5.4.2.6 Economic Status

The findings also revealed that economic status also influenced effective e-learning, specifically those who came from disadvantaged backgrounds and who had their streams of income reduced due to the pandemic as outlined below:

"I think another societal factor would be people's circumstances. So we live in South Africa. It is really high in employment rate and many people that you would meet come from disadvantaged backgrounds. So because of that quite a few people had to send money back home to assist. Some people had to work on the side, start business on the side of which definitely does take away time that one would have for studies. So, and you're working online becomes more difficult now since Uh, it's not necessarily the online learning aspect of things, but rather because of the.. the lockdown associated with it since because of the lockdown, people were able to go out and it was basically made it more difficult for them to make money, which meant that for those that were lucky enough to have bursaries, they at least they were still able to send some money back home. But for those that did not have bursaries were reliant on them going out and looking for money making. The money it was difficult for them to sustain themselves and also help out at home." - Stu05M

5.4.3 Environmental Conversion Factors

The themes identified under environmental conversion factors which influence the effective use of e-learning are electricity; learning environment; ICT infrastructure; organisational support; and weather.

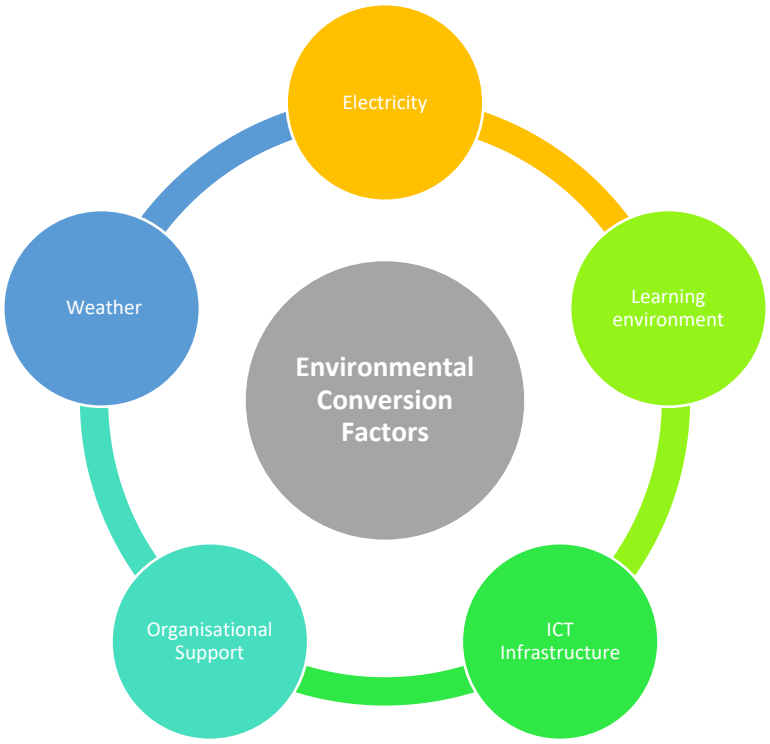


***Figure 10**: Environmental Conversion Factors Influencing the Effective use of E-learning*

5.4.3.1 Electricity

Most of the students (83.3%) indicated that electricity was the top environmental factor that influenced their ability to use e-learning effectively. There was a consistent theme that electricity or rather, the lack thereof through load-shedding disrupted the learning process. This is depicted in some of the responses below:

"so okay.. okay let me just start from last year because I used e-learning the most. Last year, it was difficult for me to access e-learning because if you don't have electricity, there is nowhere you can go to, unless you go to campus of which our access to campus was limited." - Stu01M

Further:

"… but like electricity, because we need to have my device is fully charged, I need to have like internet connectivity. So those, you know, like played a huge role." - Stu08F

Further:

"the most obvious one was probably the load-shedding… It kind of decided it's gonna give itself power at the beginning of the pandemic, was one of them because you know, when you have to like, attend the class. I know I had a problem between 8:00 and 12:00 in the mornings, cause that's generally when my section would hit.. or would have load-shedding, sorry. And I wouldn't be able to connect to lectures, and sometimes the lectures wouldn't want to record the sessions, so it was kind of like a back and forth pushing pull kind of thing, so there was that and then."- Stu09F

Of all the participants that cited electricity, only one indicated that they were not affected negatively by it due to having access to a generator which kicked in as backup power.

5.4.3.2 Learning Environment

Findings revealed that the home environment in which students lived was the second highest (66.7%) ranked category of environmental factors that influenced their ability to use e-learning effectively. Of these participants, five indicated that they experienced high levels of noise which was a major distraction to their learning experience.

One student cited the positioning of their home, which was on the main road, as a source of the noise experienced:

"OK, I'm OK, um truthfully, well, most of the time, though. The only environmental factor I had was I live on the main road, so there was taxis "peep-peep". I'm sure even now, you'll hear in few minutes, or you'll hear some sound in the background. There's always some sounds at my house." - Stu07M

The student further cited peak time busyness as an enhancement to the noise already experienced:

"Yeah. So that's the main factor I faced personally cause.. and during, especially during late classes where you find that people, people are coming back from work, so there's always noise. So even when I.. if I tried to answer, my recordings were always busy, so I didn't answer that much during those times." - Stu07M

Conversely, another participant explained that the HEI residence was also noisy:

"Uh, going to Res, the environment there, it was better than not everyone goes to University to learn so with Res, you'd find that most people were, they would make noise, they would be there for their attention, which would really be distracting for people who actually there to study. And I think that was also another issue." - Stu05M

Additionally, one student further attributed the noise levels to the housing types which in this case were complex or apartment blocks as well as townships:

"Umm, sure, didn't really experience much, but what I can't speak about. Luckily I didn't really experience it, but it was one of those things that I had at the back of my mind because with the whole studying and being just well through distant learning, you would find that with someone like myself who was staying in a what do you call it? Like a. It's not a complex, but you know, apartments and whatnot. With neighbours at that time they are like wilding out, they having a good time and that time it's like 8:00 o'clock you are in a lecture and they making noise. So there's that element of, you know, like the whole setup that is not as schooling environment, it's more of your residential environment. So people are just going about their day-to-day lives and you on the other hand, you need to focus on your studies, but you can't cause your neighbours are like loud or whatever. It would be some of those. And then also if you like, love and like your Township, so um those days in Mamelodi. So sometimes you'd be there and then for whatever reason, at that time when you are there visiting, then it's time to actually tap into the classroom mode and you are in a lecture and then the

neighbour is also doing the same thing because they own a tavern and so there's those social elements that come into and then the other thing is it's not more social, it's more actually personal." - Stu010F

Finally, unlike the students that referenced noisy environments as a negative influence, two other students indicated that their home environments were favourable for e-learning:

"And I I we Even so and at home it would have like a a backroom, right. So I was even able to go there and sort of set up a workstation there in a very and kind of make that into like a workspace, you know."- Stu01M

Further:

Umm fortunately for me, I live with my two older brothers and you're just the three of us. Then the environment, like the whole atmosphere was, it was always like a like a a work centric atmosphere. So when I was at home, there's not like it wasn't like playful. Like I did recognize that, yeah, these people, they have people like they work as well. So then it's kind of like put me in that same mindset and that same environment. "It was almost like an office environment because I remember we had a like we even had, like a desk setup and all that. So then yeah, I think in terms of like the physical environment is um fortunate for me, know something that we did help a lot because we also didn't have too many disturbances. It was a good a good neighbourhood." - Stu06M

5.4.3.3 ICT Infrastructure

50% of participants alluded to ICT infrastructure being another factor influencing their ability to use e-learning effectively. Of these participants, two referenced the ICT infrastructure from a positive perspective, while three described the frustrations experienced as a result of the inadequate infrastructure.

Some of the positive experiences are outlined below:

"I think for me I was in a very privileged position where I had access to, you know, good Wi-Fi that and that really helped me, you know, download the videos, watch the videos, cause a lot of these videos were quite big in size. Like, you know, like you go and think it's like a 2 gig video that you have to download, you know, and like, obviously that's not that doesn't take like 2 megabytes." - Stu01M

Interestingly, one student exclaimed how impressed they were with the infrastructure in Pretoria, whereby the government provided free Wi-Fi:

"Yeah. OK. So for the most part of my studies, I was still in Pretoria. So sometimes um I would be by my mother's mother in laws place and the one good thing with the infrastructure in Pretoria is that there's that free Wi-Fi, so that assisted a lot in terms of I didn't have to really spend much when I was there because I could connect via that free Wi-Fi and luckily well, her place is like near the pole. So the connection is a bit stronger than if you are not close to that pole. So that in terms of the infrastructure that is provided by our yeah, government it played an immense role. So we big ups to them! And so yeah, that is the one that I can think of." - Stu010F

Conversely, some described challenges with inadequate infrastructure, specifically network quality:

"So we couldn't.. we don't have an internet café near, we don't have any other place… or library in this area. So if you can't access your internet in your Res then there is no way you can access e-learning. So but this year is different, the network quality is different where I stay at, so only disadvantage is when I don't have data or Wi-Fi" - Stu03F

Further:

"Well, for the first few months of e-learning, I was at home, so it being in Madibeng, which is a pretty bad municipality according to most numbers the connectivity tends to be an issue with most networks, so having to write test online or the struggle because submission comes submission time, there would normally be some sort of issue. I remember having to email so many…Well, having to go outside, I literally had to go next to a tree just to be able to submit some of their assignments. And I have a friend who could not submit most of assignments, most of her tests as well and exams, so she normally had to send her answers through to people so that they can upload for her because of how bad the network where she lived was." - Stu05M

5.4.3.4 Organisational Support

Another environmental factor described by two students was the organisational support provided by HEIs. One student described it from a negative perspective, citing the lack of support:

"So even with learning like what other when other universities was sort of preparing themselves for this online learning and also giving students time, Stellenbosch University just wanted to start like immediately you know they want to.. they were just more focused on not losing teaching time and not losing time and what happened is that there were a lot of students who were sort of left behind you know a lot of students who didn't have access to these laptops that the university promised a lot of schools; didn't have access to bundles at the university promised, you know, and I think the one factor that influenced… we had this thing where we don't we don't wanna leave this. There was this movement that we had where no one is being left behind you know so." - Stu01M

Another student referenced it from a positive perspective, whereby the HEI provided data to students:

"Another thing terms of the environment and as much as uh. The first months I was at home, the university provided data for people, so I think that really helped." - Stu05M

5.4.3.5 Weather

One student mentioned how the weather was another environmental factor which affected the Wi-Fi connection.

5.4.4 Technological Conversion Factors

This section presents findings on the technological factors which influence the effective use of e-learning, which is the fourth and final aspect of understanding the comprehensive conversion factors. These factors consist of course content, e-learning course administration; course design; usability; system quality; system design; technical support; and experience with e-learning systems.



Figure 11: *Technological Conversion Factors Influencing the Effective use of E-learning*

5.4.4.1 Course Content

25% of respondents indicated that the course content and the accessibility of the lecture recordings made available on the respective e-learning system were factors that influenced their ability to use e-learning effectively.

One participant explained how helpful it was to watch the recordings without having to download them when accessing them via the designated e-learning system:

"You know, you could watch these lecture videos through Sunlearn without necessarily having to download them, you know? So I think that's one factor that really helped us like in this, you know, because sometimes I remember they tried this whole thing where we couldn't download the lecture videos and then watch them." - Stu01M

Another student outlined the convenience of being able to save the videos to watch them at a later stage:

"OK. Yeah. That you could save videos. You could watch them later. You go back to a section at a later time." - Stu07M

Conversely, unlike the two participants who depicted this factor from a positive perspective, another student described the issue of not being able to toggle through the speed and points of the videos and further cited how they felt a correction thereof would have made things easier:

"The issue came with the recording, so some of the recordings could not download offline. Some of the recordings. Well, I don't recall being able to fast forward or increase the speed of recordings, so I think that would have made life a lot easier since some more of the lecturers speak too slowly and one would like to be able to speed up and one would like to be able to move to certain parts. So if you're rewatching a lecture, if you have it downloaded or you have that option of toggling around since you might have missed something during class around a certain point, I think that would have been more useful." - Stu05M

5.4.4.2 E-learning Course Administration

The findings also revealed issues around the e-learning course administration, specifically from the side of the lecturers. One participant outlined that the e-learning tool is only as good as the person using it, so whichever shortcomings they had, will be mirrored through the system:

"Bad in terms of the fact that, it kind of it's just a platform, if that makes sense. So if somebody's bad at communicating, then ClickUp doesn't really help. So it's the mere fact that ClickUp is just the platform. It has no job in, you know, lecturing us, in communicating with us in. It's kind of the person on the other ends issue, you know, on both ends." - Stu09F

Additionally, another student outlined the frustration and difficulty brought about by the inconsistencies between the different lecturers' delivery styles:

"And the other point is that even though we had these systems that were for us to be able to be taught and to receive material, there were some lecturers who still prefer to not to go that route. So it would be difficult to know that, OK, where do I now look for information from this specific lecturer? It's like there were not consistent with the way that in general the department worked, they all had owned different styles of teaching. They would all have their different styles of in terms of how they give us the learning material so that as well it just it's a bit problematic if I can call it that because

now you just.. there's no consistency. So you need to remember that OK, if it's this lecturer, I'm going to get stuff via the class captain, if it's this specific lecturer, they will send it via e-mail, if it's this one, they will send a group chat on WhatsApp. So that was very confusing. I would rather have one environment."- Stu09F

5.4.4.3 Course Design

41.7% of participants outlined how the course design was another factor which in all cases positively influenced their ability to use e-learning effectively as it was easy to navigate to respective content and material without much of a hassle. See the responses explained below:

"okay so basically, number one: it's easy to access, its straightforward. As soon as you log onto to Brightspace, you just get your modules. They'll be like "if you want to access financial accounting, you can do that.. if you want to access auditing".. so that's where you find information for each module, it's under its own category so it's not complicated." - Stu09F

Further:

"Uhm also with.. and also with the student email, where if they are like.. they send you.. if you don't want to access your things via Brightspace you can just go into your student email, under your student email that's where you get "this is the recording for the lecture on this specific date" so if you remember that on the 27 of April we did this, you can go to your student email and search the date.." - Stu09F

"With me, Microsoft teams is the easier. I think last year we tried Zoom so I feel like Zoom was more complicated and had a lot of disadvantages but with Microsoft teams its better because you can also access the files that were being shared during the class, you can access the recording, you can everything even the messages that we were asking the lecturer. Yah, it's easier so Microsoft teams is more effective, its better.." - Stu03F

5.4.4.4 Usability

The findings also demonstrated how the usability of the e-learning system also played a role in the e-learning effectiveness of some students (50%). One student explained the ease of use below:

"Another thing navigating Blackboard itself was.. it was somewhat intuitive, but at times having to go back to pages just it, it is not the most user-friendly system so depending on how stressed you are at the time of frustrated, you are having to navigate like Blackboard as well it it it would just make a person more more anxious or more frustrated, depending on how they're feeling but I think it was generally an OK system." - Stu05M

Further:

"So like the layout or the user interface was very simple." - Stu07M

Further:

"Because besides like, it was also easy to use. You know, it wasn't too complicated that you needed to go on a course or anything. And also it was available when I had data so I could do everything because of those tools like I could really complete my.. like I could do everything and then to do so. Yeah, I think I know I'm happy with." - Stu08F

Another interesting insight which came from two participants focused on the standardised design of the system or how prior experience with similar tools subsequently influenced their experience in the context of e-learning, positively:

"So I think Blackboard overall was an OK system I think because that the time I had a bit of exposure to Google meet and teams so it's… and the bit of zoom. So in terms of online lectures, it was more or less the same, the same experience." - Stu05M

Further:

"So that I was fine with and more because I was really exposed to teams. So I had background or that knowledge on how to use that specific system. It made things a bit easier for me to work, or rather to receive my education via teams." – Stu10F

5.4.4.5 System Quality

Two participants, surprisingly from the same university, outlined the technical challenges they experienced with the system as a factor which influenced e-learning negatively. These challenges encompassed the uploading and downloading performance and subsequent system glitches.

One participant outlined these issues and also further attributed it to the capacity which increased as a result of moving from hybrid to 100% as a result of the pandemic:

"So there was, there was that and then there was the fact that..Yo yeah! ClickUp has a lot of issues, you must remember, we kind of went from hybrid, that was like 20% online.. not even 20%, like maybe 5% online at 95% in contact. So it wasn't really used at the scale, it was used before and even when they tested it, they didn't test it for pandemic issues. They tested it for very light use, and I have reason to believe so because the moment the pandemic hits, ClickUp was struggling to keep up with a lot of the um the amount of students online, not just the amount of students online. When you have to submit, you know, everyone would kind of submit more towards submission time, it would then it would lag because the system was not built to carry that." – Stu10F

5.4.4.6 System Design

Two participants described how the system design influenced their ability to use e-learning effectively. One of the participants indicated that although Microsoft Teams was admissible in aiding with the basic transition from the classroom to e-learning, they still believed that it was not effective as a learning collaboration platform but was rather more of a presentation platform. This student further described how it would be more effective if a platform that was a replica of the face-to-face classroom environment was implemented instead, one which would facilitate more

interaction, social presence and engagement. Conversely, another participant indicated that the same tool was sufficient in creating a classroom environment and further highlighted the breakout rooms feature available on the tool:

"… and being able to be like in a classroom environment and then also be, you know like when you are in a classroom and then they say we grouping you in groups of two and then you'd create sort of like a another room on the side." - Stu010F

5.4.4.7 Technical Support

Other technological factors, those linked to the e-learning system itself, were help and support; transitioning to a new e-learning system; and training. These were raised by a maximum of one student each and are outlined below:

One participant described how it was possible to connect with the lecturer as the contact details were made available on the e-learning system:

"hmmm, what else…? Oh and yah it's easy to use and if you have a question, you don't have to struggle with asking the class rep for the lecturer's email or something, it's written at the bottom of each Module.. that's like yah.. so you can just contact them." – Stu02F

Another student outlined how there were short tutorials on how to use the e-learning which although helpful, the student felt that the duration could be increased to enhance the contribution these videos made:

"When you log in for the first time, you had a small tutorial that showed you the basics: So how to switch on camera; how to answer questions; how to participate in those pop up quickly and how to chat with a student directly were things that we learned as time passed, they weren't there in that short tutorial. But we saw that you know, if you wanted to say something to classmates, you could click on certain tabs so yeah, it was a great platform which just needed maybe instead of a 30-second tutorial, maybe like a two-minute or a 5-minute tutorial that could have made it amazing." - Stu07M

5.4.4.8 Experience with e-learning system

Finally, another student explained the complexities in transitioning not just between HEIs but also e-learning systems:

"However, with eWits that was a bit different for me because I was coming from a different institution altogether, so being introduced to another environmental, another online learning system that was a bit, you know, tricky, just being able to navigate around it. And the reason for that is that I don't like reading like long instructions on how to use stuff, so I'm more of a uh, "just search for it, you will find. Just click on every navigation icon you'll eventually get what you're looking for" but going that route is a bit more tricky because it was a different system to what I was used to. And then the other thing is I hadn't mentioned it, they did like midyear change to another system which was called uLwazi, so

now you know this one system that you were trying to get used to, now you're on another environment and now you need to learn that new environment." - Stu02F

5.5 FACTORS HINDERING AND ENABLING THE EFFECTIVE USE OF E-LEARNING

This section presents the thematic findings that led to the identification of the factors hindering and enabling the effective use of e-learning by South African HE students for academic continuity during the COVID-19 pandemic. Thus, to answer RQ3: *How is the effective use of e-learning by South African HE students hindered and enabled?*

5.5.1 What are the factors you believe hinder the effective use of e-learning?

The first aspect in describing the factors hindering and enabling the effective use of e-learning is in depicting those factors that hinder the effective use. The thematic findings are presented in this section and categorised according to the classifications identified in the literature review section, which consist of infrastructural; institutional; individual; and societal challenges which hinder the effective use of e-learning by South African HE students.

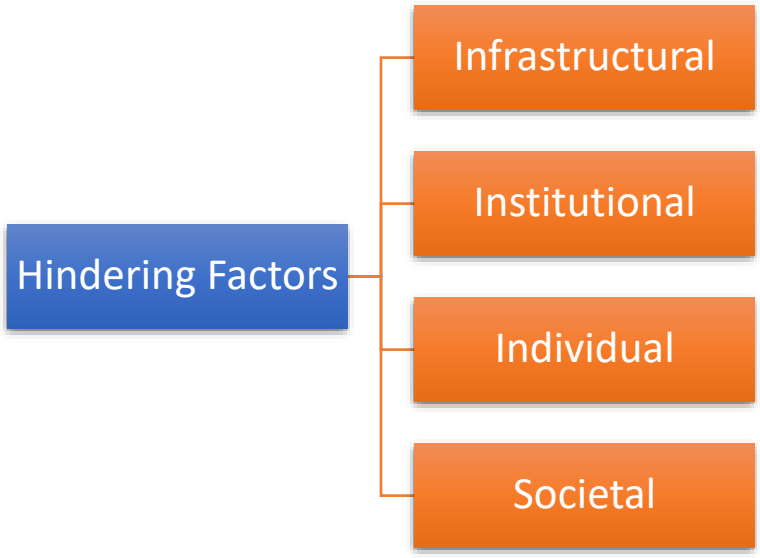


Figure 12: *Categories of Factors Hindering the Effective use of E-learning*

5.5.1.1 Infrastructural Hindering Factors

The themes identified under the infrastructural hindering factors category are internet connectivity and bandwidth issues; electronic devices issues; electricity outages; and an unconducive home environment depicted in Figure 13 below.

