



**Examining Lecturers' Use of ICT in an Introductory Economics
Course During the Covid-19 Pandemic**

A Research Paper Submitted By:

Name: Juanita Renée Pratt

Student number: 0719753v

Student Email: 0719753v@students.wits.ac.za

Ethics Clearance Number: H20/02/36

Supervisor:

Ms. Fatima Makda

University of the Witwatersrand

Faculty of Humanities

School of Education

September 2024

Abstract

This study investigated how lecturers in the economics department at an urban university in South Africa used information communication technology to teach an introductory economics course during the Covid-19 pandemic. Many lecturers who teach introductory economics do not integrate ICT in their teaching and this can impact the quality of teaching and learning. It has become more critical to examine this challenge because most higher education institutions now integrate some form of online learning and teaching in their courses. Therefore, it is important to examine lecturers' response to online teaching during emergency remote teaching in order to learn from their experience and identify the competencies needed to teach introductory economics.

The purpose of the study was to examine lecturers' use of ICT in an introductory economics course and to consider the competencies that support teaching with ICT in the subject. The main research question was *How do lecturers use ICT to teach introductory economics during the Covid-19 pandemic?* To better understand lecturers' ICT practices, this qualitative study adopted an interpretivist approach and used content analysis to examine participant interviews and learning materials embedded in the learning management system for the introductory economics course. In addition to content analysis, the data were analysed and interpreted through the theoretical framework of the Teacher Response Model and Teaching Quality Framework.

Several themes emerged about the nature of economics lecturers' pedagogy namely: (a) they adapted their teaching practice by deploying all assessments through the learning management system and developing video lectures for students to download; (b) they developed new practices to encourage formative assessment and they acquired technical skills to manage the transition to emergency remote teaching; and (c) they used existing technologies in new ways to manage the change in teaching mode.

Despite their inexperience with online teaching, lecturers were motivated to integrate ICT into their economics teaching practice in order to (d) maintain the continuity of the course and to ensure academic standards were upheld. Furthermore, they (e) acknowledged the fact that the majority of economics students had limited resources and they accommodated for this inequity by responding to students' academic, social and emotional needs.

Although many lecturers lacked the experience of teaching online, they displayed flexibility, innovation and commitment to the academic project by utilising ICT to facilitate learning and teaching to the best of their ability during the challenging conditions of emergency remote teaching.

Keywords

ICT integration; Emergency remote teaching; Covid-19 pandemic; Economics education; Institutions of higher education

Candidate declaration

Declaration

I declare that this research report is my own unaided work. It is being submitted for the degree of Master of Education at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other university.

Name of candidate: Juanita Pratt

Student number: 0719753v

Signature: JR Pratt

Date: 29 September 2024

Acknowledgements

I am immensely grateful to the participants of this study, the institution that granted me permission to conduct this study and my supervisor, Fatima Makda, who assisted with critical comments so that I could finalise this submission. Without them, this study would not have been possible. To my friends and family, your support means the world to me.

Table of Contents

Chapter 1: Background of the study	9
1.1 Introduction	9
1.2 Conceptual premise for the study	11
1.3 The status of ICT integration in Higher Education	11
1.4 The statement of the problem	12
1.5 The aims of the research	13
1.6 The context of emergency remote teaching	14
1.7 The paradigm of the study	15
1.8 Theoretical framework	17
1.9 Methodological premise	17
1.10 Conclusion	17
Chapter 2: Literature review	19
2.1 Introduction	19
2.2 Key concepts of the study	19
2.3 The research problem – further insights	24
2.4 Theoretical framework	26
2.5 Summary of the study’s argument	29
2.6 Conclusion	30
Chapter 3: Research methodology and research design	32
3.1 Introduction	32
3.2 Research methodology	32
3.3 Positioning this study: qualitative research	32
3.4 Theoretical framework	35
3.5 The research design	35
3.6 Conclusion	47
Chapter 4: Findings of the study	48
4.1 Introduction	48
4.2 Sub-question one: What was the nature of lecturers’ pedagogy for ICT integration in the introductory economics course during the Covid-19 pandemic?	48
4.3 Sub-question two: What motivated economics lecturers’ pedagogical choices during the Covid-19 pandemic?	51
4.4 Sub-question three: How could the quality of the teaching in the introductory economics course during the Covid-19 pandemic be described?	52

4.5	What are the competencies lecturers need to teach introductory economics with ICT during emergency remote teaching?.....	53
4.6	Conclusion.....	56

Chapter 5: Discussion of the findings.....57

5.1	Introduction.....	57
5.2	Discussion of the major themes of the study.....	57
5.3	Relationship of results to existing studies on economics education and emergency remote teaching.....	66
5.4	Conclusion.....	67

Chapter 6: Concluding remarks.....69

6.1	Introduction.....	69
6.2	Summary of the study.....	69
6.3	Limitations of the study.....	70
6.4	Implications for practices.....	71
6.5	Suggestions for further research.....	72
6.6	Conclusion.....	73

References.....74

Appendices

Appendix A:	Vignette based on the researcher's interpretation of Participant A's experience of teaching with ICT.....	84
Appendix B:	Vignette based on the researchers' interpretation of Participant B's experience of teaching with ICT.....	87
Appendix C:	Ethics clearance protocol number.....	89
Appendix D:	Interview guide for semi-structured interviews with study participants.....	90
Appendix E:	Extract from transcript of video lecture explaining concepts in Chapter 9: Possibilities, preferences and choices.....	91
Appendix F:	Extract from content analysis of interview with Participant A to answer the question: "What was the nature of lecturers' ICT pedagogy?".....	94

List of figures and tables

Figures

Figure 2.1	The Teacher Response Model (TRM) of ICT integration.....	27
Figure 2.2	Components of the theoretical framework in this study.....	30
Figure 3.1	List of data sources in this study.....	41
Figure 3.2	Maxwell's interactive model of research design applied to this study.....	46

Tables

Table 1.1 Assumptions that underscore the study.....	16
Table 3.1 Common features in interpretivism and qualitative research.....	34
Table 3.2 Elements of the research design employed to promote trustworthiness in the study.....	45
Table 4.1 Competencies evident in the introductory economics lecturing team.....	54
Table 5.1 Application of the TRM to the decision to deploy all assessments online.....	59

List of abbreviations

CHE	Council on Higher Education
ERT	Emergency Remote Teaching
HE	Higher Education
ICT	Information Communication Technology
LMS	Learning Management System
MCQs	Multiple Choice Questions
SA	South Africa
TQF	Teaching Quality Framework
TRM	Teacher Response Model
Q&A	Question-And-Answer

CHAPTER 1: BACKGROUND OF THE STUDY

1.1 Introduction

This study examined how lecturers in the economics department at an urban university in South Africa (SA) used information communication technology (ICT) to teach an introductory economics course during the Covid-19 pandemic. The ideas which informed this research are situated in learning theory in the context of economics education, with specific reference to the Teacher Response Model (TRM) (Kopcha et al., 2020) and Darling-Hammond's Teaching Quality Framework (TQF) (2021). The main argument that underpinned the research was that a lecturer's ability to teach economics with ICT is essential for teaching quality (Darling-Hammond, 2006). Since ICT has the potential to enhance teaching (Ndlovu & Moll, 2016), how ICT is used to teach is a crucial consideration. Consequently, the main question this study posed was *How do lecturers use ICT to teach introductory economics during the Covid-19 pandemic?*

To introduce the conceptual premise of the study, the first section discusses learning theory with reference to how ICT is used to teach introductory economics, and this is followed by commentary on ICT in higher education (HE). The next sections discuss the statement of and the problem, aims of the research and emergency remote teaching (ERT). Finally, the paradigm and theoretical and methodological premises are briefly introduced.

1.2 Conceptual premise for the study

The main research question concerned teaching with ICT in an introductory economics course during the Covid-19 pandemic. Therefore, it is pertinent to outline what teaching encompasses, with specific reference to the role of ICT. It is also germane to understand the distinctive nature of teaching economics in relation to ICT. These ideas are introduced in the next section and will be elaborated upon in the literature review chapter.

1.2.1 Teaching and learning with ICT

In the context of this study, teaching concerned lecturers' ability to integrate ICT in their practice. There are diverse views of the nature and purpose of ICT integration, for example, Sackstein et al. (2023) assert that technologically deterministic researchers presume the purpose of ICT integration is adoption. From a pedagogical perspective,

Ndlovu and Moll (2016) posit that ICT is a component of pedagogy which has the potential to enhance teaching through effective teaching methods, approaches, dialogues, and resources. Laurillard (2002) considers teaching with ICT to be the process of mediating learning. In a similar vein, Beetham and Sharpe (2020) declare that teaching and learning are inextricably linked, and that teaching is about guiding students to learn. It is a dialogue between learning and teaching and involves how lecturers think, talk about and structure activities of learning and teaching. This pedagogical approach to ICT integration is the one adopted in this study.

Pedagogical perspectives view ICT integration as a process in which technology resources and practices are incorporated (Lawless & Pellegrino, 2007) to promote (Ndlovu & Moll, 2016), mediate (Laurillard, 2002) and guide (Beetham & Sharpe, 2020) student learning. The properties of technology that facilitate teaching and learning, include features such as (a) its accessibility, (b) its diverse formats and (c) the fact that it encourages communication and collaboration (Conole & Dyke, 2004). If one considers a learning management system (LMS), these properties are evident: students and lecturers can access course material remotely and an LMS contains a variety of assessment, content management and collaboration tools. It is important to note that on its own the LMS does not enable learning but that it takes a skilled lecturer to harness the affordances of technology to facilitate student learning.

An understanding of lecturers' role in teaching with ICT is influenced by conceptions of learning (Fives et al., 2015) and learning theory proposes how people learn and the nature of knowledge (Hein, 1991). If one believes that there is a relationship between learning and teaching and that the lecturer's role is to guide students to understanding, then this assumes that learning is an active process and that it involves discovery. These ideas are informed by constructivist learning theory which asserts that learning is an active process in which students construct knowledge based on what they know and through their engagement with the world (Bada & Olusegun, 2015). Therefore, a lecturer who adopts a constructivist perspective will encourage active learning by asking questions to assess background knowledge while demonstrating complex economic models on a digital whiteboard.

A lecturer with a constructivist perspective may integrate ICT by structuring activities that promote knowledge creation through collaboration with others, by using discussion forums for example. In terms of learning design, scaffolded learning opportunities are provided (Bates, 2022), lecturers tap into students' prior learning and experiences (von Glaserfeld, 1995), interrogate assumptions, and mediate learning through active teaching techniques (Darling-Hammond, 2020).

1.2.2 Pedagogical challenges in teaching introductory economics

The discipline of economics, in particular, introductory economics, was the focus of this study. There are several challenges in teaching economics. Picault (2019) highlights two: (a) the skill in helping students conceptualise and (b) the skill in helping students apply economic theory. In terms of conceptualising economic theory, lecturers must be able to support learning by demonstrating the relationships between economic variables (Siegfried et al., 2001) using a variety of teaching tools. When it comes to encouraging application, it helps if lecturers provide real-world examples which enable students to see the relevance of, and apply economic theory to their world (Depro, 2022).

In addition to these pedagogical challenges, introductory economics classes are often crowded (Jansen, 2018) and the majority of students have experienced an inferior basic education (Bokana & Tewari, 2014). This affects teaching, and lecturers often struggle to complete the curriculum in the requisite time (Picault, 2019). ICT could be used to remediate these challenges. For example, electronic clickers can be used for formative assessment (Johnson & Meder, 2024), simulations can be used to help students apply economic concepts (Hoyt & Mc Goldrick, 2019) and digital whiteboards can assist lecturers to demonstrate complex economic relationships (Allgold & Mc Goldrick, 2023). Yet the majority of economics lecturers continue to use traditional modes of teaching (Asarta et al., 2021). The next section provides some insights into this phenomenon.

1.3 The status of ICT integration in HE

The digitisation of learning and teaching in HE is enabled by the growing availability and access to diverse technologies (Maphalala & Adigun, 2021) and this was accelerated by the Covid-19 pandemic which prompted mass adoption of ICT at institutions of HE (Johnson & Meder, 2024; Shava, 2022). However, access and availability do not

automatically lead to effective teaching with ICT (Bates, 2022; Cuban et al., 2001) and there is a need to develop specific competencies to teach with ICT (Dewa & Ndlovu, 2022). While there is an awareness that HE institutions in SA need to improve the quality of teaching (Department of Higher Education and Training, 2018), in terms of ICT integration, there is no formal policy to guide lecturers (Ng'ambi et al., 2016). Moreover, at an institutional level, professional development support is insufficient (Council on Higher Education (CHE), 2021; Dhlamini & Mbatha, 2018) and there have been several calls to professionalise the sector (Bates, 2019; Ndebele, 2022; Tewari & Ilesanmi, 2020). The challenge of teaching with ICT is further compounded by the fact that many lecturers do not fully exploit the capabilities of ICT (Dewa, 2022) and tend to use ICT in limited ways (Tondeur et al., 2016). Possible reasons for this challenge will be considered in the literature review.

1.4 The statement of the problem

The Covid-19 pandemic forced many institutions to rapidly move to online learning (Burns, 2020), emphasising the critical need for lecturers to adopt innovative teaching approaches (Dlamini & Ndzinisa, 2020). Despite the benefits of ICT to enrich economics education (Allgold & Mc Goldrick, 2023; Hoyt & Mc Goldrick, 2019; Johnson & Meder, 2024), many lecturers continued to rely heavily on traditional lecture-based approaches (Asarta et al., 2021), limiting the depth and breadth of student learning. For example, Asarta et al. (2021) found that the mean time devoted to traditional lectures in introductory economics classes was 83%. The fact that lectures dominate economics education is concerning because it places the burden of conceptualisation and application on lecturers (Picault, 2019). It also raises the question as to whether a lecture is the best way to mediate understanding. For example, if learning is an active construction of knowledge and students build on existing knowledge, it is difficult to imagine how this may occur in a lecture where information is presented for the class as a whole and not for an individual student's understanding. Thirdly, in the context of ERT, in what form (if any), did the traditional lecture evolve, and could this format facilitate learning?

This reliance on traditional methods (Ojo, 2023) is exacerbated by factors such as limited ICT knowledge and skills among lecturers (Dewa, 2022), as well as institutional barriers to ICT adoption (CHE, 2021; Waghid, 2023). This study aimed to address this gap by

examining lecturers' ICT teaching practices in an introductory economics course, identifying the specific ICT competencies required for effective teaching, and exploring strategies to support their pedagogy. The findings of this research can contribute to the development of evidence-based guidelines for ICT use in economics education, ultimately improving student learning outcomes and preparing pre-service teachers for the demands of the digital age.

1.5 The aims of the research

This qualitative study attempted to contribute to knowledge on economics education, with particular reference to ICT at a higher education institution in South Africa (SA). The purpose was two-fold: (a) to examine lecturers' ICT teaching or pedagogy in introductory economics and (b) to identify the ICT competencies needed to teach introductory economics.

The central question this study asked was *How do lecturers use ICT to teach introductory economics during the Covid-19 pandemic?* To answer this question, the following sub-questions were posed, namely:

1. What was the nature of lecturers' pedagogy for ICT integration in the introductory economics course during the Covid-19 pandemic?
2. What motivated economic lecturers' pedagogical choices during the Covid-19 pandemic?
3. How could the quality of the teaching in the introductory economics course during the Covid-19 pandemic be described?
4. What are the competencies needed to teach introductory economics with ICT during ERT?

The first and second sub research questions were posed in order to describe the nature of lecturers' ICT pedagogy and the motivation for their ICT choices. The third question evaluated the quality of teaching in general and the final question identified the particular qualities need to be an effective lecturer in introductory economics. By answering these questions, this study attempted to answer some of the pressing post-pandemic questions about how to teach more effectively with ICT for the benefit of student learning (Makonye & Ndlovu, 2022).

More than three decades ago, Becker (1991) lamented the lack of research in economics education in the United States of America, and more recently, Jeannin and Ojo (2021) reiterated this view in the context of SA. Research on economics education is ubiquitous in the West (Johnson & Meder, 2024) and although the content and structure of the programmes in the West are similar to the economics taught in South Africa (Ojo, 2016), the context of learning and teaching is different. Consequently, international studies have limited application.