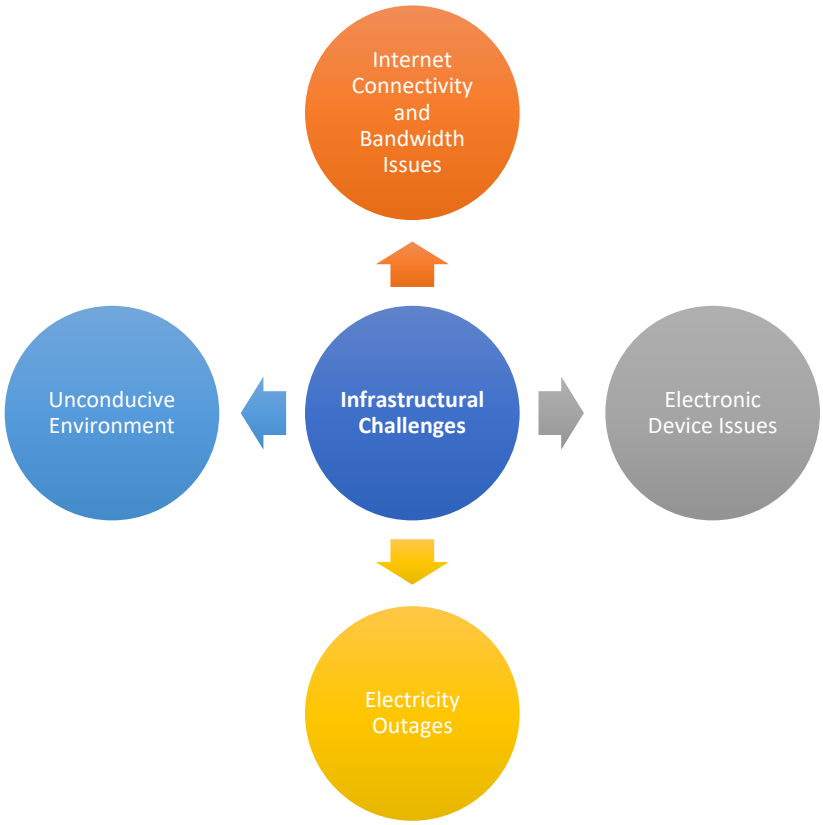


***Figure 13**: Infrastructural Challenges Hindering the Effective Use of E-learning*

5.5.1.1.1 Internet Connectivity and Bandwidth Issues

Internet connectivity-related issues were described as the top category of factors hindering the effective use of e-learning by the majority of respondents (66.7%). See responses from some participants below:

"obviously with connectivity, the connectivity is the lecturers or on your side. You either won't be able to attend or it will just disrupt the flow." - Stu05M

Further:

"And then with the whole connectivity, if for instance, there was.. like let's say your service provider for that day for some reason something was off on their environment, then you would have to keep logging back in and out and then

you are dropping off, that time you are the one who's presenting an aspect of whatever that you needed to present on that day for the class. So that again I see it as a hindrance of some sorts." - Stu010F

Some participants mentioned that their HEIs provided students with data, however, the amount thereof was capped as outlined by respondents below:

"The amount like, I think that's one thing that amount of data that umm, the university gave us. I think for me personally that was I think the only factor that was like sort of hindering me" - Stu01M

Further:

"And then also issue of Wi-Fi.. I know they gave us data but then Umm, it's finite, it finishes and yeah, it it doesn't give you the peace of mind really cause your always have that thought that the back of your head like, OK, "my data is about to finish, so I can get this done" and your always.. like on your toes really. When you think about it. Even when it come it comes to test, we have online tests and all that." - Stu06M

Furthermore, it was further revealed that geographical location played a role in the network quality of the internet connection, as explained by the three participants below:

"And then the other one is.. it wasn't really an issue then, but it could be an issue now cause a relocated and the area that I now stay in is a bit more backwards. So if you didn't have fibre, then you have to rely on your Internet service provider." - Stu010F

Further:

"okay I did mention the network problem, because also the area we are in is just really.. so sometimes you just like "ag nah, I'm not about to" because you.." - Stu02F

Further:

"So the Wi-Fi never changes. On campus the Wi-Fi is generally good but when, once you start moving to the residences the Wi-Fi is not good, it's quite disappointing."- Stu05M

5.5.1.1.2 Electronic Device Issues

Issues related to electronic devices were identified as the second highest category of factors that hinder the effective use of e-learning as revealed by 50% of participants; this finding encompassed either the lack thereof or a deficiency in the quality of the devices. See responses form some participants below:

"Not having proper resources like not having a laptop.. if you don't those then you won't attend unless you borrow from someone"- Stu03F

Further:

".. I have a laptop, I'm fortunate enough of that, but then another student does not have that does not have that Umm, that blessing or whatever, I don't know what word to use.." - Stu06M

The findings also revealed that not only was it about having a device but also the quality thereof was a critical aspect which could hinder the e-learning experience as explained by some participants below:

"I think one thing I forgot to mention was the quality of devices. So people who are really had like laptops, they were not…uh, they excluded from the laptops that were provided by the university or that were loaned by the university, those were good quality laptops, so students who had poor quality laptops I know many people's laptops, they're going to just shutting down if they're not plugged or they slow. So that takes away from the experience. And if you have an online test in your laptop, just switches off, becomes an issue during the lecture, if it switches off those kinds of things they.. they do affect a person" - Stu05M

Further:

"I think the.. the old hardware and that kind of stuff really does. I know quite a few people that trouble with that and they didn't realize it until, you know, you had to do e-learning and you realize your laptop is slow, you can't type certain things up. You can't, you know.. even though you have the good Internet connection, good social environment, you know, etc, etc but if your hardware is not good you kind of get thrown into the curb." Stu09F

5.5.1.1.3 <u>Electricity Outages</u>

Power outages or load-shedding was identified as another factor hindering the effective use of e-learning, with 41.7% of participants citing frustrations and disruptions as a result thereof. This is explained below:

"And also the issue of load-shedding, so imagine you are busy writing your exam then next thing you know, all your things, all your progress is wiped out." **-** Stu06M

One participant further highlighted how it was not possible to coordinate class times around the load-shedding schedule since every area had its own schedule, which meant that students would experience load-shedding at different times:

"Yoh okay, one of the things that made it difficult, I would say that it's this whole situation in the country with regards to the power. So you would for instance working an 8 to five job and then all of a sudden you are being load shaded at 4:00 o'clock. So now you need to continue utilizing whatever PC that you have for the next hour to complete your task for work. And then in an hour's time or 30 minutes time, then your lecture starts and then now then all of a sudden your battery is low, it switches off. Now you can't even attend the session that was being held. Or the other thing is because we all live in remote areas, or rather different areas, even we couldn't even plan to say that: "Guys, let's have have our class or the lecture at a certain time" because load shedding affects us in different time slots. So that makes it a hell

yoh like difficult to even trying to get to a point where we are all aligned in terms of when can we actually have our sessions. So that is the biggest what can I call i hindrance if I can call it, yeah." Stu010F

One student went further to link the effects of load-shedding on the Wi-Fi connectivity, as depicted in the response below:

"They are generators on campus. Since we are online, there were generators Res, the issue with the generators was that the WI-FI would not be as good so it would be difficult to connect." **-** Stu06M

5.5.1.1.4 Unconducive Environment

25% of participants agreed that an unconducive environment was another factor which hindered their effective e-learning; their homes were unfavourable for learning.

5.5.1.2 Institutional Hindering Factors

The themes identified under the institutional challenges category are the attitude and tone of lecturers, and limited system training depicted in Figure 14 below.



Figure 14: *Institutional Challenges Hindering the Effective Use of E-learning*

5.5.1.2.1 Attitude and Tone of Lecturers

The attitudes and tone of lecturers were also identified as a factor hindering the effective use of e-learning by three participants. One student stated that some lecturers lacked empathy and understanding and felt like the concerns of students were not being heard and supported when they would complain, while the other responses were as follows:

"okay so uhm sometimes the lectures contribute to the.. the lecturers, most of them are impatient, it's that thing.. sometimes you want to ask a question, but they'll be like "ah no I already explained this, what don't you understand!" and it now like you forced to just be like "okay fine, I understand" without understanding properly because of their impatience and everything" - Stu02F

Furthermore, one participant made a specific reference to the tone of lecturers as a factor:

"The second thing would be people who are monotone, well that's the same for in-person classes, but then when you're online and someone speaks in this slow tone and this...It becomes really difficult for one to concentrate and pay attention because if any, in an in-person class, you know that should you fall asleep, people will be watching then if you're online, if you fall asleep, you know that nothing will happen. So you lose that conservation to stay and actually listen to what the people are saying." - Stu05M

5.5.1.2.2 Limited System Training

Limited training provided on how to use the e-learning system was also identified as a factor hindering the effective use of e-learning, expressed by 25% of participants. One participant explained it from the perspective of both the lecturers and students:

"Um the only thing that also made like.. some educators you know.. they don't like, OK. I don't know like how to say this, like they didn't know how to use the tools that were present... They didn't use it to the best of its ability. The students too, we didn't use it to best of its ability.. We didn't use it to the best of our ability. Many features were discovered towards the end of the semester, that's when you realize that we could do 1234567, you know, so I think that was also a hindrance because, wow, we just logged in and did nothing, basically just attend and just show up. So the features as a whole for the Blackboard platform were not utilized to the best of its ability. In the beginning, but as time passed as one teacher would discover she or he would share with others, and things got better. So yeah, I think if they had time to train, things would have went smoother." - Stu07M

Two other participants outlined it specifically from the lecturers' perspective. See the response from one participant below:

"Lecturers who are unfamiliar with the system or the technology, so It makes it quite difficult if people are unable to use the microphones, for example, who were unable to conduct meetings. You know, so some people can explain, can draw; they can do a lot of things on the Blackboard platform but if you don't know the functionalities and if you don't understand them, it makes it. It makes it more, less. It makes it more difficult for you to properly

Uh, explain your concepts because when you're in a physical classroom, you can draw on the board, whereas if you're online and you don't understand how to do that, it takes away from the experience. I think that would be the first thing."
- Stu05M

5.5.1.3 Individual Hindering Factors

The only theme identified under the individual challenges category was procrastination in Figure 15 below.

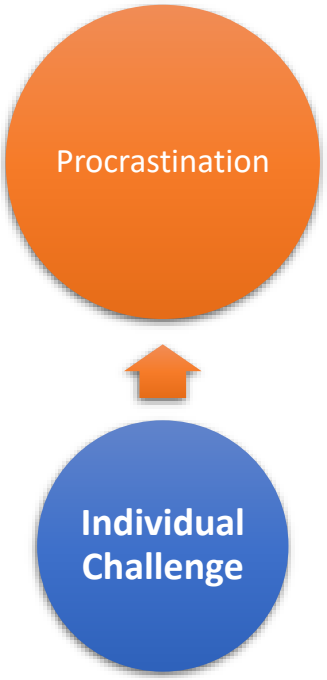


Figure 15: *Individual Challenges Hindering the Effective Use of E-learning*

5.5.1.3.1 Procrastination

Interestingly, two participants described how procrastination was also a factor hindering their effective use of e-learning as depicted below:

"uhhhhm and also and also the fact that sometimes I do really procrastinate. I just be like "okay no I'll just watch the recordings later" and then now they all packed up and then I have to work under pressure then now it's like okay, can't get everything so just have to do umm 50% of the work, work on 50%. It affects our ability to do good" - Stu02F

Further:

"you find some people procrastination is a big thing. Then you have all these like all these course content just dumped at you and then you just like, "OK, I can manage this, let me just.. let me just chill for a bit, like the test is a bit far away. Let me just chill for a bit. Let me just yeah let me just lay back" and then next thing you realize the test is like tomorrow and you have all this work that needs to be done but then since you didn't have that structure that like put you in a place where you had to do all that stuff it really does um you find yourself in a situation where you're behind and I think that's something a lot of people can relate to um yeah." - Stu06M

5.5.1.4 Societal Hinder Factors

The themes identified under the societal challenges category are lack of access to resources and corruption depicted in Figure 16 below.



Figure 16: *Societal Challenges Hindering the Effective Use of E-learning*

5.5.1.4.1 Lack of Access to Resources

Four participants cited the unavailability of resources as another factor hindering e-learning. While two of the four referenced it in a broad sense, the other two specified that it was more from a financial perspective:

"One thing that like really relevant to like us as Africans is that not everyone has access to the same resources." - Stu06M

5.5.1.4.2 Corruption

Another hindering factor identified by one participant was the corruption of government funds that were released to assist HEIs and students with the transition to e-learning.

5.5.2 What are the factors you believe enable the effective use of e-learning?

The second and final aspect in describing the factors hindering and enabling the effective use of e-learning is in depicting those factors that enable effective use. The thematic findings are presented in this section and categorised according to the classifications identified in the literature review section, which consist of infrastructural; institutional; individual; and societal factors which enable the effective use of e-learning by South African HE students.

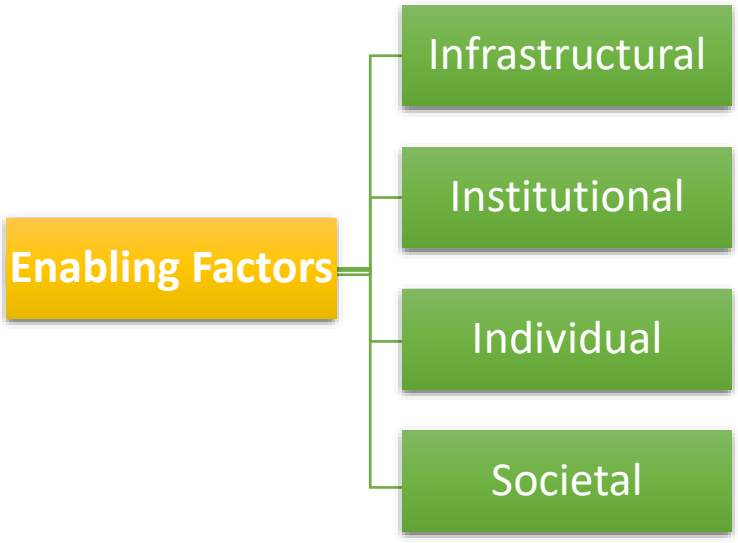


***Figure 17**: Categories of Factors Enabling the Effective use of e-learning*

5.5.2.1 Infrastructural Enabling Factors

The themes identified under the infrastructural enabling factors category are internet connectivity; a conducive home environment; electronic devices; and system quality depicted in Figure 18 below.

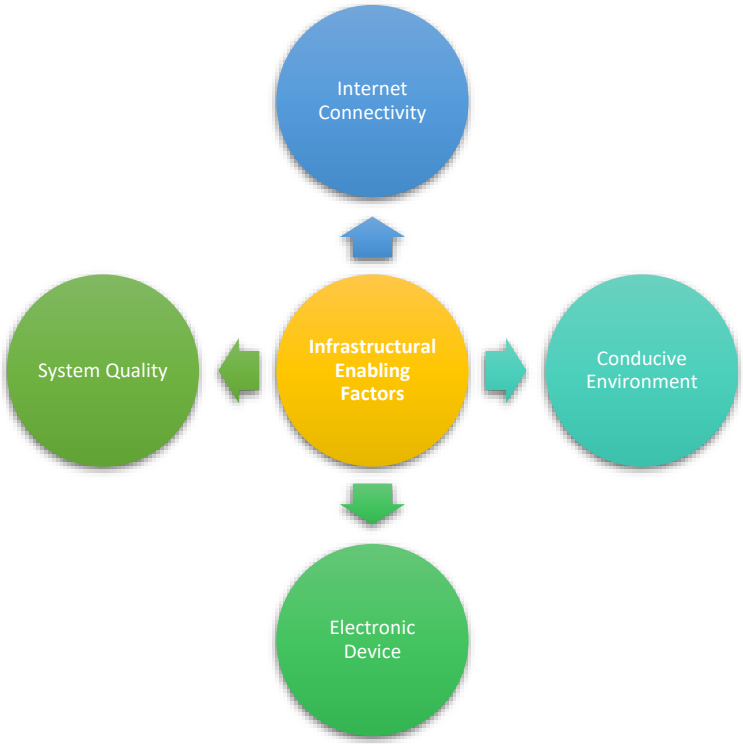


Figure 18: *Infrastructural Factors Enabling the Effective Use of E-learning*

5.5.2.1.1 Internet Connectivity

The findings revealed that internet connection, either through the delivery of data or Wi-Fi was the top factor which the majority (58.3%) of participants believed enabled the effective use of e-learning. See the response below:

"So would it be having my internet because without that internet, I wouldn't be able to access the material that was provided to me in order for me to complete any tasks." - Stu010F

Another student further highlighted the strength of the internet connectivity:

"The first thing would be stronger internet connectivity, so living in South Africa Internet connectivity is generally it's bad. So even when I was in Res, I was in Hatfield. I'd have trouble connecting to the internet so that would disrupt the flow." - Stu05M

Moreover, two participants described how geographical location affected their internet connections, see the responses outlined below:

"The only is internet access. Oh internet access, it's the biggest factor, in my opinion. It was the difference between passing and failing. Because no network, no class, no test, no nothing. And the problem is that for us, they gave us Telkom SIM cards, which worked fine at my mother's house but didn't work at all at my grandma's house, so that was a problem." - Stu07M

Further:

"Umm I think obviously the one by default is internet connection, because I know a lot of students struggled with that. Umm, you don't realize how.. how bad the internet connection in your area is, until you write an exam or a test with it." - Stu09F

5.5.2.1.2 <u>Conducive Environment</u>

A conducive learning environment was also identified as a top factor that enabled the effective use of e-learning and was referenced by five out of the 12 participants:

"… a space where you can actually work" - Stu01M

One participant attributed the environment to the number of people sharing the home:

"Location and mainly how.. and truth be told, it also depends on how many you are at home, because if we are many, you cannot really study.." - Stu07M

Interestingly, one student highlighted the contrast between the classroom environment and the home environment, exclaiming that they preferred the latter due to it being less noisy:

"And then the other one is actually peace and quiet, without it's just so difficult to focus. So I think even going this whole route of being a remote in terms of studying it provides you with a bit more peace, there is a less noise umm, especially the classroom noise. Like sometimes I get annoyed when I see too many people around you and then concentrating becomes very hard."- Stu010F

Further:

I think your environment as well, being taken out of that traditional like hall with the thousand learners and all that. For some people, it could work to their advantage as well, and just putting yourself in the place where you're most comfortable as well, it's something that works to the favour of the student and help them get to where they want to reach." - Stu06M

5.5.2.1.3 ***Electronic Device***

A few participants (33.3%) identified having an electronic device, more specifically, a laptop as a key factor in enabling effective e-learning. One student explained:

"And it would also be the hardware that I needed so my.. without that laptop then I wouldn't have been able to complete all my tasks" - Stu010F

5.5.2.1.4 ***System Quality***

Another was the effectiveness of the e-learning system itself, whereby one student outlined it as follows:

"What you also need is.. I think an effective system actually put in place not just effective, efficient and efficient system put in place because there were a lot of times when um you know, the system would kind of glitch and there were marks that were incorrect, things missing. You know, something would go up for a certain amount of time and then come off. So such glitches in the system can really be detrimental to, you know, a student."- Stu09F

5.5.2.2 Institutional Enabling Factors

The themes identified under the institutional enabling factors category are support from HEI; and course content depicted in Figure 19 below.



Figure 19*: Institutional Factors Enabling the Effective Use of E-learning*

5.5.2.2.1 Support from HEI

The assistance or support from HEIs in some form or another was identified as the second top category which students believed enabled the effective use of e-learning (41.7%). The findings revealed that not only was support required from the lecturers but in some cases from the tutors as well:

"I think for me it's support, student support... Just if a university has someone that just solely looks or focuses on the experiences of students on learning, so every now and then, you know there's those.. maybe feedback sessions or an email or.. because I would probably be having say challenges, I am learning, but it's not effective but who do I tell? Who do I share my experiences with that they'll take them in, then see what they can do to maybe better my experience, make it effective.. So I'd say it's supports from the inside like the universities"- Stu08F

Further, one student highlighted the importance of communication between lecturers and students:

"So what I believe is that you need effective communication between students and lecturers and simply for the fact that with the transition to e-learning, there's just.. there are a lot of gaps that lectures may not see that students will see, and you need that sense of communication and openness as well between the two parties, in order to make everything work umm that can be beneficial to both sides" - Stu09F

Further:

"Another thing that was effective was allowing more time for lectures. So the lecture is.. so the lectures I noticed were slightly longer. So because of that it would just give people more time to be able to ask questions and some people, some people are shy, so when they're in person, it's difficult for them to ask questions, whereas when they're online, they're have that sense of anonymity to some extent. So they will ask and having more time just allows those people that are more shy, more reserved to actually build up that confidence to ask those questions. So I think those are some of the factors that have been effective." -Stu05M

Further:

"hmmm okay also more like tutors, cause it's only the lecturers and sometimes you know you not really comfortable with asking them questions so at least if you have a tutor then it's like okay guys do you understand.." - Stu02F

Finally, one participant emphasised the importance of both students and lecturers receiving the necessary IT support as an enabling factor for the effective use of e-learning.

5.5.2.2.2 ***Course Content***

Learning material, both hardcopy and electronic was also identified as an enabling factor, with two participants referring to textbooks, pens and notepads; while another mentioned lecture recordings:

"The second factor would be the recordings so in as much as live lectures, are important. I believe that having the recordings available, it allows a person to be able to go back and listen to the recordings again, so if something's unclear, just listening to it to a second time, would actually help a person makes sense of things of which we did not have prior to Uh COVID-19. So I think that was, it helped." - Stu05M

5.5.2.3 *Individual Enabling Factors*

The themes identified under the individual enabling factors are student autonomy and motivation depicted in Figure 20 below.



Figure 20: *Individual Factors Enabling the Effective Use of E-learning*

5.5.2.3.1 ***Student Autonomy***

Two participants cited the autonomy or flexibility of e-learning as a factor that enabled effective e-learning use:

"Limits it's the time it takes to go to campus. You can't be late on e-learning" - Stu04F

Further, one student outlined how it was possible to customise the learning experience according to individual student preferences:

"I'm what factors… um I think the ability for you to work at your own at your own pace and at your own time cause I think students, we would differ. Some people might want some people morning people, some people choose to work overnight and stuff like that. So I think having that choice and having the ability to do all that, it really did help and you could like find something that works best for you and like you said, academics, something that enables you to reach that academic goal you want to reach. So I think that freedom and that flexibility, that's something that really works for e-learning." - Stu06M

Further:

"So all in all, it's just it gives a student the ability to control, to control how they learn, where they learn all that and gives them that ability to tailor their learning experience to how they want to like to, to how they want to reach their goals and all that." - Stu06M

5.5.2.3.2 Motivation

Student motivation, specifically to pass, was another enabling factor depicted by one student:

"I think most of all its determination. If you are not determined to actually pass then and all that, you won't make it because no one is going to run after you to attend classes and the lecturer doesn't even know if you attended or not. So if you chose not to attend, it's a disadvantage on your side causing you to fail and miss out on information."- Stu03F

5.5.2.4 Societal Enabling Factors

The only theme identified under the societal enabling factors category is financial means depicted in Figure 21 below.

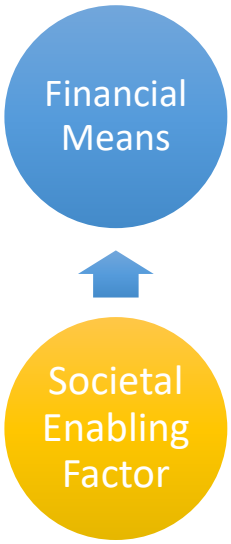


Figure 21: *Societal Factors Enabling the Effective Use of E-learning*

5.5.2.4.1 Financial Means

Financial means were also identified as an e-learning enabling factor by two participants, with one explaining as follows:

"It's a bit far offish, but it's still relevant, it's also the financial means, because without those financial means, I mean I wouldn't be able to afford the laptop that I needed to do this. And I also wouldn't have afforded to pay for the fees itself themselves. So even with the traveling in the beginning, when we did go to campus, having that money to go to, to, to school, to study. So finance also played a role" - Stu010F

5.6 SUMMARY OF FINDINGS

This section depicted the findings of this study which were derived from qualitative data collected using semi-structured interviews and analysed through the application of thematic analysis. The first section (5.2) outlined participant background information which revealed that participants fell within age ranges 21-25 (66.7%), followed by 30-35 (25%) and lastly, 18-20 (8.3%); 75% were enrolled in full-time undergraduate programmes and 25% were enrolled in a part-time postgraduate programme. These participants were from six different HEIs, namely, the Tshwane University of Technology, the University of Pretoria, Rosebank College University of Witwatersrand, the University of Johannesburg, and Stellenbosch University. Finally, participants (100%) agreed that their primary mode of learning before the COVID-19 pandemic was face-to-face or contact learning which is significantly important as one of the key selection criteria of this study.

The second section of findings (5.3) was based on understanding the aspects of how South African HE students use the resource, e-learning. 50% of participants indicated that they used more than one system or tool for e-learning at their respective HEIs; while the other 50% used one centralised system for all their learning functions. Laptops, phones, internet connection, exam pads, textbooks, iPad, electricity, browser, and mobile applications were identified as the resources required for accessing e-learning. From a scheduling perspective, it was noted that most participants (75%) followed the timetable that was provided by their HEIs while 25% followed their own personalised routine. The types of content or information delivered through e-learning were live lectures, lecture recordings, course material such as slides, past papers, study guides, links, notes, worksheets, extra videos, preparatory material, articles, discussion boards, links to YouTube videos, sites, and any other material lecturers felt was necessary for learning such as tutorials, tests, and assignments. Finally, it was depicted that the majority of participants accessed e-learning from their homes while some accessed it from their HEI residences.

The third section (5.4) depicted findings on how personal, social, environmental, and technological factors influenced the effective use of e-learning. Concentration span; procrastination; autonomy or behavioural control; mental health; motivation; and physical health were the personal conversion factors detailed. For social conversion factors, home versus learning responsibilities; social presence and interaction; student politics; peer support; corruption; and economic status were detailed. Electricity; learning environment; ICT infrastructure; organisational support; and weather were the environmental conversion factors presented. Finally, for technological factors, the influence of course content; e-learning course administration; course design; usability; system quality; system design; technical support; and experience with e-learning systems were depicted.

The last section (5.5) depicted findings on how the effective use of e-learning is hindered and enabled; and was categorised according to classifications identified in the literature: infrastructural; institutional; individual; and societal factors. The themes identified under the infrastructural hindering factors category are internet connectivity and bandwidth issues; electronic devices issues; electricity outages; and an unconducive home environment. Attitude and tone of lecturers; and limited system training were identified as institutional hindering factors. Procrastination was the only individual hindering factor identified. Finally, the lack of access to resources and corruption were findings depicted as societal hindering factors. While, from an enabling factors perspective, internet connectivity; a conducive home environment; electronic devices; and system quality were depicted under infrastructural enabling factors findings. The

themes identified under the institutional enabling factors category were the support from HEI and course content. Student autonomy and motivation were depicted as themes identified under the individual enabling findings. Finally, the only theme identified under the societal enabling factors category was financial means.

CHAPTER 6

6 DISCUSSION OF FINDINGS

This section presents detailed discussions on three objectives of this study and will describe: the use of e-learning by South African HE students; how personal, social, environmental and technological conversion factors influence effective e-learning for academic continuity in a developing country's context; and the factors hindering and enabling the effective use of e-learning by South African HE students. Finally, the digital capability framework for academic continuity amongst South African higher education students will be depicted.

6.1 PARTICIPANT BACKGROUND

The findings on the participants' background, revealed that 75% of respondents were between the ages of 18 to 25. This insight is particularly noteworthy as the collective age groups of 18-20 and 21-25 fall into the generational category which Turner (2015) refers to as Generation Z or Gen Z, which consists of individuals who are born between the years 1993 and 2005. One of the key characteristics of this generational category is the notion that they have the highest degree of digital literacy as they have not lived in an era without the internet (Turner, 2015). This notion could have an impact on the findings of this study, students could be presumed to be more comfortable with e-learning; however, caution is advised when reviewing this notion as it may not necessarily hold for the South African Generation Z or in the context of this study where e-learning is the only method of learning available.

Consistently, the 75% noted to be in the two youngest categories (18-20 and 21-25) of respondents, were all enrolled in full-time undergraduate programmes. This may also influence the findings of this study as those who are enrolled full-time may be required to have more frequent participation and interaction with their learning through whichever mode, than the 25% who are enrolled on more of a part-time basis. Thus, their experiences with the transition to e-learning could differ as a result thereof. For instance, the findings on resources required for e-learning in section 5.3.2 revealed that a work laptop was utilised for e-learning, something which was not depicted by those that fell in 75% of the youngest categories. Additionally, it was also noted in the findings in section 5.4.2.1 that students that were also parents, had certain home responsibilities towards their children which influenced the effectiveness of their e-learning usage.

The findings also noted that the participants were from six different higher education institutions from three different cities within South Africa. The Tshwane University of Technology, University

of Pretoria, Rosebank College in Pretoria, University of Witwatersrand, University of Johannesburg in Johannesburg, and Stellenbosch University in Stellenbosch. Firstly, this variety in HEIs provides a wider range in understanding and describing e-learning for academic continuity, either due to shared or similar experiences or differences thereof. Another factor that can be considered is the difference between the experiences of students in public HEIs versus those in private HEIs, in this study only one out of the six HEIs was a private HEI, specifically Rosebank College while the others were public. This can be linked to the findings in section 5.4.2.5 which depicted how the corruption of government funds which were allocated to assist in the transition to e-learning was a hindrance to participants, specifically those in public HEIs. This could be attributed to the notion that government assists and subsidises public HEIs, as highlighted in the findings by Tarus et al. (2015). Additionally, the geographical differences of the HEIs may also play a role in the findings of this study as potential environmental or provincial factors may influence their e-learning experience, thus these were monitored closely.

Finally, the findings on the background of participants also revealed that all participants fell within the criteria defined in selecting participants for this study:

- 18 years old and above;
- Enrolled in any South African higher education institution;
- Pursuing either undergraduate or postgraduate studies;
- Used e-learning as the primary mode for education during the non-contract classroom learning, as a manner of ensuring academic continuity due to the pandemic; and
- The modes of e-learning used in this study are those platforms or systems which are accessed by students and instructors, exclusively via the internet.

This was specifically important to consider given the expert and snowballing probability sampling methods were applied in selecting participants. Consequently, it can be concluded that all participants were relevant and in the scope of this study.

6.2 THE USE OF E-LEARNING SYSTEMS BY SOUTH AFRICAN HE STUDENTS

The first objective of this study was to describe the use of e-learning by South African HE students and consequently answer RQ1: *How do South African HE students use e-learning?*

The thematic findings of this study have led to the identification of system types; resources required to access e-learning; the time when e-learning is accessed; the information or content delivered through e-learning; and the location or setting where e-learning is accessed from.

6.2.1 E-learning Systems used at HEIs

The findings revealed a 50% split between those who had one dedicated e-learning system to perform all functions and those that indicated that they used more than one system or tool. An interesting insight was those who specified the use of more than one tool and referenced Microsoft Teams as the video conferencing tool which was used for live lectures and/or tutorial sessions. A possible explanation behind this can be that the pre-existing student portal did not have the live lecture functionality and was used for all other learning functions except for the classroom. This assumption can be supported by three participants who explicitly specified that the e-learning system they switched to for academic continuity, was the same one already in use before the pandemic, the scope of use being the only differentiating factor. This finding also revealed that Blackboard was the most used e-learning system by participants of this study; which is no surprise as it has coverage in several e-learning usage studies in other developing countries: Brazil, Malaysia and Saudi Arabia, which demonstrates that it is a system that can work in different environments (Almaiah & Alyoussef, 2019; Alshehri et al., 2019; Binyamin et al., 2017; Cidral et al., 2018). Furthermore, Blackboard was also referred to as a system used in the context of the COVID-19 pandemic in a study by Al-Mamary (2022) which sought to understand the use of learning management systems by undergraduate university students using the UTAUT model during the COVID-19 pandemic. This further demonstrates that it is a system that can be used in different contexts; which is consistent with the finding of this study which outlined that Blackboard was a system used before the pandemic, the differentiating factor being the scope in which it was previously used, which did not include being the primary platform for actual lectures. This further demonstrates the benefits of implementing an e-learning system that can be used in different contexts to manage possible transitions thereof.

6.2.2 Resources Required to Access E-Learning Systems

This study identifies the category of electronic devices as one of the top resources used for e-learning, which encompasses laptops, cell phones and iPads. Similar devices were identified in a study by Alshammari (2020) which outlined laptops, PCs and phones as devices used to access the LMS system. This demonstrates that e-learning is not and should not be limited to a device type to encourage flexibility; or that which Cidral et al. (2018) cite as collaboration quality, which

consists of cooperative electronic features, culture and the use of such electronic learning platforms on various devices. Collaboration quality was found as a factor influencing e-learning in that particular study (Cidral et al., 2018). This finding can be linked to the findings on the factors which enable the effective use of e-learning in section 5.5.2.1.3, which depicts electronic devices and further highlights the importance of this resource in e-learning. Furthermore, issues linked to electronic devices may result in hindrances to e-learning as reported in the findings presented in section 5.5.1.1.2, which outline the lack thereof or the deficiency of quality among the top hindering factors, thus, demonstrating not only having access to electronic devices but also highlighting the importance of the quality thereof.

Internet connection is another resource this study identified and has been classified through data or Wi-Fi medium. This finding is specifically crucial as it is a significant facet of the type of e-learning used in this study which is consistent with the one provided by Rosenberg (2001) who refers to e-learning as a learning platform accessed by students and instructors, specifically via the internet. Similar to the associations made for the electronic devices resource category, internet connection can be linked to findings on enabling factors as well as hindering factors which identify internet connectivity and bandwidth issues in section 5.5.1.1.1. This subsequently highlights how crucial this internet connection is for e-learning which can possibly explain why the findings also revealed that some HEIs assisted their students by allocating them with data to enable their participation in e-learning.

Electricity is another resource that this study identified which has also been referenced as a factor influencing students' ability to use e-learning effectively as reported under section 5.4.3.1; which depicted how outages had a negative influence. Furthermore, electricity or rather, electricity outages were also reported as a hindrance to the effective use of e-learning as depicted in section 5.5.1.1.3. This finding demonstrates the importance of electricity in an e-learning environment as one of the participants in section 5.4.3.1, expressed how it not only affected the charging of electronic devices but also the internet connectivity.

In addition, the findings also reveal that other resources such as exam pads and textbooks can be used in learning in the contexts of both online as well as traditional physical learning. This finding demonstrates that although there are key resources required specifically for e-learning, there are still traditional resources that need to be given the same consideration even if learning is happening completely electronically.

6.2.3 Schedule of Using E-Learning

The findings on when students access e-learning revealed that although most participants indicated that they followed the campus timetable set by the respective HEIs, there were some cases where students followed their own personalised routine. This finding cited having access to recorded lectures as one of the reasons for being able to personalise learning routines or autonomy; which can be linked back to findings on the types of information or content delivered through e-learning as reported under section 5.5.2.3.1. It has also been noted that student autonomy is one of the enabling factors as reported under section 5.4.1.3; as well as one of the personal conversion factors which influences students' ability to use e-learning effectively in section 5.4.1.3. Thus, HEIs need to consider accommodating different learning types for diverse students by making provision for course material that caters for customised learning.

6.2.4 Types of Information or Content Delivered Through E-Learning

This study identified lectures, which encompassed real-time or live and recorded lectures, as the top category of information delivered through e-learning. From the real-time lecture perspective, the finding can be linked back to the findings on systems used for e-learning under section 5.3.1, which depicted that live or real-time lecturers were accessed via Microsoft Teams, while from the recorded lectures perspective, it has been noted that recordings are used as either the primary method of accessing e-learning as well as a method of catching up or doing revision. Recorded lectures can be linked back to findings on student autonomy reported in section 5.4.1.3 as well as the findings in section 5.4.4.1 which highlighted the accessibility of course content in the form of lecture recordings as one of the technological conversion factors that influenced the ability to use e-learning effectively.

This study also identified course-related material as the content delivered through e-learning; which encompasses content such as past papers, study guides, links, notes, worksheets, extra videos, preparatory material, articles, discussion boards, links to YouTube videos, sites and any other material lecturers felt was necessary for learning. This finding can be linked to the course design technological conversion factor reported under section 5.4.4.3 which highlights elements such as information, instructional objectives, layout, and output and how they can influence e-learning. This demonstrates that the focus should not be solely on the material provided but layout, output, and instructional objectives also need to be factored in.

Tutorials form another category of information delivered through e-learning, identified in this study. This finding encompassed tutorial questionnaires and subsequent interactive sessions to discuss the answers thereof with an assigned tutor. This finding can be linked back to findings on the e-learning system used as it was indicated that the interactive tutorial sessions took place via Microsoft Teams as reported under section 5.3.1.

Finally, this study identified tests and assignments as the final category of information delivered through e-learning. This finding noted that the e-learning system was a centralised platform for specifications, feedback, appraisal, submission and evaluations of these deliverables. This indicated that although it has been noted in section 5.3.1 that in some cases more than one system is used for learning functions, the finding reveals that at least one system is used for all test and assignment-related functions, which aligns with the concept of course design reported under section 5.4.4.3.

While the concept of learning tends to be considered from the lecture or class perspective, these findings have demonstrated that it is only one element of the learning process. Several other categories of information or material are required for learning which should be considered when switching to e-learning. Furthermore, the validity of the information or content types needs to be considered when moved to an online environment, for instance, the security and integrity of tests and assignments need to be maintained online.

6.2.5 Learning Location or Setting

The findings revealed that while the majority of participants accessed their e-learning from home, it is also notable that some could access it from the HEIs' residence areas which demonstrated the flexible nature of e-learning. A study by Ali et al. (2018) that assessed e-learning systems in higher education institutions in Pakistan, revealed that 51% of respondents accessed e-learning from the respective HEI, 39% at home, 5% at work, and 4% at an internet café. It is important to note that the study by Ali et al. (2018) did not take place in the same context as the current study, which could explain the difference in location. This finding is specifically important when considering the use of e-learning for academic continuity under unprecedented circumstances which could subsequently influence the locations of the students without giving them much time to prepare their setting for e-learning. This finding can be linked to the findings which depicted a conducive environment as an enabling factor in section 5.5.2.1.2; and the opposite thereof, an unconducive environment as a hindrance under section 5.5.1.1.4. Furthermore, the

environmental conversion factors further demonstrate how crucial the learning environment is in influencing the ability to use e-learning effectively as reported in section 5.4.3.2.

6.3 THE INFLUENCE OF PERSONAL, SOCIAL, ENVIRONMENTAL AND TECHNOLOGICAL CONVERSION FACTORS ON THE EFFECTIVE USE OF E-LEARNING

The second objective of this study was to describe how personal, social, environmental, and technological conversion factors influence the effective use of e-learning and consequently, answer RQ2: *How do personal, social, environmental, and technological conversion factors influence the effective use of e-learning?*

The thematic findings of this study have led to the identification of the conversion factors influencing the effective use of e-learning by South African HE students during the COVID-19 pandemic. These themes were categorised according to the conversion classifications in the conceptual framework of this study which is an adaptation of Sen's Capability Approach and expands on personal, social and environmental conversion factors by introducing a fourth category, extracted from the results of the systematic literature review referred to as "technological conversion factors".

6.3.1 Personal Conversation Factors

Concentration span is one of the top personal conversion factors which this study identified which has been expressed from two different perspectives. In the first perspective, the findings suggest that low concentration span can be linked to the lack of social presence and interaction, whereby students expressed that they were unable to engage. A similar notion is depicted in the findings on institutional challenges, which highlights lecturer attitude and monotone as a hindrance to students' attention and concentration span. This finding further encourages the notion made by Basahel and Basahel (2018) who suggested that e-learning systems should be modified to increase the level of interaction. Additionally, findings on content access through e-learning under section 5.3.4.4, revealed how impromptu pop-up tests would appear in the middle of a lecture to verify whether students were in attendance and paying attention which is another probable solution HEIs can apply. The other perspective on this finding is that student autonomy or behavioural control can improve the concentration span of students through the assistance of recorded lecture videos which could be paused and rewound. This perspective on the finding can possibly explain why recorded lecture videos were found as one of the top categories of content

accessed via e-learning; which serves as further motivation for HEIs to make use of such content to accommodate such students.

Procrastination was among the top categories which this study found had an influence on effective e-learning and was viewed from two opposing perspectives. One perspective was that procrastination could limit students' learning process, which is consistent with the depiction of procrastination noted in the findings of factors hindering the effective use of e-learning in section 5.5.1.3.1. This perspective further highlights how crucial it is to consider and address procrastination to reduce or eradicate it as a hindrance. The second perspective of this finding, interestingly, was that the autonomy or behavioural control attached to e-learning can assist with overcoming issues with procrastination, whereby students can customise their learning according to their own schedule or routine. This can be supported by the provision of content such as recorded lectures, which can be accessed outside of the fixed, lecture timetable.

This study also identified autonomy or behavioural control as another personal conversion factor, from the perspective that e-learning has given some students more motivation and accountability to self-learn. Interestingly, this finding further reveals that limited social presence, interaction and support outlined in section 5.4.2.2, can be one of the motivating factors for students taking this route, as they realise that there is no one to handhold them. This factor is consistent with the concept of behavioural control which according to Fishbein and Ajzen (1980) can be referred to as an individual's perception of their ability to perform or have control over a behaviour. Findings by Amin and Zaman (2021) revealed that behavioural control had a significant and positive impact on usage behaviour. Consequently, it can be assumed that this finding on autonomy is possibly due to the kind of content available via e-learning such as recorded lectures which can give students more control over their learning process, reported under section 5.3.4.1. This is in contrast to the physical classroom where the option of revisiting past lectures is not possible. HEIs can consider accommodating different learning types for diverse students by making provision for course material that caters for customised learning.

Motivation is another factor this study identified, specifically in the context of how self-driven motivation can positively influence effective e-learning and the source thereof, in this case, was the pandemic itself. A previous e-learning and COVID-19 study by Manjeese (2022) associated improved system acceptability by both students and employees in HEIs in Zimbabwe, with increased motivation. This indicates that motivation is not just a factor for South African HE students but also for those in another SADC country. Active steps need to be taken to keep students motivated to improve the effective use of e-learning.