Furthermore, there is a dearth of local studies on the role of ICT in economics teaching at tertiary institutions and the studies that have been conducted in the area tend to be unrelated to ICT. For example, in the *SA Journal of Economics*, which represents the field of economics in SA, the researcher found only one study published since 2005 that specifically addressed ICT in economics teaching at tertiary level in SA. Moreover, studies in economics teaching adopt quantitative approaches as the discipline becomes more quantitative in nature (Luiz, 2009 as cited in Yu, et al., 2017; Johnson & Meder, 2024). Therefore, this qualitative study attempted to fill a contextual and methodological gap in the literature on economics education in SA.

The next section discusses pertinent contextual factors of the study.

1.6 The context of ERT

This study started in March 2020, interviews were conducted in July 2020 and data were collected from July to December 2020. This was a period when the Covid-19 pandemic forced tertiary institutions to move learning and teaching online to prevent the spread of the corona virus. Consequently, many lecturers were not sufficiently prepared to adapt their teaching methods, assessment, content and learning outcomes (CHE, 2021) and the speed at which the transition occurred (Burns, 2020) meant that the majority of lecturers did not have the necessary instructional design competencies for remote teaching and online learning (Dlamini & Ndzinisa, 2020). Many lecturers were underprepared for the transition (Ugwuanyi et al., 2023) and, while Czerniewicz et al. (2020) point out that ERT exposed poor pedagogies, they remind us that these practices existed before the pandemic. This suggests that the problem of poor pedagogies has not been adequately addressed in HE.

A significant point about studies conducted during the Covid-19 pandemic was emphasised by Hodges et al. (2020) who observed that well-designed online courses require several months to develop and implement. Since ERT was a temporary alternative to course delivery brought upon by a crisis (Hodges et al., 2020), it is important to bear this in mind when interpreting and analysing lecturers' ICT practices in the introductory economics course.

1.7 The paradigm of the study

In research, a paradigm refers to the researcher's worldview. This study adopted an interpretivist paradigm which considers social phenomena to be grounded in social conventions that require interpretation (Jansen, 2019). Similarly, Scott and Morrison (2006) posit that for interpretivists, social reality consists of individuals' attempts to interpret the world and therefore researchers try to understand phenomena by remaining close to participants' construction of meaning. The notion of interpretation is therefore central to interpretivism and it informed this qualitative study in the following ways: data were derived from subject accounts recorded in interviews and content analysis was used to analyse and interpret learning materials.

Nieuwenhuis (2019) argues that all research is based on the researcher's paradigm which in turn, is based on their assumptions about the nature of reality (ontology), the theories that explain reality (epistemology) and how to investigate reality (methodology). If one considers the researcher's assumptions about ICT integration as an example, the interpretivist paradigm was appropriate because it argued that economics lecturers' practices are shaped by perceptions of the learning environment and this presents a subjective account of what is possible with technology based on lecturers' interpretations of their reality (ontology). Since lecturers' ICT pedagogy is influenced by internal factors, the researcher uses theoretical frameworks (epistemology) that support this assumption and develops a qualitative study that accounts for lecturers' subjective experiences of teaching with ICT through interviews and content analysis of learning materials to understand lecturers' ICT pedagogy (methodology).

Table 1.1 further delineates the assumptions of this study to illustrate how the paradigm shaped it.

Table 1.1: Assumptions that underscore the study

	Ontology	Epistemology	Methodology
Lecturers' ICT practices	The use of ICT in teaching is influenced by individual factors.	Best explained by a) lecturers' perceptions of technology use (Kopcha et al. 2020 TRM); b) lecturers' knowledge, how student needs are met and self-reflection (Darling-Hammond, 2021, TQF)	Qualitative study: researcher constructs meaning by interpreting participant (lecturer) accounts and analysing learning materials.
Introductory economics	Challenging to teach because students struggle to conceptualise and apply concepts.	Constructivist learning theory best describes how the subject should be taught to promote learning.	Qualitative study: researcher constructs meaning by interpreting participant accounts and analysing learning materials.
Teaching	Is inextricably linked to learning and concerns how teachers enhance, guide and mediate learning.	Constructivist learning theory.	Qualitative study: Analysis of LMS material & interpretation of participant interviews.

The next section outlines the theoretical framework that supported this qualitative study.

1.8 Theoretical framework

Kopcha's Teacher Response Model (TRM) (2020) and Darling-Hammond's Teaching Quality Framework (TQF) (2021) comprised the theoretical framework for this study. The TRM suggests that decisions to integrate ICT are based on lecturers' desire to do what is best for their students and to complete their professional duties through technology. It further posits that ICT integration is influenced by lecturers' perceptions of what is possible with technology and that those perceptions change, depending on the learning and teaching environment.

Darling-Hammond's TQF (2021) was employed to support the TRM: it posits that teaching quality should be made explicit and that all lecturers can learn to become good lecturers. Therefore, teaching quality is the extent to which lecturers possess knowledge of content, pedagogy, and students; how well they meet students' academic, social, and emotional needs; and the extent to which they reflect on and research their practice.

1.9 Methodological premise

This qualitative study used personal accounts to interpret lecturers' experience of teaching introductory economics and it employed content analysis to analyse a variety of teaching and learning materials in order to answer the main research question *How do lecturers use ICT to teach the introductory economics course during Covid-19?* Stemler (2001) describes content analysis as an organised way of condensing many words into fewer subject categories based on rules of coding. Appendix F outlines the coding process the researcher used to conduct content analysis and will be elaborated on in chapter three.

1.10 Conclusion

In closing, in the aftermath of the Covid-19 pandemic, conversations about the future of teaching and learning have become critical (Menon & Motala, 2022), especially given the expectation that lecturers integrate ICT into their teaching practice (Sciabarrasi, 2023). Support and teaching staff involved in economics teaching and learning, professional development and senior management may find the insights useful. Rapanta et al. (2021), quoting Pope Francis (2020) about the Covid-19 pandemic state that "The only thing worse than this crisis is the tragedy of wasting it, in the sense of failing to learn from it." (The Vatican, Homily at Pentecost, 2020, paragraph 7). This study is an attempt to learn

from the experiences of lecturers in an introductory economics course so that teaching and learning can be improved.

This chapter introduced the conceptual, methodological, and theoretical premise of the study. It highlighted the problem that economics lecturers do not integrate ICT into their teaching, and this affects the quality of their practice. Some of the factors that affect teaching and learning were discussed and the context of ICT in HE and introductory economics and ERT were explained. The research aims and paradigm of the study were discussed, and the theoretical and methodological premise of the study were delineated. In terms of the structure of the rest of the research report, chapter two provides a review of the literature, chapter three discusses the research methodology and research design, chapter four presents the findings, chapter five discusses the findings and chapter six offers concluding remarks.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Chapter one described teaching and learning with ICT and highlighted the challenges lecturers face in teaching introductory economics. After a brief account of ICT in HE, it presented the research problem: that lecturers in introductory economics do not use ICT sufficiently to teach and this influences the quality of teaching. The context of ERT was discussed, as well as the paradigm of the study and its theoretical and methodological frameworks. The purpose of the study was to examine economics lecturer's ICT pedagogy and identify competencies required to teach the subject.

To clarify the research question and develop the argument of the study, this chapter offers a review of the literature on learning and teaching, ICT integration and introductory economics. The first section explains key concepts in the study, and this is followed by an elaboration of the research problem. The next section describes the theoretical framework and the rationale for choosing it. Interweaved throughout this chapter are studies in ICT integration and introductory economics that support or refute the claims of the main argument. The chapter concludes by summarising the assumptions of the study.

2.2 Key concepts of the study

This part of the chapter introduces key concepts and provides the context for understanding the research problem and the argument of the study.

2.2.1 Teaching and learning: a constructivist perspective

As mentioned in chapter one, the researcher supports a constructivist view of learning and teaching which posits that learning takes place through active engagement with the world (Bada & Olusegun, 2015; Piaget, 1969; Vygotsky, 1978). As a learning theory, constructivism signaled a fundamental shift in thinking about learning (Koschmann, 1996) because it challenged the notion that students were passive recipients of knowledge (von Glaserfeld, 1995). Jean Piaget and Lev Vygotsky were leading figures who promoted this discourse (Moll, 2022).

In addition to students being active participants, in the context of ICT integration, teaching and learning are seen as inextricably linked (Beetham & Sharpe, 2020). Teaching

is depicted as a dialogue between learning and teaching and it encompasses what lecturers think, talk about and how they structure activities of learning and teaching (Beetham & Sharpe, 2020). This characterisation is congruent with the tenets of constructivism because it explicitly acknowledges the lecturer's guiding role in the learning process. Secondly, it depicts teaching as a thoughtful process, an idea which is congruent with the TRM's focus on decision-making and Darling-Hammond's (2021) view of the significance of self-reflection. Based on the features of teaching and learning outlined in this section, one could say that teaching with ICT is a practice or pedagogy that employs ICT to mediate (Laurillard, 2002), enhance (Ndlovu & Moll, 2016) and guide (Beetham & Sharpe, 2020) student learning.

The next section introduces the concepts ICTs and ICT integration from different theoretical perspectives and with reference to the study.

2.2.2 ICT

ICTs is an acronym for information and communication technologies which refers to a diverse set of technological resources used to transmit, store, create or exchange information (UNESCO, 2022). In education, ICT is used to manage teaching and learning: for example, to deliver lectures, to store materials and communicate with students. In the context of this study, ICT resources included the LMS which was used to manage the introductory economics course, the video conference tools used for synchronous teaching, the video lectures developed, the camera and microphone used to deliver lectures remotely, the data and laptops provided to students during ERT, the networks and infrastructure that supported ERT, as well as other miscellaneous tools and resources employed to manage and deliver the introductory economics course.

2.2.3 ICT integration

Although definitions are useful to operationalise constructs, the field of educational technology in which this study is located, is complex and there are several ways to view ICT integration. From a sociological perspective, researchers like Selwyn (2014) argue that ICT exacerbates inequality in society and therefore discourses of ICT integration reflect particular ideologies. For example, some researchers dismissed the rhetoric popularised during ERT that technology would save the academic year (Burns, 2020)

because they believed it was encouraged to feed the commercial interests of big technology companies (Williamson, 2020). Similarly, other researchers adopt technocentric approaches to ICT integration and assume that the purpose of ICT integration is adoption (Sackstein et al., 2023).

A pedagogical definition of ICT integration such as the one adopted in this study could be summarised as follows: ICT integration is the process in which technology resources and practices are incorporated into teaching and learning (Lawless & Pellegrino, 2007) with the potential to enhance (Ndlovu & Moll, 2016), mediate (Laurillard, 2002) and guide (Beetham & Sharpe, 2020) learning. In the context of this study, the dominant technology resource was the institution's LMS and the teaching practice was emergency remote teaching, which was discussed in chapter one. An example of a teaching strategy adopted to enhance learning in the introductory economics course were the question and answer (Q&A) sessions in which one of the study participants facilitated understanding of economic constructs. Another example of how lecturers in the study mediated learning was when one of the lecturers used a whiteboard to demonstrate economic equations to guide understanding of the relationship between economic variables.

2.2.4 Economics education and introductory economics

This section considers the broad discipline of economics education, the introductory economics course in general, and the specific course in the study. Relevant studies are integrated into this section to highlight key aspects of economics education.

Becker (2001) delineates economics education as the study of economics teaching which includes the content or curricula, the teaching methods, appraisal of those methods and topics of general interest to economics teachers. Section 1.2.2 outlined the challenges inherent in teaching introductory economics, i.e. the fact that lecturers need to be competent to guide students to conceptualise and apply economic ideas. It also suggested that while ICT has the potential to relieve some of these challenges, the majority of lecturers use traditional lecture formats (Asarta et al., 2021). This suggests nothing has changed since Becker (2000) recommended that economics teaching should incorporate technology and move away from “chalk and talk” (Becker, 2000, p.113).

More recently, in terms of global disciplinary trends in economics education, Johnson and Meder's (2024) meta-analysis of 23 years of teaching with technology in undergraduate economics, indicate that due to significant innovation, more lecturers are using digital tools to teach. The authors note that many studies prioritise empirical assessment that quantitatively measure the impact of ICT tools at the expense of pedagogical discussion. Therefore, there is a need to focus on *both* pedagogy and ICT integration and this study answers this need with its focus on lecturers' teaching methods in an introductory economics course.

In terms of the study, the introductory economics course was offered as a service module to students from faculties of science, commerce, engineering, and the humanities (Schoër et al., 2010). The course was typical of courses in tertiary institutions in SA in that it comprised two modules: Principles of Microeconomics and Principles of Macroeconomics (Yu et al., 2017). These courses were offered in both semesters so that students who failed in the first semester, had the opportunity to repeat the module in the second semester. The macroeconomics component covered 11 topics over a 13-week period while the microeconomics component covered 12 topics over the same period. Four lecturers were responsible for teaching the microeconomics and macroeconomics courses respectively (therefore eight in total) and one of the participants was from the microeconomics stream while the other was from the macroeconomics stream.

As mentioned in section 1.5 there is a dearth of research on ICT in economics teaching at tertiary level in SA. Given the limited research, a comprehensive review of the literature on teaching introductory economics with ICT in SA was not possible. However, there are two studies which are relevant to this study: the first concerns van der Merwe's (2007) study of an online course and its impact on student motivation and performance.

In this study, an introductory economics course was deployed on the tertiary institution's course management system, which hosted various learning materials (e.g. study guide, the online textbook, finance news articles, tutorials, and self-test quizzes). Research findings indicated that student motivation improved compared to face-to-face teaching and this was attributed to the course content which featured examples of real-life application. This study is consistent with Picault's (2019) claim that one of the challenges economics lecturers face is helping students apply economic theory to their lives. The

idea that students need to apply concepts to real-life situations in order to construct knowledge is supported by constructivist learning theory and therefore the context of economics education is pertinent to this study.

The second study is a doctoral thesis by Ojo (2016) which investigated how lecturers and tutors in an introductory economics course perceived their teaching and tutoring roles. While this study did not explore ICT specifically, its findings about pedagogy and economics are relevant because it examined a similar cohort of lecturers and therefore this thesis will be referenced in the findings and discussion chapters. The study recommended that the economics curriculum should be congruent with the experiences of undergraduate students; that it was essential to transform the curriculum to be compatible with global debates in the discipline and that the lecturing team should develop its pedagogical practices. More recently, Ojo (2023) outlined several ideas for transforming the discipline including a call for pluralism of the curriculum, teaching that embraces ICT, is culturally responsive and differentiated, and assessments which are student-centred.

2.2.5 Competence

One of the aims of this study was to identify the competencies lecturers need to teach introductory economics, therefore it is necessary to understand what is meant by competence in the context of ICT integration. Fröm (2017, citing Käck & Männikkö Barbutiu, 2012) argues that in teaching, digital competence involves more than knowing how to use digital tools, and that it includes an understanding of what ICT can do, as well as possessing the necessary skills, knowledge and attitudes to teach effectively. This description of competence will be applied in the analysis and interpretation phase of the study.

2.2.6 Emergency Remote Teaching (ERT)

The study was conducted during ERT when teaching practices were atypical of previous years. Ifinedo and Kankaanranta (2021) state that it is crucial to consider contextual factors which exert an influence on the teaching and learning system in ICT integration (Buehl & Beck, 2015). Section 1.6 discussed ERT and described it as a temporary alternative to course delivery as a result of the Covid-19 pandemic (Hodges et al., 2020).

ERT also exposed poor pedagogies (Czerniewicz et al. 2020) and was a period of disruption (Menon & Motala, 2022). With this in mind, the findings of this study must be understood in the context of significant change in teaching practice (CHE, 2021). It was previously mentioned that teaching economics is associated with unique challenges. Managing the course remotely was difficult because lecturers could not use traditional teaching methods, and they were faced with the problem of how to facilitate learning remotely. This study attempted to explain some of these challenges and to consider the competencies that may support teaching introductory economics with ICT in the future.

It is crucial for HE institutions to engage in debates about ERT as they forge a strategy for the future, because, as Bates (2021) comments, it will take some time before the full impact of ERT on learning is known. Therefore, it is necessary to reflect on past experiences in order to plan for the future. Bozkurt et al. (2020) stress the need for professional development of lecturers and note that online teaching strategies should not attempt to mimic traditional pedagogies because the affordances and constraints between the two learning environments are different.

Debates on ICT in education have been forced into the spotlight since the Covid-19 pandemic and this is evident in the explosion of studies (Le Grange et al., 2022) on the topic. There is renewed interest in the teaching of economics (Arnold, 2022; Engelhardt et al., 2021; Johnson & Meder, 2024; Medhekar & Saha, 2021) and opinions of the impact of the pandemic on education are divided. Some argue that the pandemic provided and continues to provide an opportunity for education to be transformed, while others are more critical of this idea (Le Grange et al., 2022). The researcher is optimistic that the pandemic can provide an opportunity for education to be transformed and therefore one of the goals of this study is to examine the competencies that support teaching with ICT in introductory economics.

2.3 The research problem – further insights

This study argued that the ability to use ICT to teach introductory economics is essential for teaching quality (Darling-Hammond, 2006). While ICT offers many benefits (Conole & Dyke, 2014), lecturers do not harness the benefits of technology (Dewa, 2022) and they continue to use ICT in limited ways (Asarta et al., 2021; Ojo, 2023). There are several reasons for the limited use of ICT in teaching and learning and one of the ways to analyse

the problem is to consider the external and internal constraints and supports that enable or hinder ICT integration (Coleman & Mtshazi, 2017; Ertmer, et al., 2012). Examples of external constraints include (a) institutional complacency (Waghid, 2023), (b) socio-economic factors (Soudien et al., 2022) and (c) social factors (Msimanga et al., 2021). Internal constraints are the lecturers' individual characteristics which prevent optimal ICT integration, for example, (d) their beliefs (Ertmer, 2005) (e) their knowledge (Mishra & Koehler, 2006) (f) their experience (Paetsch et al., 2023) and (g) their perceptions of the ICT environment (Lawless & Pellegrino, 2007). This study considered the individual factors that impact lecturers' ICT pedagogy and attempted to understand the nature of lecturers' practice in the context of an introductory economics course during the Covid-19 pandemic.

Chapter one highlighted the fact that lecturers of introductory economics need the competency to explain and conceptualise complex economic relationships to students and to assist them to apply this knowledge to real-life (Picault, 2019). However, many lecturers continue to use the traditional lecture format (Asarta et al., 2021) which may not be the best pedagogy to help students conceptualise and apply economic theory. It is important to note that the challenge of the limited use of ICT is more widespread than introductory economics and that it affects institutions of HE in general (Ng'ambi et al., 2016). As evidence, Ng'ambi et al.'s (2016) 20-year review of technology-enhanced learning and teaching found that while SA lecturers have not fundamentally changed their teaching strategies, opportunities exist for them to shape their learning and teaching context through ICT.

The consequences of lecturers' inertia is that students do not benefit from quality teaching, a fact which was brought into sharp relief during ERT (Allgood & McGoldrick, 2023). Although not the focus of this study, teaching quality can affect learning outcomes (Blömeke et al., 2016; Ndebele, 2022; Ramsden, 1992). Moreover, lecturers' confidence is negatively affected (Ali, 2020; Ertmer & Ottenbreit-Leftwich, 2010) if they do not know how to use the tools to teach. In closing this section, the challenge of the limited use of ICT to teach introductory economics has become even more critical since the advent of the Covid-19 pandemic because many institutions have now adopted some form of online learning and teaching (Maphalala & Ajani, 2023). Therefore, it is important to

examine lecturers' response to online teaching during this period in order to learn from this experience and to identify the competencies needed to teach introductory economics.

2.4 Theoretical framework

This section of the chapter discusses the theoretical framework which informed the study. The reason that two frameworks were employed is that they complemented and supported the purpose of the study and therefore it was pragmatic to use them in tandem.

2.4.1 The Teacher Response Model (TRM)

Like many academics in the field of education technology (Ertmer et al., 2015), Kopcha et al. (2020) studied the internal constraints that prevented optimal use of ICT to teach and continued to find a mismatch between professed pedagogy and actual use (Buehl & Beck, 2015). Kopcha (2020) stated that instead of asking if teaching were teacher-centred or student-centred, it would be more beneficial to consider the process of decision-making to use ICT. The argument is that ICT pedagogical decisions are based on lecturer's motivation to do what is best for their students and to complete their professional duties through the use of technology.

Kopcha (2020) developed the TRM, a model, when applied to HE institutions, which describes the relationship between lecturers' beliefs, knowledge and experience, their use of technology, and their perceptions of what is possible with technology in a particular context. The model is based on three core ideas about teaching with ICT, namely, (a) Lecturers ascribe value to ICT and are more likely to use it if it helps them manage their professional responsibilities. Therefore, lecturers ask, "What is best for me and my students and how can technology help?" (b) ICT is rooted in a dynamic teaching and learning system informed by diverse factors and lecturers' responses are therefore emergent and (c) Decisions to integrate ICT are affected by what lecturers believe is possible with technology (Kopcha et al., 2020).

The model was one of the lenses through which the data in this study were analysed and discussed, and Figure 2.1 depicts its components.

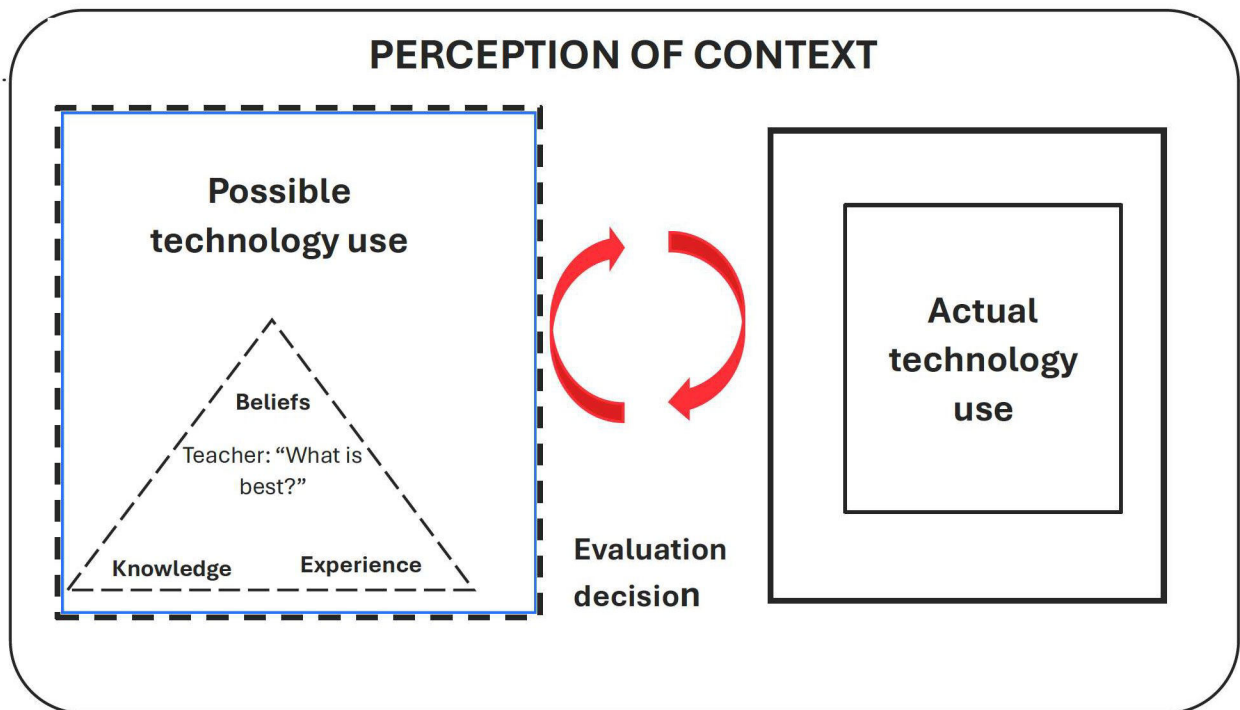


Figure 2.1: The Teacher Response Model of ICT integration

Source: Kopcha et al., 2020, p. 736

The triangle in Figure 2.1 represents the lecturer's beliefs, knowledge and experience, and the square around the triangle represents the lecturer's perception of the possible use of technology. The dotted lines indicate that there is a constant dialogue between perceptions of the context and what is deemed possible with technology.

The TRM was a suitable framework to use in this study for several reasons: *a)* in accounting for individual factors which influence ICT decisions, it places lecturers at the centre of pedagogical decision-making and emphasises their role as mediators of student learning; *(b)* it acknowledges the significance of contextual factors in the learning environment which supports the idea that learning and teaching are relational and inextricably linked and *(c)* the individual approach is supported by the interpretivist paradigm which is adopted in the study.

2.4.2 Teaching Quality Framework (TQF)

The second lens employed in this study was Darling-Hammond's TQF (2021). Darling-Hammond (2021) proposes that teaching quality should be made explicit, and that competence is possible by all lecturers in the profession. Therefore, teaching quality is

the extent to which lecturers possess knowledge of content, pedagogy, and students; how well they meet students' academic, social, and emotional needs; and the extent to which they reflect on and research their practice.

These themes are reaffirmed in several studies of cohorts in the SA education landscape. For example, Adu (2023) studied economics teachers in the Further Education and Training phase at schools in the Eastern Cape and found there was a need for improved competence in teacher's content knowledge and pedagogy while Knoetze and du Toit (2022) explored knowledge of students in their study of tertiary student's engagement in their studies during emergency remote teaching (ERT). Van Wyk (2017) examined how student teachers' use of e-portfolios improved their ability for self-reflection. These are a fraction of a myriad of studies concerned with the importance of content knowledge, pedagogical knowledge, knowledge of students and the importance of self-reflection and research for effective teaching practice.

The TQF supports the TRM and is useful to answer sub-question three concerning the quality of teaching and to provide an overview of the nature of lecturers' pedagogy for ICT in introductory economics. The framework is consistent with the argument introduced in chapter one that positions learning and teacher in constructivist terms as promoting (Ndlovu & Moll, 2016), mediating (Laurillard, 2002) and guiding (Beetham & Sharpe, 2020) student learning. This can be seen in that an understanding of students is foregrounded ("knowledge of students" and "how well they meet student's academic, social and emotional needs") and lecturers are shown to mediate and guide learning ("knowledge of pedagogy and content"). Therefore, this framework is a congruent element of the theoretical framework and it supports the researcher's conceptual premise for teaching and learning.

Nilsen et al. (2016) make a distinction between teacher quality and instructional (teaching) quality. They argue that teacher quality concerns the level of education; job experience and participation in professional development and self-efficacy. Whereas instructional (teaching) quality is reflected in teachers' ability to challenge students to apply knowledge through problem solving; by providing a supportive climate for learning; by the clarity of instruction and efficient classroom management. While this approach broadens the notion of teaching quality, it creates an unnecessary distinction

between the characteristics of the teacher and the practice of teaching which are intrinsically linked since teacher quality impacts teaching quality (Venkat & Spaul, 2015).

By way of an example, effective economics lecturers utilise their knowledge of economics content and how to teach economics as well as their understanding of students' conceptual gaps in the subject to promote learning. They recognise the level of student's ICT access (social needs); support students' apprehension for new technologies (emotional needs); assess students fairly (academic needs) and reflect on the efficacy of their teaching. The application of the framework to the study will be revisited in the findings and discussion chapters later in the report.

2.5 Summary of the study's argument

The argument which underlined this study comprised several claims, the first being that individual factors determine how ICT is integrated into teaching. Secondly, the use of ICT is essential for teaching quality. Thirdly, teaching quality means that ICT enhances teaching practice. Fourthly, teaching quality can be measured.

The first part of the argument that individual factors (beliefs, experience, perceptions, knowledge) influence decisions to use ICT is based on an assumption that it is individual and not external factors that explain how and why ICT is integrated into teaching and learning. The second part of the argument that teaching quality means being able to teach with ICT is based on the assumption that the ability to use ICT is a hallmark of teaching quality. The third part of the argument concerning the characteristics of teaching quality is based on the assumption that every lecturer has the ability to improve their practice and the fourth part of the argument that teaching quality can be measured, is based on the assumption that an external measure of quality teaching exists.

2.6 Conclusion

In closing this chapter, Figure 2.2 illustrates the components of the theoretical framework using an example of a lesson on opportunity cost.

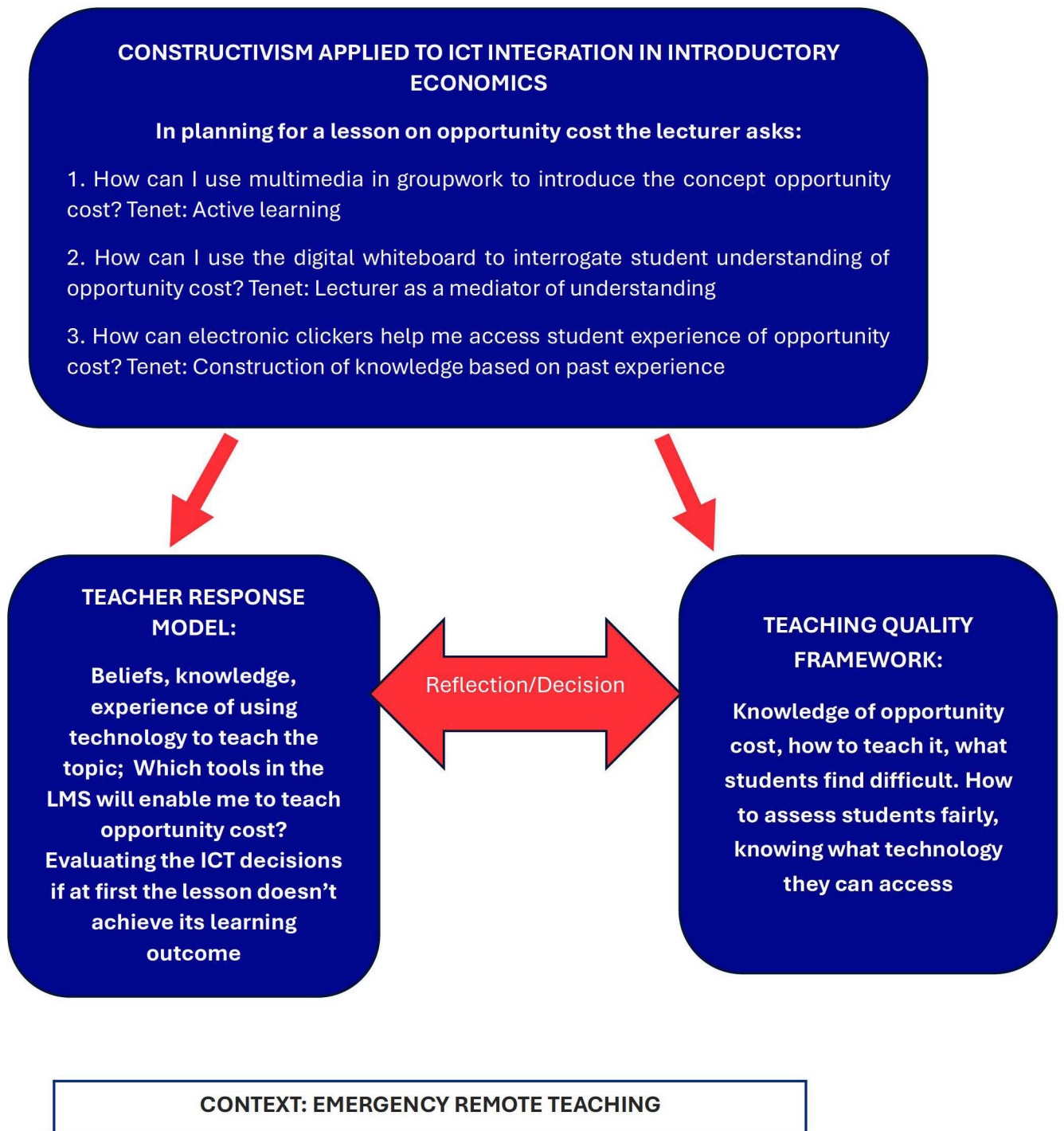


Figure 2.2 Components of the theoretical framework in this study

Notes: The diagram illustrates that constructivist learning theory is the “big idea” (Bada & Olusegun, 2015, p.69) which informs assumptions of teaching and learning. The TRM and TQF are the key components of the theoretical framework and appear on the second level. Both components have the idea of reflection or decision-making in common. The lowest level indicates the contextual factors that influence the study.