This study also identified the broad theme of student health as an influencing factor in effective e-learning; which has further been categorised into mental and physical health. The finding on the mental health facet incorporates grief due to death, stress and depression. Interestingly, one participant further linked the source of this finding to isolation, which is a pattern that can be linked to the findings on social presence and interaction in section 5.4.2.2. The impact of limited social presence and interaction has been depicted in previous studies and noted as a hindrance to e-learning (Aboagye et al., 2021; Chung et al., 2020; Kaisara & Bwalya, 2021; Mushtaque et al., 2021; Vershitskaya et al., 2020). An additional probable source of mental health issues was reported by Rotas and Cahapay (2020) who depicted the high demands of e-learning as a source of mental health issues, which in some cases drove students to a point where they considered conceding their studies. Thus, this further highlights the need for HEIs to take the necessary measures so that students do not feel isolated and overwhelmed in the e-learning environment, especially when there is already physical isolation due to the pandemic. Furthermore, HEIs, parents or any other support structures need to actively find ways of ensuring that students receive the necessary support, especially after undergoing such drastic changes to their lives through the transition from physical to online learning and the very nature of the pandemic itself which enforced social isolation. The other facet of student health this study identified was physical health, which was reported as a limitation to the effective use of e-learning and learning in its entirety according to the findings. This finding is similar to previous studies which reported on how compromised physical health can affect e-learning (Mushtaque et al., 2021; Rotas & Cahapay, 2020). Consistently, Manjeese (2022) reported on how student capabilities played a crucial role in the success of e-learning, especially in ensuring that students were able and prepared to use e-learning. Consequently, it can be assumed that any health limitations can be detrimental to the learning experience, this is specifically true when considering the nature and the effects of the COVID-19 virus on health. Thus, both the department of health and education need to consider such stimuli to formulate strategies to optimally support students through health issues.

Only three personal conversion factors can be directly linked to the results of the SLR on the personal factors influencing the use of e-learning. Student autonomy is consistent with the behavioural control factor; motivation is a consistent factor overall; and health can be linked to the student's capabilities, specifically from the perspective of students being able to use e-learning and the assumption that it incorporates physical capability. Firstly, this association indicates that these factors are not unique solely to the usage of e-learning from a functional sense but also the effective use thereof which was the objective of this study. This suggests that the type of use

investigated in this study can empower students in achieving their desired educational outcomes (Burton-Jones & Grange, 2013). Secondly, this indicates that student autonomy, motivation, and health are not only relevant to other developing countries under traditional learning circumstances but also to South Africa, under the unprecedented circumstances of a pandemic. Behavioural intention; computer self-efficacy; user satisfaction; attitude towards use; performance expectancy; habit; experiences with e-learning; adaption; and ICT skills and knowledge are the personal factors from the SLR that were not observed in this study. One of the most obvious reasons for this result is that most of these factors are constructs from theoretical models: UTAUT, TAM, D&M ISS and TOE, which were applied in these studies as outlined in Table 1 in section 2.5.1. Conversely, the current study applied an adaption of Sen's Capability approach coupled with a case study approach which allowed participants to provide in-depth and context-specific details of personal conversions relevant to them, as opposed to theory testing and generalisations. Another possible reason for this difference is the context in which e-learning was used which in this study was the only possible method of learning, thus not optional but rather mandatory. Thus, it can be assumed that factors such as behavioural intention, user satisfaction, attitude towards use, and performance expectancy represent choice or are applied when there are other options which were not necessarily the case in this study. Additionally, factors such as habit and experience with e-learning were not noted, due to the selection criteria of this study which entailed students that used e-learning as the primary mode of education as a manner of ensuring academic continuity due to the pandemic. This suggests that previous experience and habit may have not necessarily been observed before the pandemic.

6.3.2 Social Conversion Factors

The demand between home versus learning responsibilities is the top category of social conversion factors this study identified, which specifies the various cultural dynamics and roles students play in their homes. This finding encompasses the hierarchical expectations of older members of a family regarding the household chores of the younger family members. In addition, it includes gender roles whereby female participants were expected to perform chores that males may not be required to. Finally, this finding also incorporates the parental responsibilities that students who are mothers have towards their children. This finding, specifically related to family members, is similar to findings from previous studies which cited how students were unable to focus due to the distractions and noise from family members in their home environment (Chung et al., 2020; Egielewa et al., 2021; Henaku, 2020). It can be suggested that this factor is particularly illuminated by the removal of the traditional learning environment, where previously a

physical separation could be made between the home and learning environment but is no longer possible. This notion is demonstrated in the findings on the location or setting in which participants indicated e-learning was accessed in section 5.3.5, which depicted that it occurred mostly in the home environment. This finding can be closely linked to findings on the learning environment, an environmental factor influencing effective e-learning reported in section 5.4.3.2. Additionally, the finding can also be linked to the unconducive home environment hindering factor findings reported in section 5.5.1.1.4 as the expectations around chores can serve as a distraction to e-learning especially given that there was no time to prepare homes to accommodate or socialise learning. This finding was not observed in the results of the SLR, possibly due to the difference in cultural dynamics which assign certain responsibilities that may be unique to South Africa specifically. Another possible reason for this could be that this factor has been classified under the conducive home environment factor category in previous studies; while through thematic analysis, the current study has identified the two as two different themes based on the in-depth explanations provided by the participants of this study. A possible way of accommodating this finding can be linked to the personal conversion factor of student autonomy depicted under section 5.4.1.3, which has demonstrated the opportunity of allowing students to personalise their own learning schedule or routine. Thus, students who have demanding home responsibilities can somehow plan schedules that give them more flexibility. Additionally, another possible solution can be to socialise e-learning with family members in a manner which allows them to comprehend and hopefully accommodate the learning demands.

Social presence and interaction are other factors that this study found influenced effective e-learning, from two different perspectives: the lack of as well as the excess thereof. From the lack of social presence and interaction perspective, previous studies have reported this notion as a hindrance to the success of e-learning (Aboagye et al., 2021; Chung et al., 2020; Kaisara & Bwalya, 2021; Mushtaque et al., 2021; Vershitskaya et al., 2020). This finding is no surprise given the social distancing and quarantine restrictions that were imposed, which encouraged limited social presence and interaction. This finding can be linked to findings on mental health reported under section 5.4.1.4, which indicates the adverse repercussions of isolation. Furthermore, this finding can also be linked to the concentration span and procrastination findings in section 5.4.1.1, where the need for increased levels of interaction in e-learning systems should be encouraged (Basahel & Basahel, 2018). The other perspective on these findings, where there is an excess of social presence and interaction which negatively influences their effective use, is consistent with findings by Narh et al. (2019) who highlighted how lack of time management can be a hindrance

to e-learning. Thus, students need to find a balance between educational requirements and social interaction to ensure that their studies are not compromised.

Another social conversion factor this study identified was politics, specifically how student politics and war status can influence the effective use of e-learning negatively. This finding encapsulated how student politics was a distraction to e-learning due to the number of strikes and voting campaigns as well as the involvement of students in political parties and social clubs. The other perspective on this finding depicts how South Africa, being a war-free zone, positively influences e-learning, whereby a participant expressed that students do not need to worry about war but can focus on learning. Al-Azawei et al. (2016) illustrated that unstable societal issues such as corruption and wars can be a challenge to the effectiveness of e-learning in Iraq specifically, thus highlighting that war is not only an influencing factor in countries where it is active but rather how an inactive war can also be considered a positive influencing factor. One could argue that war is an unprecedented event such as a pandemic, whereby in most cases it cannot be predicted ahead of time and has dire repercussions on countries, similar to a pandemic. Thus, war can be equated to a pandemic to some extent, where in both cases, academic continuity measures would need to be considered.

Peer support or community is another social factor found to have a significant role in effective e-learning from two perspectives in this study. Firstly, this finding revealed that students advocated for their disadvantaged peers during the transition to e-learning; which can be linked to findings on the lack of resources required for e-learning reported under section 5.5.1.4.1. This association can be a possible reason as to why some students would advocate for their peers who have access issues, especially as it has been reported under section 5.3.2 that there are several resources required for e-learning which require financial means. The second perspective of this finding is the peer-to-peer support through collaborating groups on social media which can closely be linked to the social presence and interaction reported under 5.4.2.2 as it provides students with some form of alliance. This finding highlights the benefits of social media tools and how they can facilitate collaboration and engagement. Thus, HEIs can consider introducing or encouraging the use of such platforms; or even suggest that collaborative features are incorporated into the e-learning systems. This finding can be linked to the notion of social influence, which refers to students' perception of the influence of university officials, lecturers, and peers in motivating them to use e-learning and has been identified as a factor influencing e-learning in previous studies (Alshehri et al., 2020; Binyamin et al., 2017). Thus, such support systems and a sense of

community need to be fostered not only by HEIs but also by student leaders and students themselves to enable students in the best possible way in their e-learning experience.

Another social conversion factor this study identified was corruption, specifically that of governmental resources that were originally allocated to assist with the transition to e-learning. This finding can be linked to the finding which depicted corruption as a hindering factor to the effective use of e-learning, reported under section 5.5.1.4.2. It has been found that just as with any other information technology initiative, a significant amount of capital investment is required to implement an e-learning system and the lack of funding is a barrier to the success thereof (Al-Azawei et al., 2016; Moakofhi et al., 2017; Tarus et al., 2015; Vershitskaya et al., 2020). Thus, understanding the importance of capital investment further emphasises the effects that corruption has, especially when linked to the findings on resources required for e-learning reported under section 5.3.2. A study by Manjeese (2022) described how government support is required in endorsing the use of new technology and that they can assist by formulating regulations to support use and procurement through favourable taxes and subsidies in higher education which outlines the importance of the government's participation, which based on this finding, is contradicted by corruption. It has also been noted in section 5.5.1.4.1 how the lack of access to resources required for e-learning is a hindrance to e-learning which further presumes the repercussions of this finding.

Economic status is the final social conversion factor this study identified, which outlined the difficulties faced that are attributed to disadvantaged backgrounds as well as the financial implications the pandemic has had on streams of income. This finding can be linked to lack of access to resources, the societal hindrance reported under section 5.5.1.4.1 as it can be assumed that without the financial means nor support, students would not be able to afford the resources required for e-learning as outlined under section 5.3.2. Furthermore, it can be argued that this finding can possibly be worsened by the corruption of government funds as reported under section 5.5.1.4.2, leaving students with limited sources of alternative assistance. Finally, this finding can be linked back to peer support under section 5.4.2.4 which noted how some students advocated for their disadvantaged peers during the transition to e-learning to ensure that they were not left behind as a result of their lack of access.

Two out of the six social conversion factors can possibly be linked to the results of the SLR on social factors influencing e-learning. Although not directly, peer support or communication can be linked to social influence, specifically amongst students; and corruption of government funds can be linked to government support which in this study the contrary was reported. Home versus

learning responsibilities; social presence and interaction; politics; and economic status were social conversion factors unique to this study. One possible reason for this discrepancy could be that the context of the pandemic itself created unique social settings for students which resulted in factors that would not have been previously influential. For instance, the findings on the location or setting where students accessed e-learning as reported under section 5.3.5, revealed that they were limited to their home environment as a result of the social distancing restrictions. Thus, it can be assumed that the gravity of home versus learning responsibilities; social presence and interaction; and peer support factors were amplified due to the context in which this study took place, in comparison to traditional learning circumstances. Additionally, the South African landscape itself could be another reason behind this discrepancy, whereby the influence of factors such as politics and economic status on effective e-learning is particularly dire on South African HE students compared to those from other developing countries. Finally, the social conversion factors identified in this study, contribute to the literature on social factors influencing e-learning, as the gaps identified from the SLR results in section 2.5.3 outlined how this category was understudied. This contributes to the literature on developing countries and also South Africa specifically; and not only studies on e-learning usage but the effective usage thereof.

6.3.3 Environmental Conversion Factors

This study identified electricity as the top environmental conversion factor that influenced the participants' ability to use e-learning effectively, this is reported from the perspective of the lack or outages. This finding is not surprising since it can be linked to the finding which referenced electricity outages as a hindering factor in section 5.5.1.1.3. Electricity has further been identified as one of the resources required for e-learning findings under section 5.3.2, which further presumes the critical importance of this resource and how the lack thereof could affect the e-learning experience. This finding also incorporates an outlier case where a participant outlined having access to back-up electricity through the provision of a generator which may not be available to many as it has been noted that lack of access to resources in section 5.5.1.4.1, as well as economic status in section 5.4.2.6, are some of the social factors which also influence e-learning.

The learning environment, which can either be unconducive or conducive, is another factor this study identified. This finding encompasses how noise levels in the home or residence environment; the position of the home; peak hours; and housing types such as townships or apartment blocks can result in major distractions that influence the ability to learn effectively. A study by Kaisara and Bwalya (2021) highlighted that crowded high-density locations can be a

contributing factor to unconducive learning environments which aligns with the townships or apartment blocks aspect of these findings. This is an aspect that needs to be considered carefully, especially in South Africa where such locations and housing types are especially prevalent. The study by Manjeese (2022) which investigated e-learning in the context of the COVID-19 pandemic in Zimbabwe, also identified the learning environment in the form of noise level and disturbances as influencing factors to e-learning. This demonstrates that this is not a factor unique to South Africa only. Furthermore, this finding can be linked to an unconducive environment which has been identified as a hindering factor in section 5.5.1.1.4 further highlighting how significant this environmental factor is and that it needs to be addressed. This finding on the learning environment also reveals a positive perspective, where some participants expressed that their home environment was favourable for e-learning, which aligns with the advice by Manjeese (2022) who highlighted the importance of guaranteeing a convenient learning environment.

This study also identifies ICT infrastructure as an environmental factor which influences the ability to use e-learning effectively, from two different perspectives. One perspective is that adequate ICT infrastructure has a positive influence on effective e-learning. This perspective has been depicted in the form of the government-supplied infrastructure in a city such as Pretoria where there is access to free Wi-Fi, thus there was no need to further spend money on internet connectivity. This demonstrates the positive effect that government funds can have on the e-learning process if applied correctly, especially as it is reported in the findings on hindrance factors that corruption of government funds is a social hindrance to e-learning as depicted in section 5.5.1.4.2. Another perspective of this finding is that inadequate ICT infrastructure can also result in a negative influence on e-learning, specifically on the network quality in certain areas of the country. This perspective can be linked to internet connectivity and bandwidth issues reported under section 5.5.1.1.1. Additionally, this finding can be linked to the concept referred to as facilitating conditions, which several studies have found had a direct and positive influence on the actual use of e-learning (Ain et al., 2016; Aldholay et al., 2018; Ali et al., 2018; Al-Mamary, 2022; Alshehri et al., 2019, 2020; Yakubu & Dasuki, 2018, 2019). It is noteworthy that the construct of facilitating conditions according to Venkatesh et al. (2003), incorporates both organisational and technical infrastructure, however, ICT infrastructure was coded as a completely separate theme in this study. There is, however, another study which focused on infrastructure separately and subsequently found that the unavailability of internet connectivity, issues with power supply, and inadequate laboratory were some of the critical infrastructural concerns raised by students (Buabeng-Andoh & Baah, 2019).

Closely linked to ICT infrastructure and encompassed in the facilitating conditions construct as described by Venkatesh et al. (2003), is organisational support, which is another environmental factor this study identified. This finding is firstly depicted by the lack of support provided by HEIs to students during the transition to e-learning. This is consistent with previous studies which revealed the lack of responsiveness and lack of support provided to students by lecturers (Rotas & Cahapay, 2020; Selvanathan et al., 2020). Secondly, this finding also incorporates the opposite, the positive support provided by some HEIs by providing free data to students for internet access and subsequently, for e-learning. This finding is similar to findings by Buabeng-Andoh and Baah, (2019) who indicated that organisational support in the form of training and support had a positive influence on e-learning. Similarly, management support was an influencing factor in e-learning in the study by Manjeese (2022), with a specific focus on the support provided to employees and students in making usage feasible and in ensuring that there was adequate availability of resources.

Weather is another environmental conversion factor this study identified as an influence on the ability to use e-learning effectively, specifically the effect of bad weather on internet connectivity and subsequently e-learning use. This finding can be linked to the findings of resources required for e-learning in section 5.3.2.2, of which internet connectivity was amongst the top resources which presume the effects of this finding on e-learning. The impact of bad weather on internet connection has been previously reported by Rotas and Cahapay (2020) who indicated that it was a hindrance to e-learning. Thus, this finding can be linked back to that of ICT infrastructure in section 5.4.3.3; and indicates that careful consideration needs to be taken into account of the infrastructure of this country, not just for e-learning but for all other domains which rely on internet connection.

Three of the five environmental conversion factors identified in this current study can be linked back to those identified from the results of the SLR on environmental factors influencing e-learning in developing countries. The learning environment factor is consistent across both findings and literature; and highlights the importance of a conducive home environment for e-learning. Although ICT infrastructure and organisational support have been coded as two separate themes in this study, both are consistent with facilitating conditions; while organisational support is also consistent with management support. Firstly, this association indicates that these environmental conversion factors are not only relevant to studies on the usage of e-learning from a functional sense, but also to the effective use thereof which was part of the objectives of this study. This suggests that the type of use investigated in this study can empower students in achieving their

desired educational outcomes (Burton-Jones & Grange, 2013). Secondly, this indicates that the basis of the learning environment, ICT infrastructure and organisational support is not only relevant to other developing countries under traditional learning circumstances but also to South Africa, under the unprecedented circumstances of a pandemic. Electricity and weather are the two environmental conversion factors unique to this study. Although electricity outages were identified in the results of the SLR on e-learning challenges in developing countries, it is not a factor that was identified in the results of the SLR on the environmental factor influencing e-learning in developing countries which aligns with this section of the findings. One of the possible reasons for this may be that previous studies did not identify it as an influencing factor in e-learning usage but rather just as a challenge when investigated. It must also be noted that most of the factors identified from the SLR results are constructs from theoretical models: UTAUT, TAM, D&M ISS and TOE, which were applied in these studies as outlined in Table 1 in section 2.5.1. Conversely, this current study applied an adaption of Sen's Capability approach coupled with a case study approach which allowed participants to provide in-depth and context-specific detail of personal conversions relevant to them, as opposed to theory testing and generalisations. Another possible reason for this difference is the nature of the context in which e-learning was used which in this study was the only possible method of learning, thus not optional but rather mandatory. Thus, perhaps electricity and weather were more influential when observed in the context of the pandemic.

6.3.4 Technological Conversion Factors

Course content, specifically the accessibility of lecture recordings provisioned through the e-learning system is a technological conversion factor this study identified from two opposing perspectives. From one perspective, the finding has been reported to have a positive influence on the ability to use e-learning effectively which incorporates the ability of students to access videos without having to download, as well as the ability to save and watch the videos at a later stage. The second perspective involves the inaccessibility thereof, which has been found to have a negative influence on e-learning; this incorporates not having the option to toggle through the speed and points of the videos. This finding is consistent with findings by Almaiah and Alyoussef (2019) who indicated that course content support, suitable instructional methods and the utilisation of multimedia features with compact content used to encourage engagement and motivation of students, had a positive impact on the actual use of e-learning. This finding can also be linked to the findings on content access through e-learning under section 5.3.4.1, which identified the live lectures and recorded lecture videos as the top categories of content accessed

by participants of this study. This association further presumes the need to ensure that students' e-learning system's content is aligned with what is required by students. This finding can also be linked to the finding on learning autonomy or behavioural control, which was reported in section 5.4.1.3, where the availability of course content such as lecture videos, enabled participants to work according to their own routine and encourages self-learning.

E-learning course administration was another technological factor which this study identified. This finding notes that e-learning is only as good as the person using it, thus, whichever system shortcoming lecturers have will be mirrored through their delivery through e-learning which subsequently has a negative influence. Another perspective of this finding is around the different course delivery styles; there not being a consistent method of course administration across all lecturers, even those in the same HEIs. Similar findings have been revealed by Almaiah and Alyoussef (2019) who reference the construct of instructor qualities and behaviour which encompassed self-efficacy, attitude towards e-learning, experience and incentives for instructors. The findings by Almaiah and Alyoussef (2019) revealed that instructors needed to work on ensuring that they replicate the classroom environment on the electronic platform as a way of encouraging students to accept and embrace the new medium. Thus, any issues arising from the course administration or delivery need to be addressed and reported as a hindrance to the success of e-learning (Moakofhi et al., 2017; Rotas & Cahapay, 2020; Vershitskaya et al., 2020).

Another factor this study identified was course design which is found to positively influence the ability to use e-learning effectively which encompasses the ease of navigation through course content and material without much hassle. This finding is similar to that by Almaiah and Alyoussef (2019) who identified course design as an influencing factor in e-learning usage and consisted of elements such as information, instructional objectives, layout, and output. This finding can be linked to the finding on content that is accessed through e-learning in section 5.3.4, which identified lecture videos, tests and assignments, course material and tutorials as categories of the content accessed through e-learning. Consequently, the design, layout and output of such course content needs to be carefully considered by lecturers and course conveners to ensure that students can work through the content without much difficulty.

The usability of an e-learning system is another technological factor this study identified that influenced the ability to use e-learning effectively and has been noted from two opposing perspectives. Firstly, limited intuitive navigation and user-friendliness of a system can result in frustration and anxiety which influences usage negatively, while from another perspective, a simple user interface, ease of use and a standardised system design can have a positive influence

on the effective use of e-learning. Similarly, findings by Manjeese (2022) revealed that students desired the features of the e-learning system to be simple, user-friendly and to be an imitation of the face-to-face traditional classroom environment. This finding can also be linked to the concept of effort expectancy reported in a study by Buabeng-Andoh and Baah (2019) which implied that students would use technology if they deemed it easy to use and not when it is deemed to be difficult. Consequently, from this finding, it can be recommended that designers and developers of e-learning systems need to consider the aspect of usability when configuring e-learning systems to ensure that they are user-friendly to encourage effective use.

This study also identified system quality or performance as an influencing factor, specifically from a negative perspective as issues with performance and random system glitches were depicted by participants. This finding also revealed that a probable contributing factor to quality or performance issues can be due to increased system access demand as a result of the transition to e-learning which was not met by an increase in system capacity and resources to match it. A study by Cidral et al. (2018) found that system quality had a negative and insignificant influence on the use of e-learning, which was not the excepted outcome. A possible reason for this difference in findings could be the nature and context in which e-learning was used in the study by Cidral et al. (2018) in comparison to this study where e-learning was mandatory and the only option for learning. Thus, HEIs need to consider the volumes of usage when factoring in e-learning transitions from limited usage to extensive usage to avoid issues with system capacity and performance.

System support and help in transitioning to e-learning is another technological factor this study identified and incorporates support and training. It was noted how easy it was to connect and obtain assistance through details made available on the e-learning system. This finding also reveals that short “how to” tutorials also had a positive influence on e-learning, although it was expressed that increasing the durations would have been more beneficial. Findings by Alshehri et al. (2019) revealed that technical support had a significant influence on the use of e-learning which was characterised by the support a university provides to learners in a manner that is effective and efficient. The aspects outlined in that study were the insufficiency of system training; lack of IT support availability; and the substantial amount of time the IT group took in reacting to student requests. Furthermore, previous studies on e-learning in developing countries have flagged inadequate technical support as a hindrance (Al-Azawei et al., 2016; Karkar et al., 2020; Moakofhi et al., 2017; Tarus et al., 2015). Thus, this demonstrates the need for ensuring that students have adequate system support options to ensure that they are well-equipped in utilising

the e-learning system. System help and support services need to be considered not only at an HEIs level but also by IT support, designers and developers of such systems to ensure that students can get assistance when required without much hassle.

The final technological factor this study identified, experience and exposure to e-learning systems, was found to have a negative influence when inconsistent systems were used. This finding revealed the frustrations students experienced when faced with the transition between different systems, not only at different HEIs but also in cases where different systems were used in the same HEIs. A study by Binyamin et al. (2017), investigating the factors influencing students' use of LMSs, found that experience, which indicates the number of years a student uses e-learning, was found to have a positive influence on the actual use of e-learning in developing countries. Thus, it can be understood why students would be frustrated with the introduction of different e-learning systems as it only takes away the accumalated experience with the preceding tool. A possible reason for this could be that HEIs had to switch between systems due to the increased scope of learning attributed to the pandemic which resulted in e-learning being used as the primary method of education and not just for generic learning functions. This finding can be linked to findings on system help and support reported under section 5.4.4.7, highlighting the importance of ensuring that students receive the necessary training and support when transitioning to new e-learning systems.

Five out of the eight technological conversion factors identified in this study can be associated with those identified from the results of the SLR on technological factors influencing e-learning in developing countries. Course content; course design; usability; system quality; and technical support are consistent across the findings of this study and the reviewed literature. Firstly, this connection indicates that these technological factors are not only relevant to studies on the usage of e-learning from a functional sense, but also to the effective use thereof which was part of the objectives of this study. Secondly, this indicates that the basis of the influence of course content; course design; usability; system quality; and technical support is not only relevant to other developing countries under traditional learning circumstances but also to South Africa under the unprecedented circumstances of a pandemic. E-learning course administration; system design; and experience with e-learning are three other technological conversion factors unique to this study. It must also be noted that most of the factors identified from the SLR results are constructs from theoretical models: UTAUT, TAM, D&M ISS and TOE, which were applied in these studies as outlined in Table 1 in section 2.5.1. Conversely, this current study applied an adaption of Sen's Capability approach coupled with a case study approach which allowed participants to provide in-

depth and context-specific detail of personal conversions relevant to them, as opposed to theory testing and generalisations. Another possible reason for this difference is the nature of the context in which e-learning was used which in this study was the only possible method of learning, thus not optional but rather mandatory. For instance, e-learning course administration has a bigger impact in the e-learning environment since the entire course governance takes place online and subsequently, any issues thereof will have a significant effect on all the elements of the course, while for system design, the finding demonstrated that students wanted it to mimic the face-to-face classroom environment as much as possible. Finally, experience with the e-learning system itself may matter more now, since it is used holistically as opposed to basic functions use.

6.4 FACTORS HINDERING AND ENABLING THE EFFECTIVE USE OF E-LEARNING

The third objective of this study was to describe the factors hindering and enabling the effective use of e-learning by South African HE students and consequently answer RQ3: *How is the effective use of e-learning by South African HE students hindered and enabled?*

The thematic findings of this study have led to the identification of factors hindering the effective use of e-learning by South African HE students during the COVID-19 pandemic. These themes were further categorised into four classifications identified in the literature review section which consist of infrastructural; institutional; individual and societal.

6.4.1 Infrastructural Factors

The findings of this study identify internet connectivity and network issues experienced by students as the top category of factors hindering the effective use of e-learning. This finding is consistent with the findings of several other studies on HEI e-learning challenges in developing countries, which also identified internet connectivity-related issues as hindrances (Aboagye et al., 2021; Adnan & Anwar, 2020; Chung et al., 2020; Egielewa et al., 2021; Kaisara & Bwalya, 2021; Karkar et al., 2020; Koponen et al., 2011; Moakofhi et al., 2017; Mushtaque et al., 2021; Narh et al., 2019; Vershitskaya et al., 2020; Yakubu & Dasuki, 2021). This finding further reveals the role that geographical location can play concerning network strength or quality in certain cases which can be attributed to poor network and signal coverage, especially in remote areas. This issue is not unique to South Africa as the same issue has been reported in other developing countries such as Afghanistan, Ghana, Kenya, Malaysia, Philippines, and Uganda (Henaku, 2020; Mohammadi et al., 2021; Mutisya & Makokha, 2016; Rotas & Cahapay 2020; Selvanathan et al., 2020; Twinamasiko et al., 2021). This finding suggests that there is a need to improve the ICT

infrastructure in remote areas to have more reach, especially in the context of the pandemic as HEIs and other institutions were closed which forced students to go home, which for some could have been remote areas. In addition, interestingly, this finding also reveals that there are some HEIs in South Africa which provided students with a capped amount of data; although participants further indicated that the amount was not enough and was soon depleted. The same concept was highlighted by Tarus et al. (2015) who demonstrated that even in cases where the government subsidised the bandwidth for public universities, the cost was still significantly high, and it was difficult to attain enough bandwidth, while Chung et al. (2020) found that although some telecommunication companies in Malaysia provided limited broadband to students for free, it was still not sufficient for students to complete their e-learning functions. This finding can be linked to the findings on the content or information which is accessed via e-learning, reported under section 5.3.4. The different formats of content such as videos and multi-media course material can provide probable justification as to why more data is required for e-learning purposes. The urgency of addressing internet connectivity and network issues is further elevated as it has also been identified as one of top resources required for e-learning, reported under section 5.3.2.2, noting that without adequate internet connection, e-learning as per the definition and criterion of this study, is not possible. Thus, government, HEIs and possibly telecommunication companies need to work on strategies for improving ICT infrastructure in all parts of South Africa as well as ensuring that students have a sufficient amount of data to perform their learning duties, as it is not a luxury but a means to academic continuity. Furthermore, designers and developers of e-learning systems need to factor in these limitations to make the content more accessible amidst these issues.

Another top factor related to the effective use of e-learning identified by this study is linked to issues with electronic devices; from the perspective of students not having access to a device and the quality thereof. From an access perspective, several preceding studies have reported the lack of access to laptops or computers as a challenge to the success of e-learning (Idris & Osman, 2015; Mohammadi et al., 2021; Tarus et al., 2015; Twinamasiko et al., 2021). This access issue can also be linked to findings on societal challenges, specifically the theme of the lack of resources reported in section 5.5.1.4.1 mostly attributed to economic status or financial constraints. Additionally, from a device quality perspective, issues on measures such as performance and compatibility have also been reported as hindrances in previous studies (Aboagye et al., 2021; Chung et al., 2020; Henaku, 2020). Similar to the findings on internet connection, electronic devices form another category which has been identified as top resources required for e-learning, which is under-reported 5.3.2.1, and further increases the urgency around

addressing this challenge as e-learning cannot take place without an electronic device. The findings of this study also revealed that the laptop was the device of choice, while the cell phone was mostly used as a secondary device to the laptop. This indicates the importance of providing electronic devices for students, not only from an access perspective but in aligning the specifications of the devices to those of the e-learning systems to avoid compatibility issues.

Electricity outages or load-shedding is another factor this study identified as a hindrance to effective e-learning. Interestingly, the same factor has been reported as a challenge to e-learning by several studies outside of the context of South Africa: Afghanistan, Botswana, Nigeria, Pakistan, Philippines (Egielewa et al., 2021; Moakofhi et al., 2017; Mohammadi et al., 2021; Mushtaque et al., 2021; Rotas & Cahapay, 2020). This finding suggests that electricity outages are not a challenge unique to other developing countries only or the SADC region such as Botswana but also in the context of South Africa specifically. Electricity is also identified as one of the resources required for e-learning in this study, reported in section 5.3.2, and the lack thereof can be a source of frustration for students. This suggestion is consistent with the findings by Bishnoi and Suraj (2020) who referred to electricity outages as a source of a high degree of apprehension among students when completing online activities such as examinations. Active steps need to be taken in ensuring that there is sufficient electricity available to students or rather, alternative sources thereof to ensure that e-learning is not disrupted by these outages. Although, Adewale and Daramola (2013) reported that even in cases where an alternative source was deployed in the form of solar energy, it was not adequate in solving issues about the lack of electricity; and that generators created a recurring expense to the cost of maintaining e-learning by the HEI. This demonstrates the complexities and implications of deploying alternative sources of energy, especially in a landscape where lack of access to resources has already been noted.

An unconducive home environment is a fourth and final theme under the infrastructural challenges classifications that participants have expressed as a challenge to their effective e-learning. This finding is consistent with previous studies in other developing countries, Pakistan and the Philippines, where students have reportedly struggled to find study areas to do e-learning (Mushtaque et al., 2021; Rotas & Cahapay, 2020). This finding is especially interesting noting the social distancing protocols that were promoted as a result of the COVID-19 pandemic which left students with no access to educational institutions as depicted in the findings in section 5.3.5.1 which reported that the home environment was the location or setting where most participants indicated they accessed their e-learning from. This finding can possibly be attributed to quarantine conditions as reported by Bishnoi and Suraj (2020); crowded high-density locations as suggested

by Kaisara and Bwalya (2021); or students who are unable to focus due to the distractions and noise from family members in their home environment (Chung et al., 2020; Egielewa et al., 2021; Henaku, 2020). Noting that e-learning in this current study was used as a method for academic continuity due to the pandemic, it can be suggested that limited time was provided to prepare the home environment for e-learning which was one of the reasons why this challenge was prevalent.

Internet connectivity and bandwidth issues, electricity outages and an unconducive home environment are themes that were identified in this study as well as in the literature reviewed in the SLR which identified challenges that hinder the success of e-learning in HEIs in developing countries. This suggests that not only are these challenges relevant to developing countries but also to South Africa. Furthermore, this suggests that these challenges are not only prevalent in the context where e-learning usage is being investigated but also when the effective use (the actual benefits) of e-learning is being investigated, where the usage goes far beyond just functionality. Finally, these three themes also further highlight that these are challenges experienced by students when students use e-learning under traditional circumstances as well as during unprecedented circumstances such as for academic continuity due to the pandemic.

The theme concerning issues related to electronic devices on the other hand, was the only infrastructural challenge, which is unique to this study, possibly because there was no alternative way to access e-learning such as a computer laboratory, as acknowledged by Moakofhi et al. (2017) and Mutisya and Makokha (2016); or off-campus internet facilities mentioned by Idris and Osman (2015). This assumption is further supported by the finding of this study which depicts that electronic devices are amongst the top resources required by e-learning, further suggesting the need for private access to these devices as opposed to the communal option which was available through laboratories and other internet facilities. This could possibly also explain why inadequate computer laboratories were one of two infrastructural challenges identified in the literature reviewed in the SLR but not in the findings of this current study. Additionally, the only other infrastructural challenge identified in the results of the SLR but not in this study is that of ICT infrastructure which can be argued to encompass the challenge of internet connectivity and bandwidth issues.

The themes identified under the infrastructural enabling factors category are internet connectivity; a conducive home environment; electronic devices; and system quality. The findings of this study identified internet connectivity as the top category of factors enabling the effective use of e-learning. This finding placed considerable emphasis on connective strength and how

geographical location could be a major influence thereof. This finding is consistent with the network quality subset of the ICT infrastructure environmental conversion factor depicted in section 5.4.3.3. Interestingly, this finding is a reversed perspective of the infrastructural hindering factor depicted as internet connectivity and network issues in section 5.5.1.1.1. This demonstrates that not only is internet connection an enabler, but issues thereof can become a hindrance, further enhancing the significance of this factor across both perspectives. An electronic device, a laptop specifically, was another category of factors identified in enabling the effective use of e-learning. Similar to internet connectivity, this finding is another reversed perspective of the hindering factor noted as issues with electronic devices reported in section 5.5.1.1.2, further highlighting the significance of the need for adequate electronic devices required for e-learning, consistent with e-learning resource requirements listed in section 5.3.2.1. This study identified a conducive learning environment as another factor enabling the effective use of e-learning. This finding incorporated the impact that the number of people sharing a home can have on the learning experience, which could be negative if there are many. Another perspective of this finding was the obvious contrast between the classroom environment versus the home environment which by design was inherently different but interestingly, the participant expressed how it was the home environment that was preferred due to the latter being noisy. These two perspectives demonstrate that the home environment has varying aspects which may differ between students and even home or family setups. Finally, the final infrastructural enabling factor this study identified was system quality which incorporates the effectiveness of the system itself. This finding can be linked to the same theme depicted under technological conversion factors in 5.4.4.5, placing further emphasis on the importance of the processing, performance and efficiency of a system. Unlike the three other infrastructural enabling factors identified, the reversed perspective of system quality was not noted in the infrastructural hindering factors.

6.4.2 Institutional Factors

Lecturer-related facets, specifically attitude and tone are an institutional theme that this study identified as hindering the effective use of e-learning, which encompasses the lack of empathy; lack of understanding; and overall lack of support demonstrated by lecturers towards students. It is important to note that this is not an individual challenge as the unit of analysis of this study is South African HE students and not lecturers, hence the lecturers represent the institution classification. This finding may be attributed to the minimum interaction lecturers have with students as a result of the physical distance brought about by the transition to e-learning. This is consistent with previous studies which reported the discontentment students had with the

responsiveness and/or the lack of support provided by lecturers (Rotas Cahapay, 2020; Selvanathan et al., 2020). Additionally, this finding also incorporates the speaking tone or pattern of lecturers which some participants suggested had a negative influence on their attention or concentration span, specifically in a negative manner when it is a monotone voice. The same challenge has been previously reported by Narh et al. (2019) who highlighted that the speaking pattern of lecturers made it difficult for students to understand topics. Such a hindrance may further prompt students to approach e-learning independently and not attend lectures. This is a notion that has been previously reported in a study by Mutisya and Makokha (2016) who outlined how a large portion of students who were registered for online education would just download material and read it independently as opposed to attending lectures. This finding can possibly be linked to findings on limited system training in section 5.5.1.3.1, in that lecturers are not trained on how to use the microphone or project accordingly in this environment, thus indicating the need for HEIs to ensure that appropriate user training is not only given to the lecturers but to all other users of e-learning systems. Another potential reason for this challenge could be linked to change-management-related issues as reported by Almaiah et al. (2020); or resistance to change as outlined by Basahel and Basahel (2018); which could all be managed through the necessary e-learning policies, the lack thereof can also be viewed as a hindrance according to Karkar et al. (2020). An increase in social presence and interactivity as advised by Basahel and Basahel (2018) could be another potential solution to this challenge.

The limited system training provided by the HEIs is another hindering factor which this study identified and has been depicted from both the perspective of lecturers and students. It has further been highlighted that this finding has been one of the impediments to realising the full benefits of an e-learning system as certain features and functionalities were only identified or stumbled upon by chance after long periods after the adoption thereof. Similar findings were previously reported whereby the lack of training provided by HEIs was highlighted as a hindrance to e-learning (Basahel & Basahel, 2018; Idris & Osman, 2015). This finding can be linked to the findings in section 5.2 which confirmed that e-learning was not the primary method of learning before the pandemic which could suggest that there is also a lack of experience in using e-learning as a primary method, further promoting the need for training to accommodate the transition.

The themes of lecturer attitude and tone as well as limited system training are unique to the findings of this study, while financial constraints; lack of institutional stakeholder collaboration; e-learning administration issues; copyright issues; inadequate technical support; privacy and security issues; and contextual configuration challenges are the institutional hindering factors that

were identified in the results of the SLR but not in this study. A possible reason for this difference could be that the current study was conducted from the perspective of the students and not the HEIs, thus participants were expressing challenges that affected them directly. The physical distance which exists between the HEIs and students could be another possible reason for this, resulting in the replacement of the perception of an institution with the e-learning system. Finally, noting that the results of the SLR had limited coverage on e-learning studies in the context of the pandemic, it can be assumed that the hindering factors previously reported occurred when the HEIs and students had enough time to transition to e-learning or when it was not assigned as the primary method of learning.

The themes identified under the institutional enabling factors category were the support from HEI and course content. The findings of this study identified support from HEI as a factor enabling the effective use of e-learning. The support included not just support from the lecturers but also from the tutors as well as IT support. This finding is similar to organisational support reported as an environmental conversion factor in section 5.4.3.4 as well as that of technical support reported as a technological conversion factor in section 5.4.4.7. Course content was another enabling factor this study identified which incorporated the importance of both hardcopy and electronic material required for e-learning. This finding made specific reference to textbooks, pens, notepads, and lecture recordings, which is aligned with the content required for e-learning reported in section 5.3.4 which outlines live lecture videos; lecture recordings; course material; tutorials; tests; and assignments. This finding can also be linked to the same theme depicted as a technological conversion factor in section 5.4.4.1 which highlights the importance of ensuring that relevant course content is provisioned for students.

6.4.3 Individual Factors

Procrastination is the one and only student or individual factor this study identified as a hindrance to the effective use of e-learning by South African HE students for academic continuity. This finding can be linked to the findings on the lecturers' attitude and tone reported in section 5.5.1.2.1 which can result in students losing interest or motivation in e-learning. Another probable reason for this finding could be linked to findings from a previous study by Narh et al. (2019) which reported that the lack of time management by students was a hindrance to e-learning. Finally, the findings on the learning schedule or routine reported in section 5.3.3 could also be a contributing factor to procrastination as e-learning has created the opportunity to learn independently as opposed to following an on-campus schedule. This assumption can be supported by the type of material that can be accessed through e-learning as outlined in section 5.3.4.1, specially recorded

lectures. A possible solution to procrastination may involve the HEIs encouraging lecture attendance and interaction as per the findings on the types of content delivered through e-learning under section 5.3.4.4; whereby a participant depicted how impromptu pop-up tests would appear in the middle of a lecture to verify whether students were in attendance and paying attention.

Resistance to change; lack of awareness; workload management; limited ICT skills and training; lack of social presence; and health issues are the student or individual hindering factors that were identified in the results of the SLR but not in this study. One possible reason for this discrepancy could be that the context of the pandemic itself did not make it possible for students to be resistant to change because they did not have any other options for learning than through e-learning. The same notion can be held for lack of awareness as it can be suggested that some form of awareness was made by the HEIs in communicating such a transition. In addition, although workload management was not coded as a separate theme in this study, one could suggest that it had a slight link to the finding on the factor of procrastination. In addition, limited ICT skills and training; social presence; and health were not observed directly as hindering factors, but all three have been depicted in the conversion factors reported under section 5.4. Thus, it could be possible that the participants responded differently.

The themes identified under the individual enabling factors are student autonomy and motivation. This study identified student autonomy as one of the factors enabling the effective use of e-learning which emphasized students customising their learning experience according to their preferences. This finding is consistent with student autonomy identified as a personal conversion factor under section 5.4.1.3 which was attributed to access to e-learning content such as lecture recordings reported under section 5.3.4.1. Motivation was another individual enabling factor that this study identified; from the perspective of students having the drive or encouragement to pass. This finding is consistent with the motivation personal conversion factors depicted in section 5.4.1.5.

6.4.4 Societal Factors

The lack of access to resources required for e-learning is a societal hindering factor identified by this study. Although this factor is recognised in a broad sense, it can also be directly linked to the category of findings on electronic devices-related challenges which reveal a lack of access to an electronic device as a hindering factor. One of the reasons behind this finding as described by some of the participants, was the financial constraints students experience in meeting their e-learning specifications. The same finding has been demonstrated by other studies on e-learning

challenges in developing countries, specifically Ghana, Namibia, Nigeria and Iran (Aboagye et al., 2021; Egielewa et al., 2021; Kaisara & Bwalya, 2021; Mohammadi et al., 2021). This finding can be linked to the findings on resources required to access e-earning reported under section 5.3.2; which provides a detailed varying list which requires financial means. This finding may have also been escalated by the COVID-19 pandemic as demonstrated in a study by Rotas and Cahapay (2020) which revealed that students were not able to find jobs to support their learning needs as a result thereof.

This study identified corruption as another hindering societal factor, specifically that of government funds which interestingly were provisioned to assist with the transition to e-learning. The e-learning resource-related hindrances which were discussed earlier, namely, electronic devices-related challenges and lack of access to resources, can possibly be related to corruption as one of the potential reasons why students were experiencing those hindrances. Furthermore, this finding can also potentially be linked to the limited e-learning system training provided by HEIs reported in section 5.5.1.3.1 if it can be argued that the government funds were to be allocated to training. This hindrance is particularly critical as several previous studies found that a significant amount of capital investment is required to implement an e-learning system and the lack of funding is a barrier to the success thereof (Adewale & Daramola, 2013; Al-Azawei et al., 2016; Moakofhi et al., 2017; Tarus et al., 2015; Vershitskaya et al., 2020).

Although other societal factors such as cultural, language barrier and politics were noted in reviewed literature but not observed as hindering factors in this study, some have been noted under other sections of this study. The cultural dynamics was observed as a social conversion factor under section 5.4.2.1 which depicted the conflict between home and learning responsibilities, while the politics factor was observed under section 5.4.2.3.