This chapter provided a review of the literature on learning and teaching, ICT integration and introductory economics in order to clarify the research problem and develop the study’s argument. It explained key concepts of the study and elaborated on the research problem. The TRM and TQF as components of the theoretical framework were described and the rationale for their use explicated. Finally, a summary of the key elements in the study’s argument was presented. The next chapter discusses the research methodology and design.

CHAPTER 3: RESEARCH METHODOLOGY AND RESEARCH DESIGN

3.1 Introduction

This study argued that it is essential for quality teaching that lecturers use ICT (Darling-Hammond, 2006) to teach introductory economics (Ojo, 2023). This is a topic of interest because introductory economics lecturers tend to use ICT in limited ways (Asarta et al., 2021) which may affect the quality of teaching. The study suggested that individual factors, i.e. lecturers' beliefs, knowledge and experience of the learning environment (Kopcha et al., 2020) and their knowledge of content, pedagogy and students (Darling-Hammond, 2021) impact how ICT is used. The purpose of this study was to examine how lecturers used ICT to teach introductory economics and to identify competencies that promote effective teaching with ICT in the subject.

The first section of this chapter introduces the concept research methodology: it demonstrates how this qualitative study is congruent with the paradigm (interpretivism) and theoretical framework (TRM; TQF). The second section of this chapter discusses the research design. It shows how the research design adds coherence to the study through applying Maxwell's (2013) interactive model of research design. A recurring theme is coherence and congruence between the various components of the research study.

3.2 Research methodology

Hesse-Biber and Leavy (2011, as cited in Nieuwenhuis, 2019) argue that methodology is the bridge between the researcher's philosophical view (theory/paradigm/philosophy) and method or data collection. For Terre Blanche and Durrheim (2006) methodology is the specifics of studying what can be known about a phenomenon. Since the research methodology informs how the study will be conducted (methods, e.g. interview) it should be congruent with the researcher's paradigm, theoretical framework and the methods or data collections.

3.3 Positioning this study: qualitative research

This qualitative study aimed to examine how lecturers used ICT to teach an introductory economics course during the Covid-19 pandemic and to identify the competencies that

support effective teaching with ICT. Qualitative research is a tradition which is favoured in the social sciences (Cohen et al., 2001, as cited in Maree, 2019) and it can be described as viewing the world from the perspective of those being studied and developing ideas that emerge from multiple stages of data collection (Scott & Morrison, 2006).

In addition to the emphasis on participants' perspectives and the development of knowledge, Nieuwenhuis (2019) highlights the following features of qualitative research which apply to this study, namely, qualitative research (a) relies on linguistic and meaning-making data and extraction of meaning from the data; (b) it concentrates on natural settings and the social world; (c) the main aim is to understand the phenomenon and (d) the study uses strategies to ensure credibility of the design.

In terms of the first category, several types of *linguistic data* were generated in this study which included approximately 754 pages of text and two-and-a half hours of audio-visual material. The data were analysed through content analysis and the purpose was to understand how participants (economics lecturers) used ICT to teach introductory economics and to identify the competencies that promote effective teaching. As mentioned in chapter one, content analysis is a replicative process which involves an organised way of condensing many words into fewer subject categories based on rules of coding (Stemler, 2001). An example of content analysis which employed coding techniques is presented in Appendix F.

The *natural setting* for the study was the introductory economics teaching group and because social distancing and lockdown measures prevented visits to the physical site, the researcher conducted virtual meetings with two lecturers and was given permission to access the course site on the LMS. The *purpose* of the study was to understand how lecturers used ICT in introductory economics and to identify the competencies that are needed to teach introductory economics effectively with ICT. In terms of the *credibility* of the design, this refers to the correspondence between the study's findings and reality which may be achieved through the research design (Nieuwenhuis, 2019). Credibility of the design is achieved by using purposive sampling, ensuring the questions match the design and conducting detailed data collection. The credibility of the design for this study will be discussed in the section research design.

A salient point to mention at this stage is the difference between methods and methodology: methods are tools used to conduct research, whereas methodology is the way in which researchers collect, analyse, describe, and explain phenomenon (Nieuwenhuis, 2019). Consequently, qualitative research methodology is supported by research methods which involve analysing participant responses, and participant-generated documents and artifacts, to interpret their meaning of ICT practices. It used content analysis to achieve this and data analysis is discussed in detail in the section on research methods later in this chapter.

In terms of the congruence of the qualitative tradition to the overall paradigm of interpretivism, Table 3.1 delineates the common features between the interpretivist paradigm and qualitative research study.

Table 3.1: Common features in interpretivism and qualitative research

Interpretivism	Qualitative research study
Interpretation of the world	Importance of participant perspective.
Interpretation of data	Features linguistic and meaning-making data and emphasis is meaning-making and subjective account of phenomena.
Interpretation of events through living in the world	Focus is how participants make meaning of their experience in the social world.

With this table in mind, if the researcher believes that the truth of phenomena is based on an interpretation of phenomena in the social world (how lecturers use ICT to teach), participant feedback will be crucial to inform this understanding. Furthermore, if knowledge is based on the researcher's subjective interpretation of data, the data should be meaningful and capture participants' meaning. Finally, if meaning can be interpreted through the social world, interaction with significant participants in that social world is essential for understanding phenomena.

3.4 Theoretical framework

While the overarching paradigm is interpretivism, the TRM and TQF are theoretical perspectives employed to examine how lecturers used ICT to teach introductory economics. As mentioned in chapter one, the TRM and TQF are informed by constructivism, a psychological theory of learning which argues that learning is an active process of constructing knowledge (Piaget, 1964; Vygotsky, 1978) based on what individuals already know and through interaction with others who are more knowledgeable. Learning is therefore individual and social and the experience of learning varies from person to person. How individuals interpret the world informs how they construct their reality (knowledge/learn) and therefore the principles of constructivism are compatible with interpretivism. The theoretical framework was discussed in the previous chapter and will not be discussed again.

3.5 The research design

This section discusses the concept of research design and uses Maxwell's (2013) interactive model of research design as a framework to discuss the key elements of this study.

Research design is viewed in several ways. Creswell (2012) describes it as the process of data collection, data analysis, and report writing. Mouton (2022) depicts a research design as the plan of how the research is to be conducted. It interrogates the type and outcome of the study. Mouton (2022) further asserts that the research questions are the starting point and that it specifies the type of evidence required to answer the research questions. This notion of research as a logical plan with the research questions at the centre is one that Maxwell (2013) also supports and he proposes five components of a research design, namely, *a*) research questions; *b*) research goals; *c*) conceptual framework; *d*) research methods and *e*) validity (Maxwell, 2013). Considerations of ethics are weaved into each component of this model. Since the research design is an ongoing concern, and its logic and cohesiveness are paramount, the researcher considers how the components fit together with the awareness that each component has an impact on, and is in turn, informed by other components (Maxwell, 2013).

For example, in this study, the research questions informed the data collection methods (interview), which raised issues of how to manage validity threats (asking open-ended questions). Similarly, concerns for managing validity threats affected the data collection methods (triangulating interview data with other data sources). The research questions influenced the method of data collection (interview to collect subjective responses) but the interview method also informed the research questions (asking suitable questions). The research goals informed the research questions and these goals informed the extent of the literature review. Figure 3.2 applies this framework to this study.

The rest of the chapter discusses each of the components of Maxwell's (2013) interactive model of research design.

3.5.1 The research questions

According to Maxwell's (2013) interactive model for research design, the research questions are at the centre of the study, driving the decisions in the remaining four components. In a similar vein, Jansen (2019, p. 3) considers the research questions to be a "beacon", providing focus for data collection. As stated in section 1.5 the main question is *How do lecturers use ICT to teach introductory economics during the Covid-19 pandemic?*

The sub-questions are:

1. What was the nature of lecturers' pedagogy for ICT integration in the introductory economics course during the Covid-19 pandemic?
2. What motivated economics lecturers' pedagogical choices during the Covid-19 pandemic?
3. How could the quality of the teaching in the introductory economics course during the Covid-19 pandemic be described?
4. What are the competencies lecturers need to teach introductory economics with ICT during ERT?

The main question was broad and invited a descriptive response: since the study employed an interpretivist paradigm which, in its design, emphasised the subjective experiences of participants, this question was appropriate. The first and second sub-questions examined the nature of ICT pedagogy and the reasons for lecturers' pedagogical choices and

addressed the first aim of the study which was to examine how lecturers used ICT in the introductory economics course. The third question considered the quality of teaching and related to the first aim of the study which was to examine how lecturers used ICT to teach introductory economics. Finally, the fourth question posed a question about the competencies required to teach introductory economics with ICT and answered the second aim of the study which was to identify competencies that encourage effective teaching with ICT in introductory economics.

3.5.2 Research goals

According to Maxwell (2013) the purpose of research goals is to steer the researcher's other design decisions to make sure that the study is credible. They are crucial to justify the study. In chapter one, the researcher stated that post-pandemic there is an urgent need to examine how lecturers integrate ICT into their teaching and to identify the competencies required to teach introductory economics. Applying Maxwell's (2013) logic, this goal informed the method of data collection (interviews); it justified the need to conduct the research (need to study lecturers' ICT practice to identify teaching strategies that work) and delineated the available resources for this study (virtual access to the LMS and key participants).

3.5.3 Conceptual framework

One of the elements of Maxwell's model (2013) is the conceptual framework, which he posits is a speculative hypothesis of a phenomena which assists researchers to evaluate and distil their goals, develop appropriate and relevant research questions, choose suitable methods and identify possible validity threats (Maxwell, 2013). Nieuwenhuis (2019) figuratively depicts the conceptual framework as an anchor which identifies the persons to be studied; the key constructs and the possible relationships between them based on logic, theory, or experience. The literature review provided the conceptual framework and it outlined the argument that lecturers' ability to teach with ICT is essential for teaching quality. Furthermore, chapter two identified the persons to be studied (lecturers in the introductory economics course), it defined and operationalised the key constructs (learning and teaching; ICT integration; teaching quality; introductory economics; ERT; competence) and the relationship between them.

3.5.4 Research methods

As mentioned earlier, methods are tools used to conduct research (Nieuwenhuis, 2019) and Maxwell (2013) identifies four elements to consider when planning a study. These include: *a)* the relationship with participants in the study; *b)* the selection of the setting, participants, times and places of data collection, data sources; *c)* data collection methods and *d)* data analysis strategies and techniques. These elements are discussed in turn in the section below.

Relationship with participants in the study

Consistent with the interpretivist tradition, the relationship between researcher and participant is subjective and qualitative researchers do not view this as an impediment, arguing that reality encompasses subjective experiences of the external world. Therefore, the researcher adopts “an intersubjective or interactional epistemological stance” (Terre Blanche & Durrheim, 2006, p. 7) to interpret participants’ understanding of the social world. To illustrate this point, the vignettes included in Appendix A and Appendix B are based on interviews with participants and reflect the researcher’s interpretation of participants’ experience and meaning of ICT integration.

The selection of the setting, participants, times and places of data collection, data sources

The setting of the study

The setting for this study was a traditional institution recognised for its excellence in research, teaching, and community engagement. The institution relied on detailed emergency plans to navigate ERT and the faculty where the study was conducted had recently hired staff to support online teaching and learning in the faculty. The introductory economics course was one of the flagship courses at the institution which catered for more than 900 students from different faculties.

A study of this nature would normally include access to the physical campus, however, due to the restrictions imposed by the Covid-19 pandemic, the researcher was constrained to virtual discussions with two key participants of the lecturing group, and permission was granted for six-month access to the economics course on the LMS. Despite these limitations, the researcher was able to generate rich data that captured the real-life world

of the lecturing group. Therefore, it was possible to develop vivid descriptions of lecturers' experiences and to answer the research questions.

Population and sample

The two main participant interviewees (from the lecturing group of eight lecturers) delivered lectures in macro and micro-economics. The researcher gathered data from the video lectures developed by three additional lecturers and the material was analysed using content analysis. Therefore, the learning material of five of the eight lecturers formed part of the content analysis in this study. Furthermore, the Q&A session and video tutorial/lecture featuring a lesson on the whiteboard (refer Appendix E) were analysed to identify common themes about lecturers' ICT practice. While the researcher would have preferred to interview more participants, it was not possible due to the constraints of ERT and the Covid-19 pandemic. The participants were, however, representative of the larger economics teaching group and the vignettes (refer: Appendix A and B) provide further insights into their experiences of teaching introductory economics during ERT.

Light et al. (1990, as cited in Maxwell, 2013) identifies this type of participant selection as purposeful selection and Maxwell (2013) states it is an approach in which specific people, locations and events are purposively chosen to provide information about the research questions and goals that are not possible anywhere else. Data were generated from: (a) video lectures delivered by five lecturers; (b) course material on the LMS; and (c) documents developed by the lecturing group over a period of several years.

A key idea in research is the unit of analysis which Terre Blanche et al. (2006) define as the thing which is being investigated which is identified by who or what the researcher wants to make inferences about. The unit of analysis was the ICT practice of lecturers responsible for teaching the introductory economics course, and the study described their experiences of teaching with ICT during ERT.

Data collection

The study started in March 2020 and the majority of data were generated in the second semester, 2020. Virtual interviews were conducted with two lecturers in July 2020 and the researcher accessed the course to study the structure and content from July to December 2020. The data captured on spreadsheets and in transcripts were date-stamped.

Documents like the handbooks or exam question and answers that had been developed over several years, were included as data sources. In addition, the new content developed in preparation for ERT included the video lectures and the synchronous Q&A sessions.

Mason (1996) defines data sources as incidents from or through which the researcher believes information can be produced. She argues that generating data is a more accurate term than collecting data because researchers in qualitative research actively construct knowledge about the world and they use methods based on their epistemological stance. The various sources used to generate data are detailed below.

(a) The audio-visual data included two semi-structured interviews, three video lectures, one video tutorial and one exam revision video which totalled approximately two-and-a-half hours of recorded voice and visuals.

(b) The text data included transcripts of the interviews, three video lectures, video tutorial and exam revision video (35 pages). In order to answer the first and second sub-questions concerning the nature of lecturer's ICT pedagogy, it was important to listen to lecturers' accounts of their teaching practice and consequently content analysis was employed to analyse their verbal statements. This data were triangulated with other text data to answer the first two sub-questions. To answer the third sub-question, the researcher relied on analysis of text data as evidence of the quality of lecturers' practice. To provide insight into the fourth sub-question, the researcher assessed the ICT practices of the lecturing team based on Fröm's (2017) definition of digital competence which was discussed in chapter two.

The researcher made summary and observation notes of two Q&A sessions (7 pages) and the two module handbooks (19 A4 pages). This data provided rich information to answer questions about the quality of lecturers' teaching. PowerPoint slide presentations of the key points in two chapters of the prescribed textbook (27 slides), a maths revision kit (27 A4 pages) and a multilingual glossary (116 A4 pages) provided further insight into how lecturers prepared for the move to ERT. These were invaluable sources for understanding the type of support that was available to students and also pointed to the different types of material developed and used by lecturers to deliver the course. The focus on exam preparation and assessment was evident in the array of past question papers, exam instructions, memos to questions and worked solutions (447 pages for both modules,

some material included voice-over). The tutorial programme featured MCQs, some with worked solutions (84 pages for both modules). Finally, the researcher examined the LMS content, activity and structure. Figure 3.1 delineates the different type of data sources.

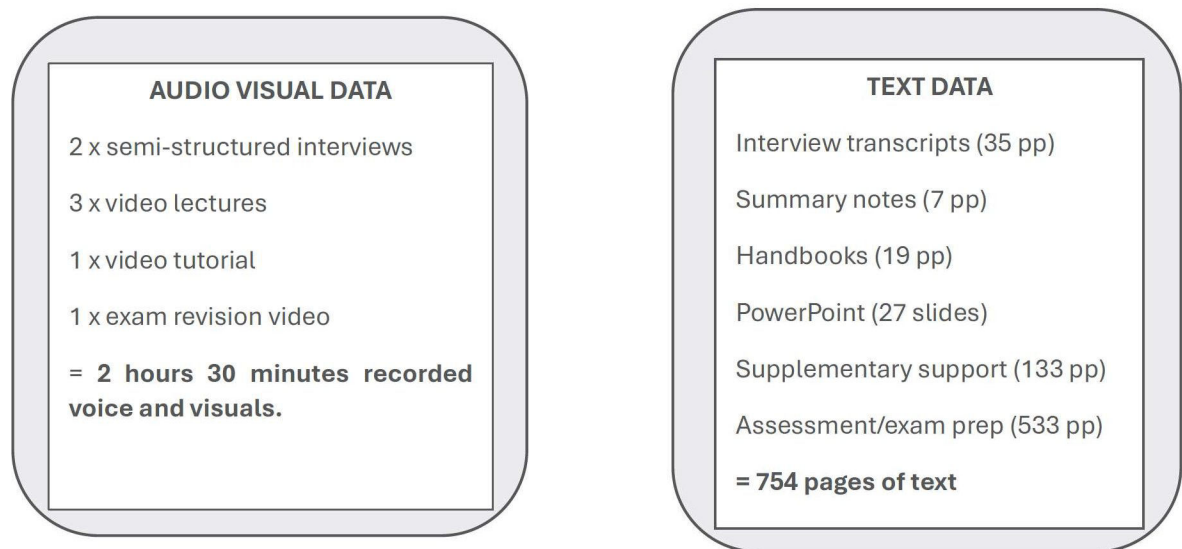


Figure 3.1 List of data sources in this study

In addition to examining the interviews and video lectures, the researcher examined, coded, and analysed the material on the LMS.

To ensure accuracy and credibility or what Creswell (2012) refers to as “validating findings” (Creswell, 2012, p. 259), the data were extensive and varied. Creswell (2012) encourages qualitative researchers to employ triangulation which involves verifying evidence from different data sources and using varied methods of data collection. In line with these recommendations, the data sources included virtual interviews, video lectures, Q&A sessions and several types of learning materials embedded in the course site on the LMS.

The discussion now turns to the individual *data sources*. Creswell (2012) notes that interviews are popular in qualitative research: they enable researchers to ask general, open-ended questions and to record participant responses. Examples of the open-ended questions from this study were: a) “How do you typically use technology in your teaching?” b) “Describe your role in the introductory economics lecturing team” and c)

“What are your perceptions of the value of technology?” (refer: Appendix D for further questions from the interview guide).

The researcher had obtained ethics clearance from the Education Faculty (see Appendix C for ethics clearance number), and permission to conduct the study from the Head of the Department of Economics and the Registrar for the institution. The participants consented to being interviewed, and to having their interviews recorded in Microsoft Teams. Permission was granted for access to the course on the LMS. In preparation for the interviews, the researcher conducted a trial run with a fellow researcher, who suggested improvements to the interview questions. The audio recordings were transcribed by two external transcribers, and the researcher checked the accuracy of the transcriptions against the original recordings.

Data analysis

Nieuwenhuis (2019) notes that qualitative researchers favour inductive data analysis in which themes or key ideas are allowed to emerge from the data. Researchers often adopt an interpretive philosophy which studies the symbolic content of data, and the purpose of data analysis is to determine how participants make meaning of phenomena by analysing their understanding, knowledge, and experiences. This study used a combination of deductive and inductive techniques: themes were identified from the data but also linked to the main theoretical frameworks. Appendix F indicates the process of data analysis the researcher followed.

Seidel’s (1998) model for data analysis as cited in Nieuwenhuis (2019) involves three elements which are interlinked and iterative: (a) noticing, (b) collecting, and (c) reflecting. For example, while reading a transcript (noticing), the researcher may think about the data that has already been gathered (reflecting) and realise that an interesting theme has emerged that requires some clarification which leads the researcher to collect additional data. This process reflects the researcher’s experience of conducting data analysis, and the researcher often went back to review the audio recordings, transcripts, the literature and initial findings and interpretations.

Saldaña (2009) describes coding as an integral part of data analysis. Citing Sipe and Ghiso he argues that coding is “a judgment call” (Sipe & Ghiso, 2004 pp. 482-483) about the data and is therefore an interpretive act. He defines a code as a cumulative pattern of data

which captures the essence of something either in language, audio, or visual format. The main inductive method of data analysis was content analysis and coding was the technique used to identify themes across large data sets of text. For example, through content analysis, transcripts of the interviews and video lectures were coded, patterns were distinguished across individual data and corroborated with other data sources (e.g. the study guide; course handbook, course site announcements). The study also applied the lens of the relevant theoretical frameworks in a deductive way to enhance the analysis of data.

The process of data analysis for one of the interview transcripts in this study is explained below:

1. The audio files from the interview were transcribed by a freelance transcriber and the accuracy compared with the audio files.
2. The researcher read the transcript a few times and highlighted significant data that related to the research questions.
3. The researcher documented initial impressions and questions for further exploration through a reflective journal.
4. The researcher created spreadsheets which were grouped according to data relevant to the research questions. The participant interviews formed the core of the data sources and this data were triangulated by analysing three video lectures (delivered by three different lecturers, not the interviewees), summary notes of the recordings of two Q&A sessions and course documents.
5. In the initial stage of coding, segments of data were coded using descriptive codes (Saldaña, 2009) to summarise the primary topic of a section from the interview.
6. In the second cycle of coding, pattern codes were employed which Miles et al. (2014) describe as codes that identify an emerging theme in an economical way.
7. The same codes were reapplied to similar segments of data (identified with numerals).
8. Following the recommendation of Saldaña (2009), the researcher queried what action participants were involved in, what they were trying to achieve, how they tried to achieve what they were doing, how they described their actions, what assumptions they made, what the researcher thought was going on and what was striking about the interaction.

9. The next phase was to look for connections between categories and sub-categories and identify common themes across the various data.
10. Finally, the categories were related to theoretical ideas, more specifically the key constructs in the TRM and TQF.

3.5.5 Validity and credibility

Validity is a key component of the research design which Maxwell (2013) refers to as the credibility of an account of a phenomenon. Maxwell (2013) states that an important consideration is validity threat which concerns the ways in which a researcher may be wrong. The researcher is encouraged to identify specific threats and to manage them, by for example, asking participants to check the accuracy of the findings. Maxwell (2013) also suggests generating rich data and collecting information from diverse individuals and settings, using varied methods. The main participants were lecturers and their input was supplemented by data from three other lecturers who were part of the lecturing team, as well as learning material developed by lecturers in the economics team as a whole.

Guba (1981, as cited in Nieuwenhuis, 2019) uses the term “trustworthy” to refer to a similar idea as validity. Four criteria for assessing trustworthiness are identified:

1. ***Credibility*** - refers to how believable the findings are.
2. ***Transferability*** - refers to how typical study participants are of the context being studied and if there is congruence between the context of the study and the research findings.
3. ***Dependability*** - assessed through the research design and its implementation; includes the operational detail of data gathering and the researcher’s reflective appraisal of the project.
4. ***Confirmability*** - the degree to which the findings of the study are informed by participants and not the researcher’s motivation or interests (Guba, 1981, pp.143-145).

This study promoted trustworthiness in the following ways, as indicated in Table 3.2.

Table 3.2: Elements of the research design employed to promote trustworthiness in the study

Criteria for trustworthiness	Element of research design
Credibility	Lecturers' experiences of ICT integration are typical of accounts in the literature on ICT integration, ERT, economics education and teaching at tertiary institutions (to be discussed in chapter four).
Transferability	The main participants were responsible for delivering lectures and they were representative of roles in economics departments at other institutions. The research findings were based on the subjective accounts of participants and were congruent with other studies of teaching introductory economics with ICT and studies of teaching during ERT.
Dependability	Refer to the section data sources, data collection and data analysis discussed earlier in this chapter.
Confirmability	Two freelance transcribers transcribed the interviews; the coding spreadsheets detailed the themes that emerged through content analysis.

To summarise this section, Maxwell's (2013) interactive model of research design is applied to the study:

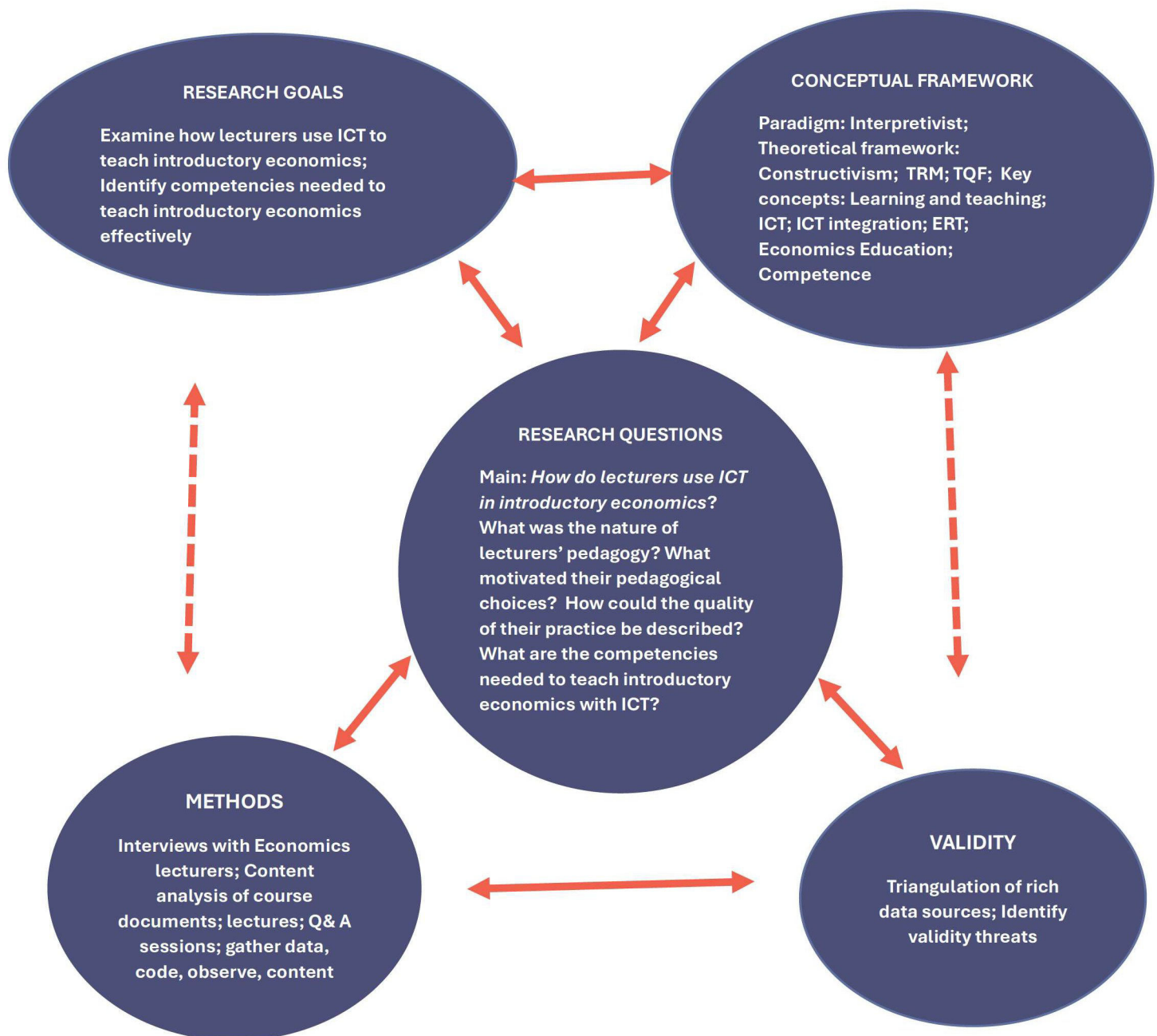


Figure 3.2 Maxwell's (2013) interactive model of the research design applied to this study

Source: Maxwell, 2013, p.5.

3.6 Conclusion

The chapter explained the concept research methodology and showed how the qualitative study discussed in this research report is congruent with the paradigm (interpretivism) and theoretical framework (TRM; TQF). It discussed the research design and demonstrated how it enhanced the coherence of the study through applying Maxwell's (2013) interactive model. A recurring theme in this chapter was coherence and congruence between the various components of the research study.

The next chapter discusses the findings of the study.

CHAPTER 4: FINDINGS OF THE STUDY

4.1 Introduction

The previous chapter discussed the research methodology and emphasised how this empirical qualitative study was congruent with the paradigm (interpretivism) and theoretical framework (TRM and TQF). It discussed the research design and demonstrated how it enhanced the coherence of the study through applying Maxwell's (2013) interactive model.

This chapter presents the findings of the study and attempts to answer the main research question, *How do lecturers use ICT to teach introductory economics during the Covid-19 pandemic*. The chapter is structured according to the four sub-questions of the study and relates the relevant theme(s) which emerged after the data were analysed. The five themes are: (a) lecturers adapted their teaching practice; (b) lecturers developed new practices and competencies; (c) lecturers used existing practices and technologies; (d) lecturers maintained academic standards and continuity of the course and (e) lecturers supported student equity.

In terms of data collection, the researcher coded several data sources which comprised 754 pages of text and two and a half hours of recorded voice and visuals. The data sources, data collection method and data analysis were discussed in detail in chapter three.

4.2 Sub-question one: What was the nature of lecturers' pedagogy for ICT integration in the introductory economics course during the Covid-19 pandemic?

4.2.1 Theme 1: *Lecturers adapted their teaching practice*

All assessments deployed online

Prior to ERT, only the weekly tutorials were deployed online through the Test-and-Quizzes tool in the LMS. Of all the ICT practices, moving all assessments online was the most disruptive. Because of the large student numbers in the introductory economics course, multiple choice questions (MCQs) were used for summative assessment. The question pool had to be increased to ensure questions were sufficiently randomised to prevent cheating.

We had to create a question pool. We had 12 questions and had to generate 100. I had to literally develop a question pool for the test and a question pool for exam. It took me two weeks to create a pool for one test.

Although the institution provided laptops and free data, students experienced challenges with poor network coverage and power outages. Consequently, lecturers had to be flexible and exercise their judgement to assess each student's request for an extension. This resulted in lecturers adapting assessment practices and being increasingly more available to students who had difficulty accessing the learning material. For example, students were given additional time to complete online assessments, and in some cases when they could not access the LMS platform, tests and exam questions were emailed to them.

What we learnt as we went along was that very tight windows for submissions meant that those who had network issues were not finishing on time. So, with each test we increased the window period and we gave more time to complete (the assessments).

In moving all the assessments online, lecturers did their best to ensure the questions were clear and simple to avoid misunderstanding, and they were flexible and accommodating in their approach. For example, the weighting of assessments was revised when lecturers realised that many students' socio-economic backgrounds prevented their full participation in the course.

From face-to-face lectures to video lectures

With the rapid move to ERT, lecturers replaced face-to-face lectures with video lectures. These files in MP4 format varied in format and content and were based on key ideas from the prescribed textbook. The textbook publisher's PowerPoint slides were used as a basis for the video lectures, with lecturers incorporating voice to explain key concepts. The video lectures were developed quickly, as one of the participants pointed out:

We were put on a spot...in a short space of time, we had to put everything we've done online... That required lecturers to make videos for the course.

Videos had to be ready to run with the tutorial programme.

The video lectures were uploaded onto the LMS the week before the lecture was delivered synchronously and students had the option to download the video lecture to access the

material later. Lecturers relied on their existing competencies, teaching strategies, and ideas to develop this resource. For example, one of the participants interpreted the brief in an innovative way and used existing materials to deliver content that demonstrated the relevant economic models graphically.

For me it was a challenge to teach. I used my daughter's whiteboard, and I got a webcam and connected it so students can see what I'm writing. It's not perfect in terms of lighting... Not the best videos and the sound was bad, so I got a microphone.

Before ERT, face-to-face lectures were the main mode of instruction and lecturers developed video lectures to ensure the key ideas and concepts in the curriculum were packaged and made available to students in a format that could be downloaded and accessed asynchronously.