Finally, the only societal enabling factor this study identified was financial means, which outlined the importance of finances in being able to provision resources required for e-learning. This finding can be linked to economic status noted under section 5.4.2.6, which outlined the difficulties faced that are attributed to disadvantaged backgrounds as well as the financial implications the pandemic has had on streams of income. This finding can also be linked to lack of access to resources, the societal hindrance reported under section 5.5.1.4.1 as it can be assumed that without the financial means nor support, students would not be able to afford the resources required for e-learning as outlined under section 5.3.2.

6.5 A DIGITAL CAPABILITY FRAMEWORK FOR ACADEMIC CONTINUITY AMONGST SOUTH AFRICAN HIGHER EDUCATION STUDENTS

This section presented detailed discussions on three objectives of this study and described: the use of e-learning by South African HE students; how personal, social, environmental and technological conversion factors influence effective e-learning for academic continuity in a developing country's context; and the factors hindering and enabling the effective use of e-learning by South African HE students. Digital capability is synonymous with the effective use of e-learning, which is argued as a way of ensuring academic continuity for HE students. Consequently, this study conceptualises a digital capability framework for academic continuity amongst South African HE students in the context of unprecedented circumstances, depicted in Figure 22 below. This digital capability framework holds the perspective that the conversion factors can influence the degree to which students can produce capabilities from e-learning. As a result, this framework is formulated on the personal, social, environmental and technological conversion factors observed in this study as well as the employment of the CA as a conceptual lens to understand the various influencing factors. Thus, the digital capability framework for this study focuses on the resource (e-learning); four categories of conversion factors; and students' capabilities, which is effective e-learning for academic continuity where the traditional face-to-face classroom method is unavailable. It must be noted that the ability to use e-learning effectively does not necessarily guarantee educational achievement but increases the probability of achieving it. This aligns with the notion of effective use outlined by Burton-Jones and Grange (2013) who defined effective use as the type of use of a system that empowers users to achieve their desired outcomes, where systems are not implemented just to be used in a functional sense but rather used to achieve goals. It must be noted that the scope of this digital capability framework does not expand to investigate educational achievement as it is not part of the objectives of this framework. An expansion to this framework is the incorporation of the infrastructural, institutional, individual, and societal factors or challenges which this study has identified to hinder the effective use of e-learning. Additionally, infrastructural, institutional, individual, and societal factors which have been identified to enable the effective use of e-learning have also been incorporated to this digital capability framework. This framework offers a comprehensive consolidation of factors enabling and hindering effective e-learning; how personal, social, environmental and technological factors influence e-learning use and students' ability of converting e-learning into opportunities or capabilities; and guide how e-learning can be used effectively for academic continuity amongst South African HE students.

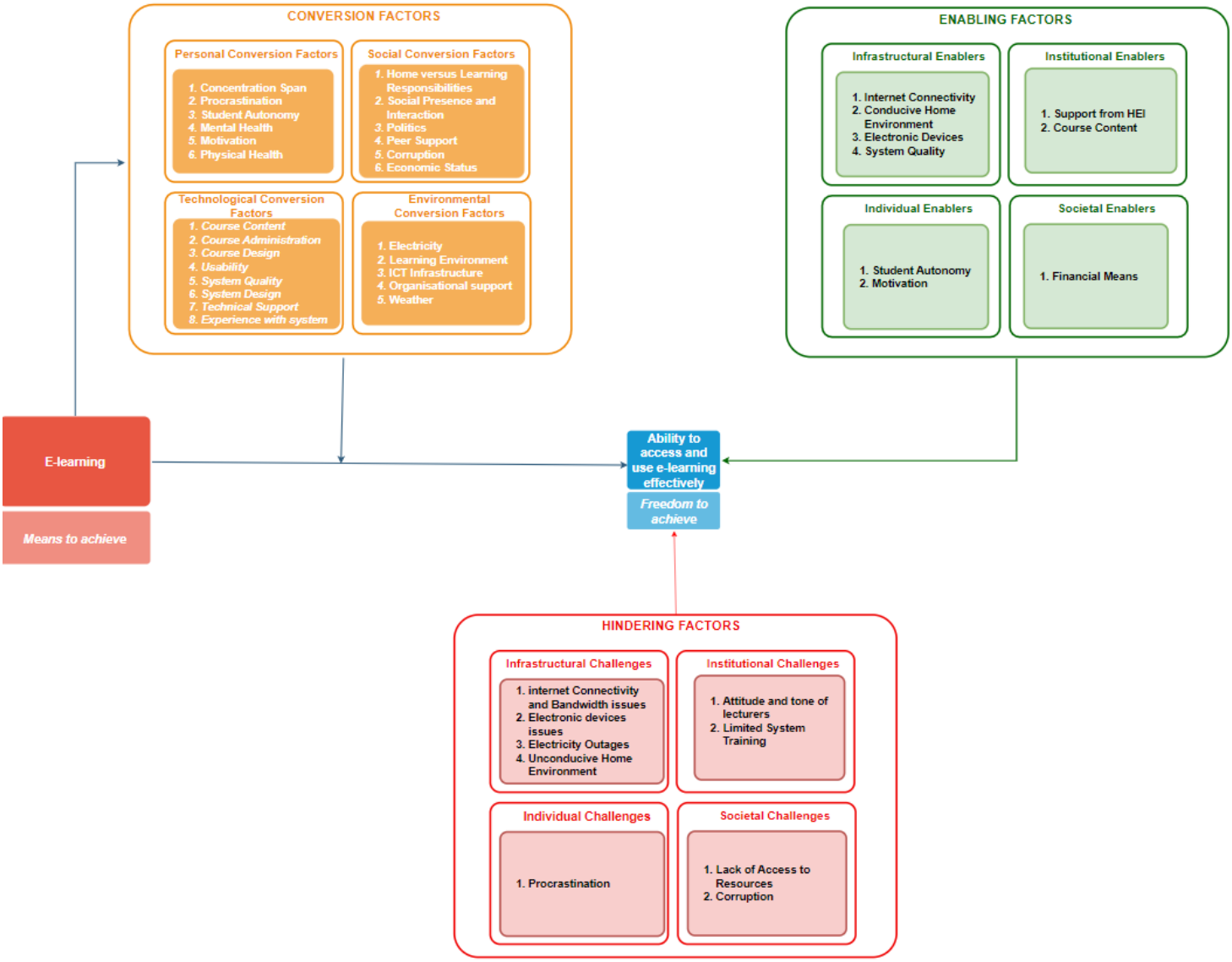


Figure 22: *A Digital Capability Framework for Academic Continuity amongst South African Higher Education Students*

CHAPTER 7

7 SUMMARY AND CONCLUSION

The purpose of this study was to explore and describe the effective use of e-learning during unprecedented circumstances such as the COVID-19 pandemic, to conceptualise a digital capability framework for academic continuity amongst South African HE students. To gain the objectives of this study, qualitative methods were employed using semi-structured interviews of 12 students, both undergraduate and postgraduate, registered in any South African HE who used e-learning as the primary method for education where traditional face-to-face classroom learning was not available. The Thematic analysis method was applied to identify, analyse and infer patterns or themes in the data.

7.1 RESEARCH QUESTIONS

The following three research questions were part of the research that assisted in identifying the key responses to research objectives and criteria.

7.1.1 RQ 1: How Do South African He Students Use E-Learning?

This study revealed that there was an equal split between HE students who use more than one system or tool for e-learning and those who use one centralised system for all their learning functions. An interesting insight was those who specified the use of more than one tool and referenced Microsoft Teams as the video conferencing tool which was used for live lectures and/or tutorial sessions. A possible explanation could be that the pre-existing student portal did not have the live lecture functionality and was used for all other learning functions except for the classroom. This study identified that the key resources that students required to access e-learning were laptops, phones, internet connection, exam pads, textbooks, iPad, electricity, browser, and mobile applications. The types of content or information delivered through e-learning were live lectures, lecture recordings, tutorials, tests, assignments, and course material such as slides, past papers, study guides, links, notes, worksheets, extra videos, preparatory material, articles, discussion boards, links to YouTube videos, sites, and any other material lecturers felt was necessary for learning. The findings also revealed that while most HE students followed a learning timetable formulated by their HEIs, some followed their own personalised learning routine, exhibiting an element of student autonomy. Finally, the majority of participants accessed e-learning from their homes while some accessed it from their HEI residences but as a secondary location.

7.1.2 RQ 2: How Do Personal, Social, Environmental, and Technological Conversion Factors Influence The Effective Use Of E-Learning?

The personal conversion factors which influenced the effective use of e-learning by South African HE students were concentration span; procrastination; autonomy or behavioural control; mental health; motivation; and physical health. Home versus learning responsibilities; social presence and interaction; student politics; peer support; corruption; and economic status were the social conversion factors which influenced the effective use of e-learning. For environmental conversion factors, electricity; learning environment; ICT infrastructure; organisational support; and weather were the environmental conversion factors presented. Finally, for technological factors, the influence of course content; e-learning course administration; course design; usability; system quality; system design; technical support; and experience with e-learning systems were depicted.

7.1.3 RQ 3: How Is The Effective Use Of E-Learning By South African HE Students Hindered And Enabled?

The effective use of e-learning by South African HE students is hindered by the following classifications of factors: infrastructural, institutional, individual, and societal challenges. The challenges identified under the infrastructural hindering factors category were internet connectivity and bandwidth issues; electronic device issues; electricity outages; and an unconducive home environment. The attitude and tone of lecturers and limited system training were identified as institutional hindering factors. Procrastination was the only individual hindering factor identified. Finally, the lack of access to resources and corruption were findings depicted as societal hindering factors, while, from an enabling factors perspective, internet connectivity; a conducive home environment; electronic devices; and system quality were depicted under findings of infrastructural enabling factors. The enablers identified under the institutional enabling factors category were supported by HEI and course content. Student autonomy and motivation were depicted as themes identified under the individual enabling findings. Finally, the only enabling factor identified under the societal enabling factors category was financial means.

7.2 THEORETICAL AND PRACTICAL CONTRIBUTION

This study envisaged the following theoretical and practical contributions:

7.2.1 THEORETICAL CONTRIBUTIONS

Firstly, this study contributes towards the body of literature and adds value to understanding the various factors that enable and impede the effective use of e-learning for academic continuity,

where traditional face-to-face classroom learning is not possible due to an emergency or unforeseen circumstances such as a pandemic. In addition, it provides insights into these factors specifically within the context of South Africa, which the existing body of literature does not adequately address. Moreover, this study contributes towards literature that extends beyond the mere acceptance and usage of e-learning in a functional sense but rather provides insights into the effective use thereof, which highlights the type of usage that helps (not necessarily guarantees) students in realising the benefits of e-learning.

Secondly, the overarching goal of this study was to conceptualise a digital capability framework for academic continuity amongst South African HE students. This framework offers a comprehensive consolidation of factors enabling and hindering effective e-learning; indicates how personal, social, environmental, and technological factors influence e-learning use and students' ability to convert e-learning into opportunities or capabilities; and provides a guide on how e-learning can be used effectively for academic continuity amongst South African HE students.

Finally, as part of an original and unique contribution to Information Systems theory, the conceptual research framework presented in the preceding sections extends Sen's Capability Approach's personal, social and environmental factors by introducing a fourth category extracted from the SLR findings. This additional category is referred to as "technological conversion factors" and consists of sub-concepts which are specific to the information technology artefact itself, which in this case is e-learning, bringing a new and exciting contribution to the theory itself.

7.1.2 CONTRIBUTIONS TO PRACTICE

This study provides practical insights into the adoption and use of e-learning, understanding how South African HE students transitioned from traditional face-to-face classroom learning to e-learning which can be valuable to the South African government or specifically the Department of Higher Education and Training that enforced the closure of HEIs under the Disaster Management Act 57 of 2002. This can assist the department of education and other policymakers in assessing the impact and overall success or failure of this transition and the key factors can be used as input into the process of educational and e-learning strategy formulation at a national or district level.

In addition, the framework can also be valuable to HEIs who are considering transitioning to e-learning, as it will provide them with an overview of the potential factors which can enable and hinder the use thereof and the subsequent effect on students' capabilities. HEIs equipped with this knowledge can aid in the formulation and/or evaluation of e-learning implementation, project plans, policies, and training strategies as well as monitoring and reporting processes. The

framework can also provide insight and retrospection to students and lecturers who are currently struggling with e-learning. Understanding the various conversion factors could assist them in making sense of why they are struggling or in the case of the contrary, why they are thriving; and overall, how they can use e-learning effectively to realise the benefits thereof.

Additionally, the framework can be useful to vendors, designers, and developers of e-learning systems as it can be used as input and guideline in the development process of an e-learning system, for instance, using the conversion factors as a checklist of key components, especially in the context of South Africa.

Additional recommendations are as follows:

- While the concept of learning tends to be considered from the lecture or class perspective, these findings have demonstrated that it is only one element of the learning process. HEIs need to consider several other categories of content when switching to e-learning. Furthermore, the integrity of the content types needs to be maintained, for instance, the security and validity of tests and assignments need to be maintained online.
- Student autonomy has been noted as an enabling factor as well as one of the personal conversion factors which influence students' ability to use e-learning effectively. Thus, HEIs need to consider accommodating different learning types for diverse students by making provision for course material that caters for customised learning.
- E-learning systems should be configured in a manner that increases social presence and levels of interactions to keep students engaged. Thus, HEIs need to ensure that collaborative features such as group chats or impromptu pop-up tests are incorporated into the e-learning systems.
- The need for adequate system support and training has been emphasised. Thus, system support and training services need to be considered not only at an HEIs level but also by IT support, designers and developers of such systems to ensure that students can obtain assistance when required without much hassle.
- Government, HEIs and possibly telecommunication companies need to work on strategies for improving ICT infrastructure in all parts of South Africa as well as ensuring that students have sufficient electricity and internet to perform their learning duties, as it is not a luxury but a means to academic continuity. Furthermore, designers and developers of e-learning systems need to factor in these limitations to make the content more accessible amidst these issues.

- Health limitations can be detrimental to the learning experience, this is specifically true when considering the nature and the effects of the COVID-19 virus on health. Thus, both the department of health and education need to consider such stimuli to formulate strategies to optimally support students experiencing health issues, especially under unprecedented circumstances.
- The concept of e-learning should be socialised to family members in a manner which allows them to comprehend and hopefully accommodate the learning demands of students to avoid conflicts between home responsibilities versus academic responsibilities.
- The design, layout and output of such course content need to be carefully considered by lecturers and course conveners to ensure that students can work through the content without much difficulty.
- Designers and developers of e-learning systems need to consider the aspect of usability when configuring e-learning systems to ensure that they are user-friendly to encourage effective use.
- HEIs need to consider the volumes of usage when factoring in e-learning transitions from limited usage to extensive usage to avoid issues with system capacity and performance.

7.3 LIMITATIONS OF THE STUDY

This study is not without its limitations. Firstly, this study is limited in its scope, only 12 participants were interviewed for this study from six different HEIs in three different cities within South Africa, namely, Tshwane University of Technology, University of Pretoria, Rosebank College in Pretoria, University of Witwatersrand, University of Johannesburg in Johannesburg; and Stellenbosch University in Stellenbosch. Thus, the findings may not apply to HE students from other HEIs and/or in other cities. In addition, the majority of the participants were between the ages of 18 to 25, the generational category which Turner (2015) refers to as Generation Z or Gen Z, which consists of individuals who were born between the years 1993 and 2005. One of the key characteristics of this generational category is the notion that they have the highest degree of digital literacy as they have not lived in an era without the internet (Turner, 2015). This notion could have an impact on the findings of this study, students could be presumed to be more comfortable with e-learning; however, caution is advised when reviewing this notion as it may not necessarily hold for the South African Generation Z or in the context of this study where e-learning is the only method of learning available. Consistently, 75% of participants noted to be in the two youngest categories (18-20 and 21-25), were all enrolled in full-time undergraduate programmes.

This may also influence the findings of this study as those who are enrolled full-time may be required to have more frequent participation and interaction with their learning through whichever mode, than the 25% of postgraduate participants who are enrolled on more of a part-time basis.

Finally, this study applied a qualitative approach to data collection and subsequent analysis which means that the findings may not be generalised due to the small sample size; even though small sample size errors were avoided through purposive and snowball sampling techniques to interview participants from diverse backgrounds.

7.4 RECOMMENDATIONS FOR FUTURE RESEARCH

In order to have a confirmatory study which will provide statistically significant and supported results that can be generalised, future research may be conducted on the framework using a survey representing the factors influencing effective use. Furthermore, although this current study was focused on students, future research may be conducted to investigate the effective use of e-learning from the perspective of other key stakeholders in the e-learning environment which Ozkan and Koseler (2009) outlined as students, faculty, employers, administrators, and technical staff. Additionally, the framework can be employed in different contexts such as during a global pandemic, a war or a natural disaster to assess whether the same factors would arise as well as to assist in identifying any new ones. The framework can also be applied to understand which factors are not well-researched and need to be further understood. Additionally, the diverse nature of factors provides a multifaceted view for studying them because they not only encompass personal factors but also social and environmental factors. Thus, the factors can also be studied as a combination or in isolation, i.e. research only focusing on the influence of social factors hindering or enabling students to generate capabilities from e-learning. Finally, the identified associations between the factors can also be studied to establish influencing effects.

REFERENCES

Abbad, M. M. M. (2021). Using the UTAUT model to understand students' usage of e-learning systems in developing countries. *Education and Information Technologies*, *26*(6), 7205–7224. https://doi.org/10.1007/s10639-021-10573-5

Abdellatief. (2011). A Technique for Quality Evaluation of E-Learning from Developers Perspective. American Journal of Economics and Business Administration, 3(1), 157–164. https://doi.org/10.3844/ajebasp.2011.157.164

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. https://doi.org/10.37256/ser.212021422

Adewale, T. O., & Daramola, C. F. (2013). E-Learning in Obafemi Awolowo University, Ile-Ife, Nigeria Distance Learning Centre: An Evaluation of Opportunities and Challenges. Proceedings of the International Conference on E-Learning, 17–23.

Adnan, M., & Anwar, K. (2020). Online Learning amid the COVID-19 Pandemic: Students' Perspectives. Online Submission, 2(1), 45–51

Ain, N., Kaur, K., & Waheed, M. (2016). The influence of learning value on learning management system use: An extension of UTAUT2. *Information Development*, *32*(5), 1306–1321. https://doi.org/10.1177/0266666915597546

Al-Azawei, A., Parslow, P., & Lundqvist, K. (2016). Barriers and Opportunities of e-Learning Implementation in Iraq: A Case of Public Universities. International Review of Research in Open and Distributed Learning, 17(5), 126–146.

Al-Gahtani, S. S. (2016). Empirical investigation of e-learning acceptance and assimilation: A structural equation model. Applied Computing and Informatics, 12(1), 27–50. https://doi.org/10.1016/j.aci.2014.09.001

Aldholay, A. H., Isaac, O., Abdullah, Z., & Ramayah, T. (2018). The role of transformational leadership as a mediating variable in DeLone and McLean information system success model: The context of online learning usage in Yemen. *Telematics and Informatics*, *35*(5), 1421–1437. https://doi.org/10.1016/j.tele.2018.03.012

Ali, M., Raza, S. A., Qazi, W., & Puah, C.-H. (2018). Assessing e-learning system in higher education institutes: Evidence from structural equation modelling. *Interactive Technology and Smart Education*, *15*(1), 59–78. https://doi.org/10.1108/ITSE-02-2017-0012

Alkire, S. (2002). Valuing Freedom: Sen's Capability Approach and Poverty Reduction, Oxford University Press, Oxford.

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. Education and Information Technologies, 1–20. https://doi.org/10.1007/s10639-020-10219-y

Almaiah, M. A., & Alyoussef, I. Y. (2019). Analysis of the Effect of Course Design, Course Content Support, Course Assessment and Instructor Characteristics on the Actual Use of E-Learning System. *IEEE Access*, *7*, 171907–171922. https://doi.org/10.1109/ACCESS.2019.2956349

Almrashdah, I. A., Sahari, N., Mat Zin, N. A. Hj., & Alsmadi, M. (2010). Distance learners acceptance of learning management system. 2010 6th International Conference on Advanced Information Management and Service (IMS), 304–309.

Alshammari, S. H. (2020). The Influence of Technical Support, Perceived Self-Efficacy, and Instructional Design on Students' Use of Learning Management Systems. Turkish Online Journal of Distance Education (TOJDE), 21(3), 112–139. https://doi.org/10.17718/tojde.762034

Alshehri, A., J Rutter, M., & Smith, S. (2020). The Effects of UTAUT and Usability Qualities on Students' Use of Learning Management Systems in Saudi Tertiary Education. *Journal of Information Technology Education: Research*, *19*, 891–930. https://doi.org/10.28945/4659

Alshehri, A., Rutter, M. J., & Smith, S. (2019). An Implementation of the UTAUT Model for Understanding Students' Perceptions of Learning Management Systems: A Study Within Tertiary Institutions in Saudi Arabia. *International Journal of Distance Education Technologies (IJDET)*, *17*(3), 1–24. https://doi.org/10.4018/IJDET.2019070101

Ameen, N., Willis, R., & Abdullah, M. (2016). AN INVESTIGATION OF THE ADOPTION OF EDUCATIONAL TECHNOLOGY IN IRAQI HIGHER EDUCATION: EVIDENCE FROM SALAHADDIN UNIVERSITY (10). UK Academy for Information Systems Conference Proceedings 2016. https://aisel.aisnet.org/ukais2016/

Amin, Md. K., & Zaman, M. (2021). Assessing the Adoption Behavior of E-Learning in a Developing Country in South East Asia: Predicting an Alternative Path to Behavioral Intention to Use. *International Journal of Education & Development Using Information & Communication Technology*, *17*(3), 38–56.