4.2.2 Theme 2: Lecturers developed new practices and competencies

Online Q&A sessions to revise topics and prepare for examinations

A new question and answer (Q&A) practice was introduced to assist students with queries about the previous week's work and this constituted part of the new formative assessment methods. The weekly Q&A sessions were supplemented with revision Q&A sessions in preparation for the exams. Both sessions were conducted synchronously and the recordings were uploaded onto the LMS for students to access at a later stage.

The Q&A sessions were fraught with technical problems which prevented clear communication between lecturers and students. These sessions highlighted the limitations of technology, as is evident in the following quote:

So, despite having the hardware, which is only one aspect of technology, almost every week (we were) inundated with students saying, 'Hi mam, I had difficulty handing in my tut, either because I had electricity issues or the network wasn't so good.' So those challenges still are impediments, in terms of using technology to its full capacity. So (our use of technology) is limited and we've kept it very simple.

In addition, these sessions suggested that students may have experienced difficulty with the subject content but it is not possible to say if this was because the content was difficult, if it was a challenge for lecturers to teach, if technology prevented effective communication of ideas, or if it was a combination of factors. The lecturer who facilitated this session employed different strategies using words, graphs and algebra, to provide feedback within the constraints of poor communication and IT challenges. The Q&A sessions represented an attempt to maintain academic standards and ensure the continuity of the course.

4.2.3 Theme 3: Lecturers used existing practices and technologies

LMS platform and tools

With the onset of ERT, the LMS became the main communication tool and daily announcements, the results of assessments, course schedules, the course handbooks, recordings of Q&A sessions and video lectures were available to students. Lecturers uploaded their video lectures onto the LMS, and they conducted synchronous meetings through Microsoft Teams and other video conference tools via the LMS. As such, the LMS was an essential content repository and delivery mechanism for learning and teaching. The economics lecturing team got on board quickly to implement ERT and they were forced to adapt their teaching practices quickly and to improve their ICT skills in order to ensure successful course delivery.

4.3 Sub-question two: What motivated economic lecturers' pedagogical choices during the Covid-19 pandemic?

4.3.1 Theme 4: Maintaining standards and continuity

The fourth theme concerns the team's attempts to maintain standards and ensure the continuity of the introductory economics course. The concern for maintaining standards is demonstrated in several ways, including (a) efforts to prevent cheating which compromised the integrity of the assessments; (b) ensuring all learning materials were available on the LMS; (c) professional development training provided by the faculty and (d) the lecturing team acquired new ICT skills and knowledge (e.g. learning how to reduce the size of files; recording video lectures; displaying innovation in teaching methods).

Lecturers' concern to ensure the continuity of the course was demonstrated in the following ways: (a) the speed at which new teaching strategies and formats were developed to support ERT; (b) attempts to maintain assessment as a core component by moving all assessments online; (c) finding alternative ways to deliver assessments when synchronous methods weren't available. The following participant quotes capture the concern for maintaining standards and continuity as it relates to conceptions of effective teaching in the introductory economics course:

Your teaching should add additional value that students don't find in the textbook. The whole point is that you're still fulfilling the role of facilitator, so you must facilitate learning.

I don't feel using PowerPoint slides and talking over the slides is the right way of teaching. In that case, they may as well read the textbook. They need to see how the model is built up from scratch and work through it with you.

4.3.2 Theme 5: Lecturers supported student equity

Lecturers understood that the majority of students were from poor backgrounds with limited ICT resources and they responded to student's academic needs by providing fair assessment opportunities. Students were allowed to submit answers via email if they had problems accessing the LMS and students were given extensions to complete their assessments in time without being penalised. Lecturers sat in on the online tests to troubleshoot IT problems and assisted students with queries. Despite the fact that all video lectures and Q&A sessions could be accessed asynchronously, a significant weight-bearing part of the course (i.e. tutorials and examinations) was conducted synchronously. Therefore, despite efforts to ensure students were given a fair and equitable chance to pass the year, many students may have been disadvantaged.

4.4 Sub-question three: How could the quality of the teaching in the introductory economics course during the Covid-19 pandemic be described?

This question relates to the first aim of the study which was to describe the nature of lecturers' ICT integration in the introductory economics course. Quality teaching as it relates to Darling-Hammond's TQF (2021) means that good teachers have knowledge of the subject (content knowledge), they know how to teach the subject (knowledge of

pedagogy), they understand and meet their students' needs, and are able to reflect on and research their teaching practice. Evidence of lecturers responding to students' needs is provided in section 4.3.2 and will not be discussed again.

In terms of *content knowledge*, the video lectures, Q&A sessions, video tutorials and other learning material (e.g. course outline, multilingual glossary, Maths revision kit, exam and test questions) represented the combined knowledge pool of the introductory economics lecturers. Lecturers were challenged to package their content knowledge in a new format (by developing video lectures of the key ideas in economics theory) and the variety of approaches to this challenge revealed their varied perspectives on how to best teach introductory economics. In this regard, the data suggested that lecturers' *knowledge of pedagogy* was varied and individual. For example, of the five economics lecturers whose learning material was analysed, one lecturer integrated interactive graphs in their presentation, all lecturers incorporated voice, one lecturer used little text but incorporated many examples via voice, while another presentation was text-heavy with few examples.

4.5 What are the competencies lecturers need to teach introductory economics with ICT during ERT?

This section of the report elaborates on the second objective of the study which was to identify competencies that promote effective teaching with ICT in introductory economics. Applying Fröm's (2017) concept of digital competence in teaching and learning, evidence of lecturers' competence should be evident in their understanding of what ICT can do and whether they have the requisite skills, knowledge and attitude to teach effectively. In terms of the first aspect, there was evidence that lecturers knew what ICT could do in that they used the LMS tools to develop question pools, to develop and upload video lectures, to post announcements and deploy the assessments online. They also used video-conferencing tools to deliver synchronous Q&A sessions, video tutorials and lectures.

In terms of skills, knowledge and attitude, Table 4.1 outlines evidence of some of the competencies lecturers relied on to teach the introductory economics course.

Table 4.1 Competencies evident in the introductory economics lecturing team

COMPETENCE	EVIDENCE	SELECTED QUOTE
Skill	1. Using physical whiteboard with camera rigged to it to demonstrate economics concepts 2. Generic computer skills that facilitate fast sharing of information 3. Video conferencing skills 4. Tips and techniques for teaching online 5. Knowing how to use the LMS tools to enhance teaching and learning	1. "Some lecturers have made the effort to use the whiteboard or incorporate a lot of examples into their notes." 2. "I never thought I'd ever have to develop skills like how to share a link from my Google Drive straight to the course site. It's now second nature." 3. "Two weeks prior to going online, our head of school organised a MS Teams training because we decided that's the mode we're going to use. Some people were already familiar with Loom and Zoom, so they preferred to do Loom and Zoom." 4. "They encouraged us to use simple tools to develop material: literally voice-over Power Point, don't use tools that use a lot of data. Try to keep your camera off. A lot of the training was about teaching online for the first

COMPETENCE	EVIDENCE	SELECTED QUOTE
		time. The assumption was that none of us were proficient with online.” 5. “There are features of the LMS tools like developing a question pool that I’m now quite comfortable doing.”
Attitude	1. Resilience 2. Flexibility 3. Innovative 4. Be prepared	1. “It takes a lot more effort now to integrate or to replicate what you would do in class.” 2. “We had to create a question pool to generate 100 questions and it took me 2 weeks to create pool for one test.” 3. “For me it was a challenge to teach. I used my daughter’s whiteboard, and I got a webcam and connected it so students can see what I’m writing.” 4. “I would say, plan ahead, if you are going to do online lectures, be very prepared.”
Knowledge	1. Technical knowledge of ICT tools 2. Knowledge of pedagogy	1. “I literally now know how to shrink a video, to keep quality but size the

COMPETENCE	EVIDENCE	SELECTED QUOTE
		video. I have a handbrake tool and I know how to use VLC Media Player to make a video smaller.” 2. “Try and fit in as many examples, try and replicate what you would do in class so fit in as many examples so that you don’t leave students hanging and wondering ‘Well, what was that?... How is this different to me just reading the text.’”

4.6 Conclusion

This chapter presented the findings of the study according to the four sub-questions of the study. It related the relevant study theme(s) to each of the sub-questions in an attempt to answer the central question, *How do lecturers use ICT to teach introductory economics during the Covid-19 pandemic?* The findings show that lecturers adapted their teaching; they developed new practices and competencies and they used existing practices and technologies to maintain academic standards and support students. It also showed that lecturers integrated a range of skills, knowledge and attitudes to teach the introductory economics course.

CHAPTER 5: THE DISCUSSION OF THE FINDINGS

5.1 Introduction

This qualitative study addressed the pedagogical challenge that lecturers in introductory economics do not sufficiently use ICT in their practice (Asarta et al., 2021; Ojo, 2023) and this affects the quality of teaching (Dlamini & Ndzinisa, 2020). Given the expectation that lecturers integrate ICT into teaching (Sciabarrasi, 2023), it is crucial to understand how they use ICT to teach. The main research question was: *How do lecturers use ICTs to teach introductory economics during the Covid-19 pandemic?* The study data were analysed through content analysis and the theoretical lens of Kopcha et al.'s TRM (2020) and Darling-Hammond's TQF (2021) and highlighted five themes about lecturers' ICT practice.

The chapter discusses the findings presented in chapter four according to the five themes. It discusses the quality of teaching of the economics team and the type of competencies required to teach introductory economics as delineated in the previous chapter. Selected studies in economics education, ICT integration and ERT are revisited to show how the literature either supports or refutes the findings.

5.2 Discussion of the major themes of the study

The main themes concerned the nature of lecturers' ICT pedagogy and motivation for them adopting particular pedagogies. The data suggested that lecturers' ICT decisions reflected a range of responses to the challenges of ERT and that they adapted existing teaching practices, they developed new practices and skills, and they used existing practices and technologies to teach the introductory economics course. The data showed how lecturers' determination to maintain the continuity and academic standards affected their practice and how their response to students' needs revealed their support for student equity.

5.2.1 Theme 1: Lecturers adapted their teaching practices

All assessments deployed online

Deploying all assessments online raised questions about how to manage the integrity of assessments. It also raised concerns about disadvantaging students who were genuinely

experiencing challenges accessing the LMS. The following quotation describes the dilemma that faced the lecturing team:

It was the first time we ever even ventured or navigated an online test so... there was an option to leave it as a sort of take-home assessment but the nature of our course, as in multiple-choice, would never have allowed that because we would just have widespread copying and we did have an incident of copying...we tried to find (a strategy) that was balanced enough to allow students sufficient time to submit but also to prevent cheating and so we kind of tried to find something that would work across the school.

The rationale for using MCQs was based on the fact that the student enrolment for the introductory economics course was large and MCQs are a convenient and quick way to assess students. However, the main participants experienced increased workload since they had to generate additional test items to enable randomisation of questions.

The assessment process was time consuming and while moving the assessment online was an attempt to ensure the continuity of the course, it may be prudent for the lecturing team to find additional assessment types and modes which could be equally efficacious.

The focus on assessment in the introductory economics course is evident in the learning materials uploaded onto the LMS. Figure 3.1 shows that 533 of the 754 pages of text data concerned assessment. These resources included past test and exam papers and memos, as well as tutorial questions to help students with practice. One of the themes in Ojo's (2016) study was the teaching staff's concern for fulfilling the requirements of the curriculum so that students can pass. The findings of this study are therefore supported by Ojo's (2016) study. One of Ojo's (2023) recommendations with respect to assessment is that "it is necessary to place a greater emphasis on a cumulative approach to assessing learning through constant feedback, particularly in the digital environment." (Ojo, 2023, p. 123). This recommendation may be worth exploring since the lecturing team could use technology in ways that support an effective assessment strategy for the future.

To illustrate how suitable a theoretical framework the TRM is for the purpose of this study, an element of the first theme will be applied to the framework. Table 5.1 details

each element of the model and relates the decision to deploy all assessments through the Quiz-and-Test tool on the LMS.

Table 5.1: Application of the TRM to the decision to deploy all assessments online

Element of the TRM	Application: Deploying assessments online via LMS	Comment
What is best for me and my students in terms of assessment and how can technology help me?	It is best for my students that the assessment program is maintained so that the year isn't lost. How can technology assist me with delivery assessments online during ERT?	ICT integration is value-driven
Possible technology use	The Quiz-and-Test tool has the functionality to manage online assessments.	ICT integration is affected by lecturers' perceptions of technology and its use.
Lecturers' beliefs, knowledge and experience	Belief: Since the Quiz-and-Test tool was used successfully before the pandemic to deploy tutorials online, it must be suitable to use for other assessments. Experience: Students cheating. Knowledge: How to use the LMS tool; when to load content; select and upload test items.	The beliefs are influenced by lecturers' views on the possible use of technology.
Perception of teaching and learning context	Given the instance of cheating, perhaps the Quiz-and-Test tool isn't a suitable and secure means to conduct assessments. It is important to protect the integrity	Threat to academic integrity. Need to protect academic standards and

Element of the TRM	Application: Deploying assessments online via LMS	Comment
	of assessment and it seems that students are taking advantage of the ERT environment.	continuity of the course.
Evaluation of decision	Continue to use the tool, but reduce time to submit exam from 12 to 3 hours.	Lecturers did not have many options available.
Actual technology use	Students have 3 hours to complete assessment.	Reduce time to complete assessment but continue with the format.

From face-to-face lectures to video lectures

As mentioned in chapter four, lecturers were forced to find an alternative to face-to-face lectures and they developed video lectures as the main teaching method. Since many students experienced challenges with access, loadshedding, network issues and other IT issues, video lectures were an appropriate solution because students could download them at a later stage. However, some of the video lectures were presented in transmission instructional ways with limited integration of novel and local examples to which students at that particular institution could better relate.

The faculty's teaching and learning support staff provided best practice guidelines for development of video lectures, and lecturers were advised to develop material that did not consume excessive data, to extract the key points of the lesson and to find simple, yet effective ways to communicate key ideas. These suggestions were sufficient for the short term of ERT, and it would be unrealistic to expect the lecturing team to have acquired the necessary instructional design skills to develop pedagogically sound learning materials. As Hodges et al. (2020) noted: ERT was "a temporary shift of instruction to an alternate delivery mode due to crisis circumstances." (Hodges et al., 2020, paragraph. 13).

To a large extent the video lectures demonstrated the expertise of the team in terms of knowledge of content and other indications of their content knowledge can be seen in the variety of learning material developed for ERT and over the course of several years (e.g. Maths kit; multilingual glossary; tutorials; test and exam banks and so forth).

Of the five videos which were analysed, one differed in content and format. Developed by one of the participants in the study, it explained the concepts possibilities, preferences and choices (refer Appendix E). It was recorded on 31 March 2020 and this suggests the lecturer took the initiative to do something different early on in ERT. The lecturer used a hand-held microphone to introduce the lesson and explained key ideas using a whiteboard which had a webcam attached to it. Calculations were done on the whiteboard with a coloured marker and the graphs were erased whenever a new shift in the model was introduced. The original equation was written on the left-hand side of the board as the model developed. The lecturer did not believe that voice-over PowerPoint was the correct way to teach and so their teaching strategy was different. This demonstrates a constructivist approach to teaching and an understanding of the importance of helping students conceptualise and apply economic theory (Picault, 2019).

5.2.2 Theme 2: Lecturers developed new practices and competencies

Online Q&A sessions to revise concepts and prepare for examinations

The online Q&A sessions provided an opportunity for formative assessment and these sessions showed the difficulty of providing meaningful feedback to students. These sessions also highlighted students' struggle to comprehend concepts, and showed how technical difficulties constrained communication and limited facilitation of teaching and learning. It also demonstrated the lecturing teams' commitment to maintaining standards and ensuring the continuity of course.

The Q&A sessions which aimed to answer students' queries about the previous weeks' work is an example of how the team developed a new practice during ERT. Since face-to-face sessions were not possible, the weekly Q &A sessions were introduced to support students via synchronous meetings that were recorded and could be downloaded at a later stage. This strategy was a creative attempt to mediate, promote and enhance student learning.

5.2.3 Theme 3: Lecturers used existing practices and technologies

LMS platform and tools

The LMS platform became the default communication and course management system during ERT and lecturers were tasked with preparing lecture material in advance to enable students to download the material before the synchronous lesson was conducted. This raised the question as to whether the lecturing team had the necessary IT resources at home to support online learning and teaching. For example, one of the participants commented on the additional cost involved in upgrading the infrastructure at their home to enable them to continue with their professional duties as a lecturer. These were significant challenges which impacted lecturers' teaching practice.

5.2.4 Theme 4: Maintaining standards and continuity

The theme of maintaining academic standards is prevalent in the data and it relates to notions of teaching quality. In the context of HE institutions, according to Darling-Hammond (2021), one of the hallmarks of teaching quality is the extent to which lecturers possess knowledge of *content*, *pedagogy* and *students*. In terms of content knowledge, based on the volume and variety of material developed to provide support for student learning, the team was prepared. Learning material included video lectures, Q&A sessions, video tutorials, and other student support material (e.g. course outline, multilingual glossary, maths revision kit, exam and test questions).

These findings correspond to Ojo's (2016) conclusions about the importance the teaching team ascribed to conveying content to students in an introductory economics course. Ojo (2016) argued that the theme of "having a thorough knowledge of the content" (Ojo, 2016, p. 66) reflected a teacher-centred approach, and he used Maton's notion of segmented learning, which refers to learning where "new ideas or skills are accumulated alongside, rather than building on, past knowledge." (Maton, 2009, p.44). This means that knowledge does not transfer from one context to another and students are not able to apply their understanding of economic constructs in a meaningful way. However, given the context of ERT, one cannot adopt the same assessment, and in fact, in this instance, it was a valuable attribute for the team to possess since it enabled them to share content knowledge with students to maintain standards and the continuity of the course.

As mentioned in the previous chapter, lecturers were challenged to package their content knowledge in a new format (i.e. video lectures) and the variety of approaches to this challenge revealed their varied perspectives on how to teach introductory economics. In this regard, the data suggested that lecturers' *knowledge of pedagogy* was uneven and in some cases featured transmission modes. For example, some of the video lectures featured heavy text with limited application. This may indicate that lecturers need to develop their pedagogical knowledge of how ICT can support learning more effectively.

In terms of the two main participants' approach to pedagogy, Participant A saw themselves as facilitating learning, as reflected in the following quote from the Microsoft Teams interview:

The whole point is that you're still fulfilling the role of facilitator, so you have to still be facilitating learning, even in an online setting. You have to ask yourself 'If I present myself to these students in front of the class what would their issues be, what would they not understand in this chapter, what do I need to focus on?'

While Participant B was not as verbal about their pedagogy, they demonstrated an approach to constructivist teaching and used active teaching methods to demonstrate relationships between economic variables. They were innovative in their teaching strategy and rigged up a teaching environment using a whiteboard, web camera and microphone to deliver interactive lessons which aimed to explain economics concepts.

Participant A pointed out the unique challenges in teaching economics and this quote from the Microsoft Teams interview points to the challenges of ERT and teaching economics with ICT, as well as the potential need for professional development in the team:

If you have a course that's highly mathematical or uses a lot of equations, it's very hard to build that up with students from scratch if they're not in front of you, if that makes sense. If everything is pre-loaded on a slide, all you can do is speak through it, whereas with [classroom] contact you literally build it up with them step by step. So that aspect of the course is slightly lost, unless you're very proficient and you know how to share a

whiteboard and you know, swop between whiteboard and Power Point.
And very few lecturers can do that effectively.

It is interesting to note that both study participants mentioned that teaching should encompass more than just referring students to the textbook and that they perceived their role to be that of facilitating learning. Despite the difficulties of communicating with and engaging students, the two main participants continued to see the value of their teaching.

The idea of maintaining the continuity of introductory economics was referenced in earlier themes (*Lecturers adapted their teaching practice, Lecturers developed new practices*) and will not be discussed here to avoid repetition.

5.2.5 Theme 5: Lecturers supported student equity

The ideas about supporting student equity relate to lecturers' responsibility to students to address their academic, social and emotional needs (Darling-Hammond, 2021). According to Darling-Hammond (2021), good lecturers know their students and respond to their academic, social and emotional needs. This idea is reflected in the theme: "Lecturers support student equity" which refers to efforts to acknowledge the challenges of students' socio-economic environment.

While ERT resulted in additional workload for the participants, they understood that many students experienced limited resources and that this affected their academic performance. Notions of social justice and the need for equity among students were evident in the way in which students were accommodated, and in the effort to make learning material available asynchronously. The following extracts summarise the participants' views of the importance of recognising student equity:

Much of our sessions had to take into account that not everyone would be able to access the site in a live session... Our lectures were just pre-recorded lectures, minimising time, in terms of size and quantity, to make it accessible and downloadable for students to... do on their own...although we're now using the site a lot more, the only time they are active on the site is when they were, either...downloading the videos and watching offline or, the time that they were most active was during the tests and the assessments.

The ideal future for teaching with technology would consider the poorer students. The future needs to be accessing the poorest, where they are not compromised....We cannot ignore technology. Technology disrupts privileged students, but it doesn't affect them as seriously as disadvantaged students.

These quotes suggest that both participants were acutely aware of students' social and emotional needs, and while they may not have been able to respond to, or meet all students' academic needs, the quality of their teaching was evident.

5.2.6 How could the quality of the teaching in the introductory economics course during the Covid-19 pandemic be described?

As mentioned in the previous chapter, lecturers possessed a vast bank of content knowledge in undergraduate economics as evidenced by the variety and amount of learning material developed for ERT (e.g. video lectures, Q&A sessions) and over the course of several years (Maths revision kit, glossary, test and exam banks, tutorials). Therefore, in terms of content knowledge, the quality of their teaching was of a high standard. In terms of understanding and meeting students' needs (academic, social, emotional), the lecturing team displayed empathy for the difficult social and emotional pressures students faced and they adapted their assessment methods to ensure their students' academic needs were met. While their knowledge of pedagogy was varied and individual (as evidenced in the video lectures) and at times favoured transmission modes of teaching, it represented the lecturing teams' best efforts to work within the confines of a challenging teaching and learning environment.

5.2.7 What competencies are needed to teach introductory economics effectively with ICT?

As mentioned in the previous chapter, Fröm's (2017) concept of digital competence is evident in that lecturers understood what ICT could do because they used the LMS tools to develop question pools, to develop and upload video lectures, to post announcements and deploy the assessments online. They also used video-conferencing tools to deliver synchronous Q&A sessions, video tutorials and lectures. The lecturing team was fortunate to have the support of learning and teaching support staff who assisted them with best practice and guidelines for ICT integration, and therefore one could say that the lecturing

team possessed knowledge of what ICT could offer them in order for them to perform their professional duties.

There was evidence of technical knowledge of ICT tools and the two key participants displayed knowledge of pedagogy in that they realised that their role was to enhance, guide and mediate learning. Some lecturers may have struggled to help students conceptualise and apply economic theory as suggested by some of the video material.

In terms of the skill component, there was evidence of generic computer skills, video conferencing skills and other techniques for teaching online. The lecturing team also received support in the faculty and they adapted their practice according to best practice guidelines. Moreover, the majority of lecturers knew how to use the LMS tools and this suggests that the level of skill was sufficient to enable ICT integration given the fact that ERT was an emergency response in a crisis situation (Hodges et al., 2020).

In terms of adopting positive attitudes to manage the change associated with ERT, the participants in the study displayed resilience, flexibility and innovation in their approach to teaching in the context of a challenging teaching and learning environment. Resilience was evident in that several strategies were adopted to support teaching and learning and it was an essential attribute because it enabled the team to complete the academic year. Flexibility was crucial to enable the team to make the necessary changes to assessment so that students were not disadvantaged. Finally, participants expressed that an attitude of preparedness for teaching and assessment was essential: despite the increased workload, their uncertainty and inexperience with online teaching, the team were dedicated to the task of maintaining standards and the continuity of the course.

5.3 Relationship of results to existing studies on economics education and ERT

5.3.1 Emergency remote teaching

The CHE (2021) report which examined the challenges faced by lecturers during ERT at public institutions of HE in 2020 identified the following themes which resonate with this study:

1. Lecturers experienced increased workloads (see comments from participants regarding the time involved to increase the test bank).

2. Lecturers were concerned about student's ability to participate in studies (both participants raised this concern).
3. Lecturers were concerned about the quality and integrity of learning (see the team's response to ensure the academic year continued).
4. They developed new skills and displayed creativity in their teaching practice (evident in the development of video lectures, Q&A sessions and other novel material that was introduced into teaching practice).

Dlamini and Ndzinisa (2020) note that lecturers were “thrown into the deep end without proper instruction on instructional design principles for remote teaching and online learning” (Dlamini & Ndzinisa, 2020, p. 57) and their study demonstrates how the large majority of students were marginalised because of the institution's reliance on teaching through the LMS. Similarly, one of the participants interviewed described the move to ERT as a “systems shock” and both interviewees communicated their concern that many students were unable to access the online assessments deployed on the LMS. As a general comment, it would be important for the lecturing team to consider how they manage the threat of burn-out as lecturers during this period became increasingly available to students and may have neglected their personal and professional needs.

5.3.2 Literature on economics education

In chapter two, the researcher cited a study in which Asarta et. al (2021), indicated that presentation by lectures remains the dominant form of instruction in introductory economics. In this study, this was the main mode of instruction, even though the format was different. It is difficult to imagine another teaching method that could have been used, and given the restrictions imposed by ERT, the team did well to ensure the continuity of the course by adapting their teaching practice to the best of their ability. The learning material proved a valuable resource because it enabled the lecturing team to ensure the continuity of the course.

5.4 Conclusion

This chapter presented the findings of the study: it delineated how lecturers' ICT practices reflected their ability to adapt existing teaching practices and strategies, how they developed new practices and competencies, and how they used existing technologies and

practices to ensure the continuity of the course. Despite the challenges presented by ERT, they were determined to maintain academic standards and to support equity for their students. However, lecturers' teaching practices were, at times, hampered by the limitations of technology; their lack of pedagogical skills and the socio-economic constraints their students experienced.

CHAPTER 6: CONCLUDING REMARKS

6.1 Introduction

The previous chapter discussed the findings by examining the five main themes and discussing the quality of teaching and the type of competencies required to teach introductory economics. Selected studies in economics education, ICT integration and ERT mentioned in the literature review were revisited to show how the literature either supported or refuted the findings. This final chapter concludes the research report by summarising the key points of the study, highlighting its limitations, outlining the implications for teaching practice and suggesting topics for further research.

6.2 Summary of the study

This empirical study examined the teaching of introductory economics with ICT at an urban university in SA during the Covid-19 pandemic. Its purpose was to examine how lecturers used ICT to teach and to identify competencies needed to teach introductory economics with ICT. The central question posed was *How do lecturers use ICT to teach introductory economics during the Covid-19 pandemic?* This question was interrogated through the following sub-questions:

1. What was the nature of lecturers' pedagogy for ICT integration in the introductory economics course during the Covid-19 pandemic?
2. What motivated economic lecturers' pedagogical choices during the Covid-19 pandemic?
3. How could the quality of the teaching in the introductory economics course during the Covid-19 pandemic be described?
4. What competencies are needed to teach introductory economics with ICT during ERT?

This qualitative study adopted an interpretivist paradigm to examine the nature of lecturers' pedagogy for ICT integration and it collected rich data in the form of interviews and learning materials in text and audio-visual format. The individual data sources were coded and content analysis was employed to reveal five main themes which described lecturers' ICT practices, namely: (a) lecturers adapted their teaching practices; (b) lecturers developed new practices and competencies; (c) lecturers used existing practices

and technologies; *(d)* lecturers strove to maintain the academic standards and continuity of the course and *(e)* lecturers supported student equity. In addition to content analysis, the data were analysed through the perspectives of Kopcha's TRM (2020) and Darling-Hammond's TQF (2021). Its main findings were that despite the fact that the majority of lecturers were not experienced with online teaching, they displayed flexibility, innovation and commitment to the academic project by utilising ICT to facilitate learning and teaching to the best of their ability during the challenging conditions of ERT.

6.3 Limitations of the study

Despite the researcher's efforts to ensure the study was sufficiently robust in terms of its conceptual, theoretical and conceptual premise, there are several factors – within and beyond the researchers control – which resulted in limitations of the study. These are discussed below:

1. Lockdown measures imposed by the Covid-19 pandemic meant the researcher could not interview participants face-to-face and had to rely on Microsoft Teams. Consequently, the researcher may have missed non-verbal and contextual cues which could have provided deeper insights.
2. Additional participant interviews (two virtual interviews were possible) may have produced a broader view of the issues and a deeper understanding of ICT integration practices in the group. On the positive side, the researcher was able to generate a large amount of rich data (754 pages of text and two and half hours of audio-visual material) and this could counteract the limited sample.
3. Observation of lectures was part of the original plan, but the researcher had to forgo this because there were no contact lectures. Instead, the researcher received permission to access the LMS platform.
4. The researcher studied the LMS platform as an observer for a period of six months and while this may be considered a short period of time, the variety of data sources and the type and depth of analysis applied to the data made up for the brevity of the observation period.
5. The study drew on insights from two theoretical frameworks and this approach was adopted because the researcher could not find one framework to address the main aims of the research. In future it may be advisable to find one robust

theoretical framework and reduce the research aims to one in order to develop a deeper understanding of the ICT pedagogical issues in introductory economics. On the other hand, the study provided an opportunity to apply two relatively new frameworks in the discourse on ICT integration to introductory economics.

6. The literature review was not as extensive as the researcher would have preferred and this was largely because there are few studies in SA on teaching with ICT in economics at tertiary level. Therefore, the researcher relied on the limited available literature in the local context and the majority of studies were from international studies. This limitation is mitigated in the sense that curricula for introductory economics are similar across the globe.

6.4 Implications for practice

The themes identified in this study suggest that successful ICT integration means being aware that students' socio-economic background limits their performance. Lecturers therefore need to accommodate students' needs by adapting teaching strategies; by being flexible; and by thinking of creative ways to deliver assessments and content asynchronously.

Successful ICT integration also means that teaching a subject like economics requires technical skills that enable lecturers to demonstrate economic principles and models visually. Professional development should include both how and what ICT tools to use as well as an understanding of how ICT can be used to enhance, mediate and guide student learning.

Some lecturers realised that existing tools could be used in different ways to simulate the benefits of face-to-face teaching and there was an awareness that technical ICT skills needed to be developed to cope with the changing learning environment. An awareness of several discontinuities - no contact lectures and assessments, no face-to-face consultations and limited access to learning materials following lockdown - resulted in the lecturing team adopting several measures to ensure the continuity of the course and maintaining standards. For example, they simplified the questions in assessments and attempted to communicate clearly during synchronous sessions. This emphasises the need for clear, simple communication skills to facilitate the teaching and learning process.

Participants in the study pointed out the importance of planning ahead, and the challenges and limitations of technology to provide clear, uninterrupted synchronous learning and teaching. Lecturers therefore need to consider innovative ways to further improve asynchronous teaching and think about using different teaching method that mitigate the challenges of interruptions caused by technological failure. IT support staff should work closely with lecturers to ensure that interruptions are limited and by providing support when it is needed.

Professional development courses specifically designed for teaching introductory economics with ICT would be beneficial to improve the lecturing team's pedagogical competencies.

6.5 Suggestions for further research

Below are some suggestions for further research on ICT integration in the discipline of economics:

1. With the move to ERT, the team felt compelled to continue with the current form of assessment (MCQs), and simply moved everything online. This adapted practice proved to be the most disruptive for the team. Further research on assessment in economics in general, alternate forms of assessment in economics, and online assessment in particular, may be useful.
2. A study exploring economics lecturers' practice utilising the established ICT integration framework, Technological Pedagogical and Content Knowledge (Mishra and Koehler, 2009) could provide further insights into the type of knowledge that is needed for teaching undergraduate economics.
3. Research on student-oriented strategies to support learning would be useful for the professional development of lecturers in economics education.
4. A recurring theme in the data was lecturers' concern that students' socio-economic conditions prevented their full participation. Further studies on how social conditions affect teaching and learning may be beneficial.
5. Given the dearth of research in ICTs in economics education in SA, there is a dire need for studies to be conducted in this area. Some ideas for future research based on critical commentary of this research report include: *a)* the benefit of using particular ICTs to teach undergraduate economics; *b)* identifying competencies

that facilitate teaching with ICT in undergraduate economics; *c)* what is involved in reskilling economics lecturers to improve their practice; *d)* how to motivate adoption of technology, and *(e)* how to measure the effectiveness of employing technology.