Andersson, A. (2008). Seven major challenges for e-learning in developing countries: Case study eBIT, Sri Lanka. International Journal of Education & Development Using Information & Communication Technology, 4(3), 45–62.

Ansong, E., Boateng, S. L., Boateng, R., & Effah, J. (2016). Determinants of E-Learning Adoption in Universities: Evidence from a Developing Country. 2016 49th Hawaii International Conference on System Sciences (HICSS), 21–30. https://doi.org/10.1109/HICSS.2016.12

Arbaugh, J. B. (2002). Managing the on-line classroom: A study of technological and behavioral characteristics of web-based MBA courses. The Journal of High Technology Management Research, 13(2), 203–223.

Awuzie, B., & McDermott, P. (2017). An abductive approach to qualitative built environment research: A viable system methodological exposé. Qualitative Research Journal, 17(4), 356–372. https://doi.org/10.1108/QRJ-08-2016-0048

Ayodele, S., Endozo, A., & Ogbari, M. E. (2018). A study on factors hindering online learning acceptance in developing countries. Proceedings of the 10th International Conference on Education Technology and Computers, 254–258. https://doi.org/10.1145/3290511.3290533

Barclay, C., & Osei-Bryson, K.-M. (2012). An Analysis of Students' Perceptions and Attitudes to Online Learning Use in Higher Education in Jamaica: An Extension of TAM. GlobDev 2012. https://aisel.aisnet.org/globdev2012/4

Basahel, S., & Basahel, A. (2018). An empirical study of challenges in online distance education in Saudi Arabia. International Journal of Information Technology, 10(3), 289–302. https://doi.org/10.1007/s41870-018-0118-z

Bhattacherjee, A. (2012). Social Science Research: Principles, Methods, and Practices. Textbooks Collection. Book 3. http://scholarcommons.usf.edu/oa_textbooks/3

Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. Computers & Education, 58(2), 843–855. https://doi.org/10.1016/j.compedu.2011.10.010

Bishnoi, M. M., & Suraj, S. (2020). Challenges and Implications of Technological Transitions: The Case of Online Examinations in India. 2020 IEEE 15th International Conference on Industrial and Information Systems (ICIIS), 540–545. https://doi.org/10.1109/ICIIS51140.2020.9342655

Binyamin, S., Rutter, M., & Smith, S. (2017). Factors Influencing the Students' Use of Learning Management Systems: A Case Study of King Abdulaziz University. *International Conference on E-Learning*, 289–297. https://www.proquest.com/docview/1967314428/abstract/77E73A5FF7914485PQ/1

Boddy, C. R. (2016). Sample size for qualitative research. *Qualitative Market Research: An International Journal, 19*(4), 426–432. https://doi.org/10.1108/QMR-06-2016-0053

Braun, V. & Clarke, V. (2012) Thematic analysis. In Cooper, H. (Ed.), The Handbook of Research Methods in Psychology. Washington, DC: American Psychological Association.

Buabeng-Andoh, C., & Baah, C. (2019). Investigating the Actual usage of Learning Management System: From Perspectives of University Students. *2019 International Conference on Computing, Computational Modelling and Applications (ICCMA)*, 1–17. https://doi.org/10.1109/ICCMA.2019.00008

Burton-Jones, A., & Grange, C. (2013). From Use to Effective Use: A Representation Theory Perspective. Information Systems Research, 24(3), 632–658. https://doi.org/10.1287/isre.1120.0444

Burton-Jones, A., & Volkoff, O. (2017). How can we develop contextualized theories of effective use? A demonstration in the context of community-care electronic health records. Information Systems Research, 28(3), 468–489

Canedo, E. D., Santos, G. A., & Leite, L. L. (2018). An Assessment of the Teaching-Learning Methodologies Used in the Introductory Programming Courses at a Brazilian University. Informatics in Education, 17(1), 45–59.

Cantoni, L.M. (2004). World Conference on Educational Multimedia, Hypermedia & Telecommunications, AACE, Norfolk, pp. 50-5.

Castillo-Montoya, M. (2016). Preparing for Interview Research: The Interview Protocol Refinement Framework. The Qualitative Report, 21(5), 811-831. Retrieved from https://nsuworks.nova.edu/tqr/vol21/iss5/2

Charoen, D. (2009). Challenges and Opportunities of eLearning: A Case Study of Higher Education in Thailand. AMCIS 2009 Proceedings, 132.

Chitanana, L., Makaza, D., & Madzima, K. (2008). The current state of e-learning at universities in Zimbabwe: Opportunities and challenges. International Journal of Education & Development Using Information & Communication Technology, 4(2), 5–15.

Chung, E., Subramaniam, G., & Dass, L. C. (2020). Online Learning Readiness among University Students in Malaysia amidst COVID-19. Asian Journal of University Education, 16(2), 46–58.

Cidral, W. A., Oliveira, T., Di Felice, M., & Aparicio, M. (2018). E-learning success determinants: Brazilian empirical study. *Computers & Education*, *122*, 273–290. https://doi.org/10.1016/j.compedu.2017.12.001

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. Management Science, 35(8), 982–1003. https://doi.org/10.1287/mnsc.35.8.982

DeLone, W.H., & McLean, E. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update, *Journal of Management Information Systems*, 19(4): 9-30.

Egielewa, P., Idogho, P. O., Iyalomhe, F. O., & Cirella, G. T. (2021). COVID-19 and digitized education: Analysis of online learning in Nigerian higher education: E-Learning and Digital Media. https://doi.org/10.1177/20427530211022808

Garrison, D. R. (2011). E-Learning in the 21st Century: A Framework for Research and Practice. Taylor & Francis.

Gurban, M. A., & Almogren, A. S. (2022). Students' Actual Use of E-Learning in Higher Education During the COVID-19 Pandemic: *SAGE Open*. https://doi.org/10.1177/21582440221091250

Henaku, E. A. (2020). COVID-19: Online Learning Experience of College Students: The Case of Ghana. 1(2), 10.

Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine, 292*, 114523. https://doi.org/10.1016/j.socscimed.2021.114523

Idris, F. A. A., & Osman, Y. B. (2015). Challanges Facing the Implementation of e-Learning at University of Gezira According to View of Staff Members. 2015 Fifth International Conference on E-Learning (Econf), 336–348. https://doi.org/10.1109/ECONF.2015.51

Kaisara, G., & 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.

Kanwal, F., & Rehman, M. (2017). Factors Affecting E-Learning Adoption in Developing Countries–Empirical Evidence From Pakistan's Higher Education Sector. IEEE Access, 5, 10968–10978. https://doi.org/10.1109/ACCESS.2017.2714379

Karkar, A. J. M., Fatlawi, H. K., & Al-Jobouri, A. A. (2020). Highlighting E-learning Adoption Challenges using data Analysis Techniques: University of Kufa as a Case Study. Electronic Journal of E-Learning, 18(2), 136–149. https://doi.org/10.34190/EJEL.20.18.2.003

Khan, S. H., Hasan, M., & Clement, C. K. (2012). BARRIERS TO THE INTRODUCTION OF ICT INTO EDUCATION IN DEVELOPING COUNTRIES: THE EXAMPLE OF BANGLADESH. International Journal of Instruction, 20.

King, N. (2004a) 'Using interviews in qualitative research', in C. Cassell and G. Symon (eds) Essential Guide to Qualitative Methods in Organizational Research. London: Sage. pp. 11–22.

King, N. (2004b) 'Using templates in the thematic analysis of text', in C. Cassell and G. Symon (eds) Essential Guide to Qualitative Methods in Organizational Research. London: Sage, pp. 256–70.

Koponen, T., Tedre, M., & Vesisenaho, M. (2011). An analysis of the state and prospects of e-learning in developing countries. 2011 IST-Africa Conference Proceedings, 1–9.

Lavrakas, P. J. (2008). Purposive sample. Encyclopedia of Survey Research Methods, 2455.

Mahmud, K., & Gope, K. (2009). Challenges of Implementing E-learning for Higher Education in Least Developed Countries: A Case Study on Bangladesh. 2009 International Conference on Information and Multimedia Technology, 155–159. https://doi.org/10.1109/ICIMT.2009.27

Major, C. (2020). Unprecedented Times and Innovation. *Innovative Higher Education, 45(6),* 435–436. https://doi.org/10.1007/s10755-020-09528-4

Manjeese, C. (2022). Divulging the efficacy of e-learning through the eyes of university students: Lessons from a third world perspective. *Physics and Chemistry of the Earth, Parts A/B/C*, *127*, 103187. https://doi.org/10.1016/j.pce.2022.103187

Miles, M.B. and Huberman, A.M. (1994) Qualitative Data Analysis (2nd edn). Thousand Oaks, CA: Sage.

Moakofhi, M., Leteane, O., Phiri, T., Pholele, T., & Sebalatlheng, P. (2017). Challenges of Introducing E-Learning at Botswana University of Agriculture and Natural Resources: Lecturers' Perspective. International Journal of Education and Development Using Information and Communication Technology, 13(2), 4–20.

Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. Computers in Human Behavior, 45, 359–374. https://doi.org/10.1016/j.chb.2014.07.044

Mohammadi, M. K., Mohibbi, A. A., & Hedayati, M. H. (2021). Investigating the challenges and factors influencing the use of the learning management system during the Covid-19 pandemic in Afghanistan. Education and Information Technologies, 26(5), 5165–5198. https://doi.org/10.1007/s10639-021-10517-z

Mushtaque, I., Rizwan, M., Dasti, R. K., Ahmad, R., & Mushtaq, M. (2021). Students' Attitude and Impact of Online Learning; Role of Teachers and Classmate Support During the Covid-19 Crisis. Performance Improvement, 60(5), 20–27. https://doi.org/10.1002/pfi.21982

Mutisya, D. N., & Makokha, G. L. (2016). Challenges affecting adoption of e-learning in public universities in Kenya. E-Learning and Digital Media, 13(3–4), 140–157. https://doi.org/10.1177/2042753016672902

Narh, N., Boateng, R., Afful-Dadzie, E., & Owusu, A. (2019). Virtual Platforms: Assessing the Challenges of E-Learning In Ghana. AMCIS 2019 Proceedings. https://aisel.aisnet.org/amcis2019/is_education/is_education/21

Nwana, S. (2012). Challenges in the applications of e-learning by secondary school teachers in Anambra State, Nigeria. African Journal of Teacher Education, 2(1).

Oates, B. J. (2006). Researching Information Systems and Computing. Sage: London.

Okoli, C., Schabram, K. (2010). "A Guide to Conducting a Systematic Literature Review of Information Systems Research,". Sprouts: Working Papers on Information Systems, 10(26). http://sprouts.aisnet.org/10-26.

Olasina, G. (2019). Human and social factors affecting the decision of students to accept e-learning. Interactive Learning Environments, 27(3), 363–376. https://doi.org/10.1080/10494820.2018.1474233

Oluyinka, S., & Endozo, A. N. (2005). BARRIERS TO E-LEARNING IN DEVELOPING COUNTRIES: A COMPARATIVE STUDY. . . Vol., 9, 13.

Ozkan, S., & Koseler, R. (2009). Multi-dimensional students' evaluation of e-learning systems in the higher education context: An empirical investigation. Computers & Education, 53(4), 1285–1296.

Patton, M. Q. (2002). Qualitative research and evaluation methods. Thousand Oaks. Cal.: Sage Publications.

Qureshi, I. A., Ilyas, K., Yasmin, R., & Whitty, M. (2012). Challenges of implementing e-learning in a Pakistani university. Knowledge Management & E-Learning; Hong Kong, 4(3), 310.

Raza, S. A., Qazi, W., Khan, K. A., & Salam, J. (2020). Social Isolation and Acceptance of the Learning Management System (LMS) in the time of COVID-19 Pandemic: An Expansion of the UTAUT Model: *Journal of Educational Computing Research*. https://doi.org/10.1177/0735633120960421

Red Cross. (2020). What social distancing means. https://www.redcross.org/about-us/news-and-events/news/2020/coronavirus-what-social-distancing-means.html

Rotas, E. E., & Cahapay, M. B. (2020). Difficulties in Remote Learning: Voices of Philippine University Students in the Wake of COVID-19 Crisis. Asian Journal of Distance Education, 15(2), 147–158.

Rosenberg, M..J. (2001). E-Learning: Strategies for Delivering Knowledge in the Digital Age New York, NY: McGraw-Hill Companies, Inc.

Rosenthal, R. (1994). Science and Ethics in Conducting, Analyzing, and Reporting Psychological Research. Psychological Science, 5(3), 127–134. https://doi.org/10.1111/j.1467-9280.1994.tb00646.x

Saunders, M., Lewis, P. & Thornhill, A. (2009). Research Methods for Business Students. Prentice

Seddon, P. B. (1997). A Respecification and Extension of the DeLone and McLean Model of IS Success. Information Systems Research, 8(3), 240–253. https://doi.org/10.1287/isre.8.3.240

Selvanathan, M., Hussin, N. A. M., & Azazi, N. A. N. (2020). Students learning experiences during COVID-19: Work from home period in Malaysian Higher Learning Institutions: Teaching Public Administration. https://doi.org/10.1177/0144739420977900

Sen, A. (1984). Resources, Values and Development, Oxford: Basil Blackwell.

Sen, A. (1985). Well-being, Agency and Freedom: the Dewey Lectures. Journal of Philosophy, 82(4), 169.2

Sen, A. (1987). The Standard of Living: The Tanner Lectures, Cambridge: Cambridge University Press.

Sen, A. (1992). Inequality Re-examined, Oxford: Clarendon Press.

Sen, A. (1993). Capability and Well-being. in Martha C. Nussbaum and Amartya K. Sen (eds), The Quality of Life, Oxford: Clarendon Press, pp. 30-53

Sen, A. (1999). Development as Freedom, Oxford: Oxford University Press.

Sen, A. (2000). Social exclusion concept, application and scrutiny. Social Development Papers. No. 1, Asia Development Bank, Tokyo

Sung, E., & Mayer, R. E. (2012). Five facets of social presence in online distance education. Computers in Human Behavior, 28(5), 1738–1747. https://doi.org/10.1016/j.chb.2012.04.014

Tan, A.Y.T., Chew, E., Mellor, D., 2016. To infinity and beyond: E-learning in the 21st century, in: 2016 IEEE Conference on E-Learning, e-Management and e-Services (IC3e). Presented at the 2016 IEEE Conference on e-Learning, e-Management and e-Services (IC3e), pp. 156–161. https://doi.org/10.1109/IC3e.2016.8009058

Tarhini, A., Hone, K., & Liu, X. (2013). Extending the TAM model to empirically investigate the students' behavioural intention to use e-learning in developing countries. 2013 Science and Information Conference, 732–737.

Tarus, J. K., Gichoya, D., & Muumbo, A. (2015). Challenges of Implementing E-Learning in Kenya: A Case of Kenyan Public Universities. International Review of Research in Open and Distributed Learning, 16(1), 120–141.

Turner, A. (2015). Generation Z: technology and social interest. The Journal of Individual Psychology, 71(2), 103-113. https://doi.org/10.1353/jip.2015.0021

Twinamasiko, N., Nuwagaba, J., Gwokyalya, A. M., Nakityo, I., Wasswa, E., & Sserunjogi, E. (2021). Drivers Affecting the Acceptance and Use of Electronic Learning Among Ugandan University Students in the COVID-19 Era: A Cross-Sectional Survey Among Three Universities: SAGE Open. https://doi.org/10.1177/21582440211029922

UNESCO (2020). COVID-19 Educational Disruption and Response. https://en.unesco.org/covid19/educationresponse. Retrieved Feb 2020.

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, 46(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 425–478.

Vershitskaya, E. R., Mikhaylova, A. V., Gilmanshina, S. I., Dorozhkin, E. M., & Epaneshnikov, V. V. (2020). Present-day management of universities in Russia: Prospects and challenges of e-learning. Education and Information Technologies, 25(1), 611–621. https://doi.org/10.1007/s10639-019-09978-0

WHO. (2020). Coronavirus disease (COVID-19) pandemic. World Health Organization. https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Yakubu, M. N., & Dasuki, S. I. (2018). Assessing Elearning Systems Success in Nigeria: An Application of the Delone and Mclean Information Systems Success Model. *Journal of Information Technology Education: Research*, *17*, 182–202. https://doi.org/10.28945/4077

Yakubu, M. N., & Dasuki, S. I. (2019). Factors affecting the adoption of e-learning technologies among higher education students in Nigeria: A structural equation modelling approach. *Information Development*, *35*(3), 492–502. https://doi.org/10.1177/0266666918765907

Yakubu, M., & Dasuki, S. (2021). Emergency Online Teaching and Learning in a Nigerian Private University: An Activity Theory Perspective. UK Academy for Information Systems Conference Proceedings 2021. https://aisel.aisnet.org/ukais2021/14

Yin, R.K. (2003) Case Study Research: Design and Methods (3rd edn). Beverly Hills, CA: Sage.

Zalat, M. M., Hamed, M. S., & Bolbol, S. A. (2021). The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff. PLoS ONE, 16(3), 1–12. https://doi.org/10.1371/journal.pone.0248758

8 APPENDIX A: SLR METHODOLOGY

8.1 SLR METHODOLOGY

The systematic review protocols followed in this paper were guided by Okoli and Schabram (2010) who outline the process of producing a research literature review that is systematic, explicit, comprehensive, and reproducible. This section outlines the approach taken.

8.1.1 Factors Influencing The Use of E-Learning by Students in HEIs in Developing Countries

This section depicts the methodology which was followed to produce the review which provides an overview of the evidence on the existing body of knowledge with regard to the factors that influence the use of e-learning by students in HEIs in developing countries.

8.1.1.1 Search Terms

Based on the goal of the study, key phrases and terms were identified to formulate search terms that would be applied. To link different keywords together the “AND” operator was used and to broaden the search to include synonyms and substitutes, the “OR” operator was used. The following search strings were generated:

- “e-learning” **OR** “online learning” **OR** “online education” **OR** “electronic learning”
- **AND**
- “higher education institutions” **OR** “university” **OR** “college”
- **AND**
- “developing countries” **OR** “developing nations” **OR** “third world”
- **AND**
- "use" **OR** "usage" **OR** "using"
- **AND**
- "influencing" **OR** "influence" **OR** "affecting" **OR** "affect" **OR** “impact”

8.1.1.2 Search Resources

The following electronic databases were searched:

- Association for Information Systems (AIS) eLibrary
- Education Resources Information Center (ERIC)
- Journal of Educational Technology Systems (ETS)

- EBSCO (Academic Search Ultimate, Computers & Applied Sciences Complete, Education Research Complete and Teacher Reference Centre)
- IEEE Xplore
- ScienceDirect
- SpringerLink

8.1.1.3 Search Date Range

The search date ranged from 2015 to 2022, anything that fell outside of that range was excluded.

8.1.1.4 Selection Process

After formulating the search strings and confirming the electronic database, the searches were executed and returned 635 results. The selection process followed two main levels of inclusion and exclusion criteria to ensure that the most suitable papers were selected in the end:

The first level involved reviewing the titles and abstracts from the returned results, the exclusion criteria applied to the studies were as follows:

- Studies without mention of e-learning
- e-learning not in higher education intuitions
- e-learning not within the context of developing countries
- Not empirical research
- Other stakeholders (i.e., non-users such as industry experts, e-learning system designers and administrators)
- Studies not in the English language
- Comparative studies
- Studies without full text
- Duplicates
- Short papers
- Discussion papers
- Full text inaccessible due to access restrictions

The second level involved an assessment of the full text of the 38 candidate articles, the exclusion criteria applied after assessing the full text were as follows:

- No actual report on the actual use of e-learning directly

- Specialised e-learning platforms only used for one specific and specialised purpose: tutoring, peer-to-peer, subject and program-specific and management
- E-learning platforms used simultaneously with traditional face-to-face learning in the classroom
- Open-source e-learning platforms
- Solely mobile learning

After the full-text review from the outcome of the second level of assessment which yielded 15 articles, along with an additional 5 articles which were added by hand searching and reference list checking, 20 articles met the inclusion criteria:

- An e-learning system
- Factors influencing actual use directly recorded by the study from the investigation
- In higher education institutions
  In developing countries

8.1.2 Challenges that hinder the success of e-learning in HEIs within the context of developing countries

This section depicts the methodology which was followed to produce the review which provides an overview of the evidence on the existing body of knowledge about the e-learning challenges experienced in higher education in developing countries.

8.1.2.1 Search Terms

Based on the goal of the study, key phrases and terms were identified to formulate search terms that would be applied. To link different keywords together the “AND” operator was used and to broaden the search to include synonyms and substitutes, the “OR” operator was used. The following search strings were generated:

- “e-learning” **OR** “online learning” **OR** “online education” **OR** “electronic learning”
- **AND**
- “issues” **OR** “challenges” **OR** “barriers” **OR** “difficulties”
- **AND**
- “higher education institutions” **OR** “university” **OR** “college”
- **AND**
- “developing countries” **OR** “developing nations” **OR** “third world”

8.1.2.2 Search Date Range

The search date ranged from 2015 to 2022, anything that fell outside of that range was excluded.

8.1.2.3 Search Resources

The following electronic databases were searched:

- Association for Information Systems (AIS) eLibrary
- Education Resources Information Center (ERIC)
- Journal of Educational Technology Systems (ETS)
- EBSCO (Academic Search Ultimate, Computers & Applied Sciences Complete, Education Research Complete and Teacher Reference Centre)
- IEEE Xplore
- ScienceDirect
- SpringerLink

The database selection was informed by endorsements of top educational, ICT and information systems journals.

8.1.2.4 Selection Process

After formulating the search strings and confirming the electronic database, the searches were executed and returned 1 633 results. The selection process followed two main levels of inclusion and exclusion criteria to ensure that the most suitable papers were selected in the end:

The first level involved reviewing the titles and abstracts from the returned results, the exclusion criteria applied to the studies were as follows:

- Studies without mention of e-learning
- e-learning not in higher education intuitions
- e-learning not within the context of developing countries
- Not empirical research
- Other stakeholders (i.e., non-users such as industry experts, e-learning system designers and administrators)
- Studies not in the English language
- Comparative studies
- Studies without full text

- Duplicates
- Short papers
- Discussion papers
- Full text not accessible due to access restrictions

The second level involved an assessment of the full text of the 186 candidate articles, the exclusion criteria applied after assessing the full text were as follows:

- No actual report on challenges or issues or barriers or impediments in the recording of the findings from the investigations or observation
- Specialised e-learning platforms only used for one specific and specialised purpose: tutoring, peer-to-peer, subject and program specific and management
- E-learning platforms used simultaneously with traditional face-to-face learning in the classroom
- Open-source e-learning platforms
- Solely mobile learning

After the full-text review from the outcome of the second level of assessment which yielded 26 articles, along with an additional 4 articles which were added by handsearching and reference list checking, 30 articles met the inclusion criteria of:

- An e-learning system
- Challenges or issues or barriers or impediments recorded by the study from investigation
- In higher education institutions
  In developing countries

9 APPENDIX B: INTERVIEW PROTOCOL

#	Interview Question	Concept from conceptual research framework	Research Objective/Question
1.	How old are you?	*Introductory questions*	
2.	Which higher education institution are you enrolled at?		
3.	Which programme are you studying? What year of study are you busy with?		
4.	What was your primary method of learning before the pandemic?		
5.	What is your opinion on e-learning?		
6	Which e-learning system do you use at your higher education institution?	*Resource/Commodity (e-learning system)*	*Describe use of e-learning by South African HE students* **RQ**: **How do South African HE students use e-learning?**
7	How do you access the e-learning system? Which resources do you use?		
8	When do you use e-learning?		
9.	What kind of information is delivered through the e-learning platforms?		
10.	From which location/setting do you access it? **i.e. at home or res or internet café?*		
11.	What are the factors you believe, enable the effective use of e-learning?	*Conversion factors*	*Describe factors hindering and enabling the effective use of e-learning by South African HE students* **RQ: How is the effective use of e-learning by South African HE students hindered and enabled?**
12.	What are the factors you believe hinder the effective use of e-learning?		
13.	Can you describe how *personal factors influence your ability to use e-learning effectively? ** those linked to the personal characteristics of students such as mental as well as physical state, literacy and gender which affect the nature and extent of capabilities a student can generate from e-learning*	*Personal conversion factors*	*Describe how personal, social, environmental, and technological conversion factors influence effective use of e-learning:* **RQ: How do personal, social, environmental and technological conversion factors influence the effective use of e-learning?**
14.	Can you describe how **social factors influence your ability to use e-learning effectively? *** those linked to characteristics of the social settings which range from (not limited to) social norms such as gender roles, religion and heterodoxy. They also include social institutions such as political rights, public policies and rule of law, and power formation such as hierarchal structure and politics*	*Social conversion factors*	
15.	Can you describe how ***environmental factors influence your ability to use e-learning effectively? ****those characteristics linked to the environment in which the student lives such as climate, infrastructure resources and public goods which are critical in converting resources to the functionings of a student*	*Environmental conversion factors*	
16.	Can you describe how ****technological factors influence your ability to use e-learning effectively? *****those linked to the e-learning system itself which in this case is the e-learning system*	*Technological conversion factors*	

10 APPENDIX C: SAMPLE TRANSCRIPT

Contextual data:

- Face to face at Residence Coffee area
- 27/04/2022
- There were not a lot of people at the residence coffee area so we were able to speak through the interview without many interruptions
- 19 year old
- Female
- TUT

ROM: Okay, so how old are you?

Stu02F: I am 19 turning 20

ROM: 19!! turning 20.. okay that's excellent. So which institution are you enrolled at?

Stu02F: Tshwane University of Technology

ROM: Tshwane University of Technology… Okay, happiness and what year are you studying umm?

Stu02F: it's my second year

ROM: second year, okay. when we thinking of that lockdown situation let's think about in the context of elarning during the pandemic. So just a side note on that

Stu02F: okay

Stu02F: Okay so you say you studying second year, what are you studying?

Stu02F: Diploma in Accounting

ROM: wow girl, you like money *jokes*. Wow, okay that impressive

Stu02F: laughs

ROM: Okay, you want to be a CA?

Stu02F: Yeah, CA

ROM: CA (SA) next to.. here where you signed here, you'll say CA(SA). Okay cool, that's excellent

Stu02F: laughs

ROM: okay cool, okay so before.. you started studying during the pandemic? You never studied before the pandemic?

Stu02F: uhmm, I started like the second year of the pandemic.

ROM: okay cool, so then in the pandemic… so yah, you didn't experience face-to-face learning?

Stu02F: hmmmm I kind of did..

ROM: okay so let's talk about that then. So before the pandemic, what were you.. what was your way of learning?

Stu02F: uhhh **we used to attend in campus, so everyday we'd wake up and go to campus. And things were a bit easier because if like you don't understand, you could just ask the lecturer something.**

ROM: hmmmm, we going to come to that, I love that

Stu02F: laughs

ROM:okay cool, so before the pandemic.. okay so now in the pandemic, what system… elearning system did you guys have to use now? When the pandemic hit and you couldn't do face-to-face classes, what's the name of the elearning system that you guys used?

Stu02F: uhhh, just call it online learning…

ROM: is not Brightspace?

Stu02F: no Brightspace is for like information, that's where you get like uhmm you tests, your articles…

ROM: and then the one where your lectures are happening, what's that called?

Stu02F: **it's just Teams, we just used Microsoft Teams**

ROM: Microsoft Teams..

Stu02F: yes

ROM: let me just make a note.. teams, okay **AND THEN HOW DO YOU ACCESS IT? SO WHAT DO YOU NEED TO BE ABLE TO USE IT?**

Stu02F: okay so, you have to go onto Brightspace.. the lecturer will post a link. So you just access Brightspace and you click on the link and then it will go straight to teams..

ROM: okay but then what are you using to do that?

Stu02F: what am I using?

ROM: like resources..

Stu02F: ohhh so basically, I used my **phone** *laughs*

ROM: ahh so you not scared hay*jokes* okay so phone, okay…

Stu02F: Cause I feel like it's a bit uhm complicated to use a laptop

ROM: okay so you prefer the phone over the laptop.. okay then phone, laptop.. is there anything else you needed to use it?

Stu02F: is there what?

ROM: is there anything else you needed to get into.. is it just your phone?

Stu02F: yeah, it's just my phone. It was just my phone

ROM: hmm and then uhmm **WHEN DO YOU USUALLY… WHEN DO YOU DO IT? ONLINE LEARNING…? IS IT IN THE AFTERNOON, IN THE MORNING OR IS IT…?**

Stu02F: uhhnn okay it depends on the timetable, **sometimes its in the morning and sometimes we don't have classes at all and sometimes it could be between 12 and 2**

ROM: okay so driven by the timetable pretty much?

Stu02F: yes

ROM: did you always have classes because you accounting so there's no way you didn't start in the morning and finish at night because you are… *jokes*

Stu02F:*Laughs* but it's not that bad, I never have like classes that are like from 3 to 5. It's always in the morning until 2

ROM: I don't remember that about accounting students, there were always just 8 o'clock, they'd have an 8 o'clock *jokes*

Stu02F: classes yeah

ROM: yeah, okay so what type of information.. okay so hear me out, the types of so so. **WHAT TYPE OF INFORMATION ARE YOU SEEING IN THIS SPACE, THIS PORTAL THAT YOU USING?** So is it like recorded lectures? It is lectures happening at the same time? Is it slides? What is it exactly that you are accessing?

Stu02F:uhmm okay honestly from my side I think I.. most of the time I'd just access the recorded lectures *laughs* sometimes I can't wake up so

ROM: lectures but there are…?

Stu02F: But there are some that I'd wake up and attend but I'd still redo them just for better understanding

ROM: Real-time lectures. Okay what else do you.. what other material?

Stu02F: uhhh for?

ROM: for the learning, for the learning process are you accessing either through Brightspace or teams

Stu02F: uhh other material..

ROM: what other information are they giving you guys?

Stu02F: uhhh it's just **updates on tests**, okay they tell us that you guys are going to write on chapter this and this at this time and then the code to access the test, this is the code. That's the information that they post. And if classes are cancelled, that's through Brightspace uhmm

ROM: okay, **class information**, okay

Stu02F: And also you could get your **recorded lectures**, yeah

ROM: okay and you guys didn't get any slides or stuff like that?

Stu02F: no, we **do get slides**, we also get slides on Brightspace. Slides are posted

ROM: okay, alright, that's good. Umm and then **WHERE DO YOU USUALLY ACCESS THIS LEARNING FROM? I**s it from.. do you go to campus and sit somewhere there? Internet café? Your room? Where?

Stu02F: uhn no, mostly I just.. I am always in my room cause the wifi connects.. okay sometimes.. and then if not then we just go to the **multipurpose,** the wifi is good there. Sometimes that's where people prefer to be

ROM: is the multipurpose like a study area?

Stu02F: well not really, we do have like a study area but we don't use it because it.. I think it's because of the wifi. So the multipurpose is like a …

ROM: .. a centre?

Stu02F: yah, the wifi connects perfectly there. So when you write assignments, if you want you just go there.

ROM: okay, that's quite interesting.. okay, and then , okay if you were to give me an opinion.. like just .. a summarized opinion, your opinion on e-learning.. what is your opinion?

Stu02F: okay so it has **both its advantages and disadvantages**.. umm it's convenient for me because I know if I missed a class or something, I know I can always go back and if I don't understand something I can rewrite my question and ask the lecturer on the next lesson. But it's also a disadvantage because sometimes people disrupt the class maybe due to different problems, some can't see the screen, some are experiencing load shedding..

ROM: hmmmmmmm

Stu02F: *laughs* and then it's just a mess, so that the disadvantage.

ROM: okay… so I'm just making a.. sorry, the thing is that you making good points

Stu02F:*giggles

ROM: okay that's cool so, alright so we going to dive into hectic things now but it's fine, you've got this. You doing very well so thank you.

Okay so when you thinking about.. okay so obviously there is e-learning right and then there is also just.. you've come here for a reason right, you've come here to pass. **SO WHAT DO YOU THINK.. WHAT FACTORS DO YOU THINK WILL LIKE ENABLE YOU TO THEN TO LEARN EFFECTIVELY.** So like you learning effectively means that.. you can learn but it might not be effective and it might not achieve what you wanted so what are the type of things that you believe you need to learn effectively

Stu02F: Okay so for me um I prefer working alone and if I don't understand something then I just write it down and then I just.. we do have people that are really smart so I just go to them and ask..

ROM: oh so like consulting…?

Stu02F: consulting with other people yes, for better understanding and then you know what if you do that then I'm improving on this and I will be able to do it.

ROM: okay, so consulting.. is there anything else that you think you need to learn effectively?

Stu02F: hmmmm okay also more like tutors, cause its only the lecturers and sometimes you know you not really comfortable with asking them questions so at least if you have a tutor then it's like okay guys do you understand..

ROM: okay so tutoring, tutoring.. okay, cool .anything else?

Stu02F: uhmm no, it's just those two

ROM: excellent, it's very interesting. What I am noticing it that you love.. what I am noticing is that you know there are people that cram..?

Stu02F: oh yah yea

ROM: and then people that want to understand, you sound like someone that wants to understand

Stu02F: yes, to understand because you don't know if you will need that information in future

ROM: that's… I commend you; I wasn't that type of student so well done.

Stu02F:*giggles*

ROM: So now, remember I was asking you about factors that enable? Now lets talk about the negative part of those so..

Stu02F: okay…

ROM: so **WHAT FACTORS DO YOU BELIEVE HINDER OR AFFECT LIKE IN A NEGATIVE WAY**, hinder, make it like hard for you to um um learn effectively

Stu02F: okay so uhh sometimes the lectures contribute to the.. the lecturers, most of them are impatient, it's that thing.. sometimes you want to ask a question but they'll be like "ah no I already explained this, what don't you understand!" and it now like you forced to just be like "okay fine, I understand" without understanding properly because of their impatience and everything

ROM: hmmmm hmmm

Stu02F: uhhhhm and also and also the fact that sometimes I do really procrastinate. I just be like "okay no I'll just watch the recordings later" and then now they all packed up and then I have to work under pressure then now it's like okay, can't get everything so just have to do umm 50% of the work, work on 50%. It affects our ability to do good *giggles*

ROM: the thing is you'll always end up like you trying to catch up right?

Stu02F: hmmmm catching up hmmm

ROM: and it takes three for you to fall apart right aish

Stu02F: honestly..

ROM: okay then lecturers' attitude kind of like vibe and procrastination. Anything else?

Stu02F: uhmmm, what else… okay I did mention the **network problem, because also the area we are in is just really..** so sometimes you just like "ag nah, I'm not about to" because you..

ROM: hmmm okay, anything else before I move on?

Stu02F: uh-uh(no)

ROM: Alright, shap. So the question I am going to ask are driven.. some of them you have already.. so you can repeat. So jut a heads up on that.

Stu02F: okay

ROM: So I am going now ask you about personal factors, so like think about yourself.. your holistic view so think about.. So can you describe how personal factors influence your ability to use e-learning effectively? I am going to give you examples: such as mental health, physical state, habits, literacy and gender.

Stu02F: uhmm I don't think any of it affected me. Like I never… hmmm let me…

ROM: You just said procrastination…

Stu02F: No but like it's just procrastination but in terms of the mental health and .. no

ROM: but what is procrastination… is not coming from you? It's a personal attitude

Stu02F: It's a personal attitude neh but that's the only

ROM: discipline? I don't know, it's up to you, you can say if you think it's a thing… If you think.. if you think it can fall under you

Stu02F: oh yeah, procrastination, it does fall under me cause its not only the school work that I procrastinate with.. it's just a lot of things also. So yeah I think it's just procrastination, maybe that's just something that I just noticed. yeah

ROM: hmmm… uhmmm and guess what? You can still change it * jokes*

Stu02F: Laughs

ROM: This is coming from one of the biggest procrastinators by the way because I get a bad adrenaline rush when I do things last minute so I enjoy that chaos…

Stu02F: Oh you enjoy…!

ROM: So don't take… learn from others' mistakes.. be a better person than me*jokes

---

So I spoke about personal factors, can we go into social factors now. SO can you describe how social factors influenced your ability to use e-learning effectively? I am going to give you examples, so the social setting that you are in. Societal factors for instance, gender roles, religion, culture, it can also be social institutions such that represent political rights…

Stu02F: okay uhmmm

ROM: …… **THERE'S A LOT OF THINGS I DIDN'T TRANSCRIBE WHEN ASKING THIS QUESTION BECAUSE THERE WAS A LOT OF BACK AND FORTH IN UNDERSTANDING THE QUESTION**

Stu02F: But also, I think the political could also uhmmm… these… what are they called…? These ANC, EFF…

ROM: what? They like to strike?

Stu02F: yes, every little thing they just want to strike. If they feel like uhmm they don't want to do sit ins because online… when they writing online its easier to cheat and everything. They.. sometimes it's not always like for the right reasons… I think that's just it

ROM: hmmm, that's a good point cause.. that's good. I can't believe you 19, you very smart.. it's very scary *jokes

Stu02F: laughs

ROM: okay, so we spoke about social factors, now let's talk about environmental.. and just hear me out, I spoke about social landscape now I am going to speak about environmental. Can you describe how environmental factors influenced your ability to use e-learning effectively? So these are characteristics blah blah blae-explaining

Stu02F: Okay for that, uhmmm I just think everything was fine.. okay, let me just speak based on where I live: we never really have an issue with a lot of things, it's just always **just the network – that's the major thing**. Uhmm water, power… when you say power are you like…?

ROM: Electricity…

Stu02F: oh yah! We have a **generator**

ROM: oh boujie *jokes

Stu02F: laughs* so that's just like the advantage you see, now you don't have an excuse to say "oh no you couldn't study" cause you have a generator.

ROM: okay, that's interesting, you boujie *jokes*

Stu02F: Laughs

ROM: Okay fine… and then for the last part, we talk about the system that you use to learn... so its based on that. Can you describe how uhmm whether its Microsoft/Brightspace influences your ability to learn effectively? Its its.. it can be the design, it can be the formatting, it can be.. whatever linked to it..

Stu02F: okay so basically, number one: **it's easy to access**, its straightforward. As soon as you log onto to Brightspace, you just get your modules. They'll be like "if you want to access financial accounting, you can do that.. if you want to access auditing".. so that's where you find information for each module, its under it's own category so its not complicated.

Uhmm also with.. and also with the student email, where if they are like.. they send you.. **if you don't want to access your things via Brightspace** you can just go into your student email, under your student email that's where you get "this is the recording for the lecture on this specific date" so if you remember that on the 27 of April we did this, you can go to your student email and search the date..

ROM: yah search…

Stu02F: hmmm, what else…? Oh and yah it's easy to use and if you have a question, you don't have to struggle with asking the class rep for the lecturer's email or something, **it's written at the bottom of each Module**.. that's like yah.. so you can just contact them..

ROM: okay.. cool.. Okay so last question *yay we made it* so this question … contextualizing question

Stu02F: Okay so from our side, since that we have never done this online thing… Like it was just a big change for us uhh there was like uhmm like an **introduction**, like okay this is how everything is going to happen so like it was sort of like a tutorial on how to access everything, how to use everything. There was also a point where **they were testing if we could access it** . There were also quizzes that were given to us, just to test the effectiveness of the of the whole thing and they were just like "okay fine"… it wasn't like a test.. it was like checking if everyone is able to get a hang of it. Uhmm yah so that made it a lot easier cause they were **also like videos**.. you know sometimes people just are like "just do ths and do that" but this time what was different was that somebody was showing you'll, also them accessing it and you know that "okay fine, this is where I am supposed to go and this is where I am supposed to do things" and also if you can't, you know that you could just ask someone next to you or you could just contact them also.. so it was not really difficult, it was made easier.

ROM: so you believe that's the best way to approach

Stu02F: I think that's the best way to go.. to approach it… hmm what else…? Uhmmm. Can you also repeat the question again?

ROM: repeats question

Stu02F: with that, **I feel 50 % online, 50% contact** because we don't know what's going to happen in future so at least if even the ones that are from high school get a hold of the online learning, you know that it made much easier. So if we just focus on continuing with it.. not 100% because.. that would make a difference cause I noticed most of the universities were just used to "sit in"/contact so its hard to adjust not like UNISA students, they used to it so yah, that would be effective…

ROM: anything else?

Stu02F: nahhh.

11 APPENDIX D: ETHICS CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

SCHOOL OF BUSINESS SCIENCES ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: CBUSE1965**
PROJECT TITLE	A Digital Capability Framework for Academic Continuity amongst South African Higher Education Students
INVESTIGATOR	Reitumetse Makgopela
SCHOOL/DEPARTMENT OF INVESTIGATOR	School of Business Sciences
DATE CONSIDERED	24 November 2021
DECISION OF THE COMMITTEE	Approved Unconditionally
RISK LEVEL	Minimal Risk
EXPIRY DATE	31 December 2023

ISSUE DATE OF CERTIFICATE 06 December 2021 **CHAIRPERSON** _____
(Neetu Ramsaroop)

cc: Supervisor: Dr Thembekile Mayayise

12 APPENDIX E: INFORMATION PARTICIPATION LETTER



WITS
UNIVERSITY

Dear Sir / Madam,

My name is Reitumetse Makgopela and I am a Master of Commerce student in Information Systems at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project, and I am investigating factors influencing effective e-learning for academic continuity amongst South African Higher Education students under the supervision of Dr Thembekile Mayayise. The aim of this research project is to conceptualise a digital capability framework for academic continuity amongst South African Higher Education students.

As part of this project, I would like to invite you to take part in an interview. This interview will take place face-to-face or via web conference, and will take around 30 to 40 minutes. With your permission, I would also like to record the audio of the interview. This recording will be stored in a secured and protected location and only the researcher will have access to this recording. It will be deleted after three years.

There will be no personal costs to you if you participate in this project. You will not receive any direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The interview will be completely confidential and anonymous as I will not be asking for your name or any identifying information, and the information you give to me will be held securely and not disclosed to anyone else. I will be using a pseudonym (false name) to represent your participation in my final research report. If you experience any distress or discomfort at any point in this process, we will stop the interview or resume at another time.

If you have any questions during or afterwards about this research, feel free to contact me at the details listed below. If you wish to receive a summary of this report, I will be happy to send it to you. If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), Tel +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za

Yours sincerely,
Researcher:
Reitumetse Makgopela, 1762358@students.wits.ac.za, +27 (0) 82 062 7280

Supervisor:
Dr Thembekile Mayayise, thembekile.mayayise@wits.ac.za

13 APPENDIX F: CONSENT FORM

A Digital Capability Framework for Academic Continuity amongst South African Higher Education Students

Reitumetse Makgopela

I, …….., agree to participate in this research project. The research has been explained to me and I understand what my participation will involve. I agree to the following:

(Please circle the relevant options below).

I agree that my participation will remain anonymous	YES	NO
I agree that the researcher may use anonymous quotes in his / her research report	YES	NO
I agree that the interview may be audio recorded	YES	NO
I agree that the information I provide may be used in an anonymized format after this project has ended, for academic purposes by other researchers, subject to their own ethics clearance being obtained.	YES	NO

…… (signature)
…… (name of participant)
…… (date)

14 APPENDIX G: TURNITIN REPORT

Attached as a separate document.