6.6 Conclusion

This qualitative study examined the ICT practices of lecturers in an introductory economics course at an urban university in South Africa during the Covid-19 pandemic. It argued that lecturers' ability to teach with ICT is an essential component for teaching quality in the 21st century. The purpose of the study was to examine how lecturers used ICT to teach the introductory economics course and to highlight the competencies needed to teach the course with ICT.

The study recommended that lecturers continue to accommodate students' needs by adapting teaching practices, by being flexible and thinking of creative ways to deliver assessment and content asynchronously. It also encouraged lecturers to develop the technical skills to enhance their teaching of economics and recommended that IT support sufficiently assist lecturers to enable them to continue with lecturing. In addition, the institution could consider developing tailor-made, subject-specific professional development courses to develop lecturers' pedagogical competencies to enable them to teach introductory economics more effectively with ICT.

In closing, the findings indicate that despite the challenges of ERT, lecturers adapted their teaching practices and developed new practices and competencies to support teaching and learning. They used existing practices and technologies to maintain the continuity of the course and to uphold academic standards. They displayed commitment to supporting student equity and responded to students' academic, social and emotional needs. Finally, the quality of teaching was commendable given the difficult circumstances of ERT and the team employed a variety of skills, knowledge and attitudes to facilitate learning and teaching in the introductory economics course.

REFERENCES

- Adu, E. (2023). Economics teachers' content knowledge and teaching strategies used to teach economics in selected South African schools. *Journal of Curriculum and Teaching*, 12(4), 1-8.
- Ali, W. (2020). Online and Remote Learning in Higher Education Institutes: A Necessity in light of COVID-19 Pandemic. *Higher Education Studies*, 10(3), 1-10.
- Allgood, S. & McGoldrick, K. (2023). Teaching before and during COVID-19: A survey. *The Journal of Economic Education*, 54(2), 184-190.
- Arnold, I. (2022). Online proctored assessment during COVID-19: Has cheating increased? *The Journal of Economic Education*, 53(4), 277-295.
- Asarta, C., Chambers, R. & Harter, C. (2021). Teaching Methods in Undergraduate Introductory Economics Courses: Results From a Sixth National Quinquennial Survey. *The American Economist*, 66(1), 18-28.
- Bada, S. & Olusegun, S. (2015). Constructivist Learning Theory: A paradigm for teaching and learning. *Journal of Research & Method in Education*, 5(6), 66-70.
- Bates, A.W. (2019). Why university lecturers need a certificate. *University World News*, 30 November 2019. Available at <https://www.universityworldnews.com/post.php?story=2019112809050642> accessed 6 March 2023.
- Bates, A.W. (2022). *Teaching in a digital age: Guidelines for designing teaching and learning* (3rd ed.). Tony Bates Associates Ltd.
<https://pressbooks.bccampus.ca/teachinginadigitalagev3m/>
- Bates, A.W. (2021). A review of online learning in 2021. *Online learning and distance education resources*. Accessed 4 February 2024. <https://www.tonybates.ca/2021/12/10/a-review-of-online-learning-in-2021/>
- Becker, W., Highsmith, R., Kennedy, P. & Walstad, W. (1991). An Agenda for Research on Economic Education in Colleges and Universities. *American Economic Review*, 81(2), 26-31.
- Becker, W. (2000). Teaching economics in the 21st century. *Journal of Economics Perspectives*, 14(1), 109-119.
- Becker, W. (2001). Economic Education. *International Encyclopedia of the Social and Behavioural Sciences*, 4078- 4084.
- Beetham, H. & Sharpe, R. (2020). *Rethinking Pedagogy for a digital age* (3rd ed.). Routledge.

- Blömeke, S., Olsen, R.V., Suhl, U. (2016). Relation of Student Achievement to the Quality of Their Teachers and Instructional Quality. In: T. Nilsen & J. Gustafsson (Eds). *Teacher Quality, Instructional Quality and Student Outcomes*. IEA Research for Education, Volume 2. Springer.
- Bozkurt, A., Jung, I., Xiao, J., Vladimirsch, V., Schuwer, R., Egorov, G., Lambert, S., Al-Freih, M., Pete, J., Olcott, D., Rhodes, V., Aranciaga, I., Bali, M., Alvarez, A., Roberts, J., Pazurek, A., Raffaghelli, J., Panagiotou, N., Coëtlogon,...Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 Pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1), 1-126.
- Buehl, M. & Beck, J. (2015). The relationship between teachers' belief and teachers' practice. In H. Fives & M. Gill (Eds.). *The international handbook for research on teachers' beliefs*. Routledge.
- Burns, R. (2020). A COVID-19 panacea in digital technologies? Challenges for democracy and higher education. *Dialogues in Human Geography*, 10(2), 246-249.
- Cohen, L., Manion, L. & Morrison, K. (2001). *Research methods in education* (2nd ed.) Routledge Falmer.
- Coleman, E. & Mtshazi, S. (2017). Factors affecting the use and non-use of Learning Management Systems by academic staff. *South African Computer Journal*, 29(3), 31-63.
- Conole, G. & Dyke, M. (2004). What are the affordances of information and communication technologies? *Research in Learning Technology*, 12(2), 113-124.
- Council on Higher Education. (2021). CHE-USAF-UFS staff experience of, and perspectives on teaching and learning and its future (SEP-TLF) survey report.
Available at <https://www.che.ac.za/news-and-announcements/staff-experience-and-perspectives-teaching-and-learning-and-its-future>
- Cuban, L., Kirkpatrick, H., Peck, C. (2001). High Access and Low Use of Technologies in High School Classrooms: Explaining an Apparent Paradox. *American Educational Research Journal*, 38(4), 813-834.
- Creswell, J. (2012). *Educational research: planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.
- Czerniewicz, L., Agherdien, N., Badenhorst, J., Belluigi, D., Chambers, T., Chili, M.,... & Wissing, G. (2020). A Wake-Up Call: Equity, Inequality and Covid-19 Emergency Remote Teaching and Learning. *Postdigital Science and Education*, (2), 946-967.

- Darling-Hammond, L. (2006). Constructing 21st Century Teacher Education. *The Journal of Teacher Education*, (57), 1-15.
- Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B. & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97-140.
- Darling-Hammond, L. (2021). Defining teaching quality around the world. *European Journal of Teacher Education*, 44(3), 295-308.
- Department of Higher Education and Training. (2018). A National Framework for Enhancing Academics as University Teachers. Available at: https://heltasa.org.za/wp-content/uploads/2020/08/National-Framework-for-Enhancing-Academics-as-University-Teachers_signed.pdf
- Depro, B. (2022). Making introductory economics more relevant: Using personalized connections to introduce environmental economics. *International Review of Economics Education*, 39,1-11.
- Dewa, A. (2022). Microsoft Excel: A promising tool for teaching basic descriptive statistics in initial teacher-training institutions. In J. Makonye & N. Ndlovu. *Innovations in online teaching and learning: Case studies for teacher educators from South Africa during the Covid-19 era*, 191-207. Oasis Publishing.
- Dewa, A. & Ndlovu, N. (2022). Use of information and communication technologies in mathematics education lecturers: Implications for preservice teachers. *Journal of Transdisciplinary Research in Southern Africa*, 18(1), 1-8.
- Dlamini, R. & Mbatha, K. (2018). The discourse on ICT teacher professional development needs: The case of a South African teachers' union. *International Journal of Education and Development using Information and Communication Technology*, 14(2), 17-37.
- Dlamini, R. & Ndzinisa, N. (2020). Universities trailing behind: Unquestioned epistemological foundations constraining the transition to online instructional delivery and learning. *South African Journal of Higher Education*, 34(6), 52-64.
- Engelhardt, B., Johnson, M. & Meder, M. (2021). Learning in the time of Covid-19: Some preliminary findings. *International Review of Economics Education*, 37, 1-26.
- Ertmer, P. (2005). Teacher Pedagogical Beliefs: The Final Frontier in Our Quest for Technology Integration? *Educational Technology Research & Development*, 53(4), 25 - 39.

- Ertmer, P., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E. & Sendurur, P. (2012). Teacher Beliefs and Technology Integration: A Critical Relationship. *Computers and Education*, (59), 423-435.
- Ertmer, P., Ottenbreit-Leftwich, A. & Tondeur, J. (2015). Teacher beliefs and uses of technology to support 21st century teaching and learning. In H. Fives & M. Gill (Eds.). *The international handbook for research on teachers' beliefs*. Routledge.
- Ertmer, P. & Ottenbreit-Leftwich, A. (2010). Teacher Technology Change: How Knowledge, Beliefs, and Culture Intersect. *Journal of Research on Technology in Education*, 42(3), 255-284.
- Fives, H., Lacatena, N. & Gerard, L. (2015). Teachers' beliefs about teaching (and learning). In H. Fives & M. Gill (Eds.). *The international handbook for research on teachers' beliefs*, 249-265. Routledge.
- Fröm, J. (2017). Pedagogical Digital Competence – Between values, knowledge and skills. *Higher Education Studies*, 7(2), 43-50.
- Guba, E. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology Journal*, 29, 75-91.
- Hein, G. (1991). Constructivist Learning Theory. CECA (International Committee of Museum Educators) Conference, Jerusalem Israel, 15-22 October 1991.
- Hesse-Biber, S. & Leavy, P. (2011). *The practice of qualitative research* (2nd ed.). Sage Publications, Inc.
- Hodges, C., Moore, S., Lockee, B., Trust, T. & Bond, A. (2020). The difference between emergency remote teaching and online learning. Available at: <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning> accessed 12 February 2023.
- Hoyt, G. & McGoldrick, K. (2019). 50 Years of Economic Instruction in the Journal of Economic Education. *The Journal of Economic Education* 50 (2), 168-195.
- Ifinedo, E. & Kankaanranta, M. (2021). Understanding the influence of context in technology integration from teacher educators' perspective. *Technology, Pedagogy and Education*, 30(2), 201-215.
- Jansen, J. (2018). The future prospects of South African universities: Policy and funding options. Centre for Development and Enterprise. Available at: <https://www.cde.org.za/wp->

content/uploads/2018/06/Viewpoints-The-future-prospects-of-South-African-Universities-Jonathan-Jansen.pdf

- Jansen, J. (2019). Introduction to the Language of Research. In J. Maree. *First Steps in Research* (3rd ed). Van Schaik Publishers.
- Jeannin, L. & Ojo, E. (2021). Culturally responsive differentiated instruction: What lessons for economics lecturers in South Africa? *Transformative Curricula, Pedagogies and Epistemologies: Teaching and Learning in Diverse Higher Education Contexts*, 1-8.
- Johnson, M. & Meder, M. (2024). Twenty-three years of teaching economics with technology. *International Review of Economics Education*, 45, 1-17.
- Kaplan, D. (2018). Piagetian Theory in Online Teacher Education. *Creative Education*, 9, 831-837.
- Koehler, M. & Mishra, P. (2009). What is Technological Pedagogical Content Knowledge? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60-70.
- Kopcha, T., Neumann, K., Offenbreit-Leftwich, A. & Pitman, E. (2020). Process over product: the next evolution for our quest for technology integration. *Education Technology Research Development*, (68), 729-749.
- Koschmann, T. (1996). Paradigm shifts and instructional technology. *CSCL: Theory and Practice of An Emerging Paradigm*. Routledge.
- Knoetze, A. & du Toit, Y. (2022). Emergency remote teaching and learning vs face-to-face: When are students more likely to fall behind? *South African Journal of Higher Education*, 36(5), 157-178.
- Laurillard, D. (2002). *Rethinking university teaching: a conversational framework for the effective use of learning technologies* (2nd ed.). Routledge.
- Lawless, K. & Pellegrino, J. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, 77(4), 575-614.
- Le Grange, L., Maistry, S., Simmonds, S., Visser, A. & Ramrathan, L. (2022). Education in a “neoliberalised” online teaching and learning space: Towards an affirmative ethics. *Transformation in Higher Education* 7(0), a205.
- Light, R. J., Singer, J., & Willet, J. (1990). *By design: Conducting research on higher education*. Harvard University Press.

- Luiz, J. (2009). Evaluating the performance of South African Economics Departments. *South African Journal of Economics*, 77(4), 591-602.
- Makonye, J. & Ndlovu, N. (2022). *Innovations in online teaching and Learning: Case studies of teacher educators from South Africa during the Covid-19 era*. (p. v Research Justification). Oasis Publishing.
- Maphalala, M. & Adigun, O. (2021). Academics' experiences of implementing elearning in a South African higher education institution. *International Journal of Higher Education*, 10(1), 1-13.
- Maphalala, M. & Ajani, O. (2023). The Covid-19 pandemic: shifting from conventional classroom learning to online learning in South Africa's higher education. *International Journal of innovative technologies in Social Science*, 2(38), 1-13.
- Maree, K. (2019). Planning a research proposal. In K. Maree (ed.) *First steps in research* (3rd ed.). Van Schaik Publishers.
- Mason, J. (1996). *Qualitative researching*. Sage Publications, Inc.
- Maton, K. (2009). Cumulative and segmented learning: Exploring the role of curriculum structures in knowledge-building. *British Journal of Sociology of Education*, 30(1), 43-57.
- Maxwell, J. (2013). *Qualitative research design: An interactive approach* (3rd ed.). Sage Publications, Inc.
- Medhekar, A. & Saha, S. (2021). Strategies for Virtual Online Student Support in the First- Year Economics Unit During the Global COVID-19 Pandemic. In J. Herron & T. Douglas. *Strategies for Student Support During a Global Crisis* (pp.28-47). IGI Global.
- Menon, K. & Motala, S. (2022). Pandemic disruptions to access to higher education in South Africa: A dream deferred? *South African Journal of Higher Education*, 36(4), 47-65.
- Miles, B., Huberman, A., & Saldaña, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd ed.) Sage Publications, Inc.
- Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017-1054.
- Moll, I. (2022). Computers in the classroom: What informs what we teach the teachers? In Makonye, J & Ndlovu, N. *Innovations in online teaching and Learning: Case studies of teacher educators from South Africa during the Covid-19 era*, 191-208. Oasis Publishing.

- Mouton, J. (2022). How to succeed in your master's and doctoral studies: A South African guide and resource book (2nd ed.). Van Schaik Publishers.
- Msimanga, M., Mabalane, V., Ramaila, S. & Ramdhandy, V. (2021). Postgraduate Certificate in Education Student Teachers' Perceptions about Communities of Practice at Schools: Work Integrated Learning Reflections. *International Journal of Higher Education*, 10(5), 155-165.
- Ndebele, C. (2022). Examining the efficacy of professionalising university teaching through formal teaching qualifications at a historically disadvantaged university in South Africa. *The Independent Journal of Teaching and Learning*, 17(1), 23-38.
- Ndlovu, N. & Moll, I. (2016). Teachers, technology, and media types: Teaching with ICTs in South Africa. *African Educational Research Journal*, 4(3), 124-130.
- Ng'ambi, D., Brown, C., Bozalek, V., Gachago, D., & Wood, D. (2016). Technology enhanced teaching and learning in South African higher education – A rearview of a 20-year journey. *British Journal of Educational Technology*, 47(5), 843-858.
- Nieuwenhuis, J. (2019). Introducing Qualitative Research. In J. Maree. *First Steps in Research* (3rd ed). Van Schaik Publishers.
- Nieuwenhuis, J. (2019). Qualitative research designs and data-gathering techniques. In J. Maree. *First Steps in Research* (3rd ed). Van Schaik Publishers.
- Nieuwenhuis, J. (2019). Analysing qualitative data. In J. Maree. *First Steps in Research* (3rd ed). Van Schaik Publishers.
- Nilsen, T., Gustaffson, J. & Blomeke, S. (2016). Conceptual framework and methodology. In T. Nilsen & J. Gustaffson. *Teacher quality, instructional quality, and student outcomes: Relationships across countries, cohorts, and times*, 1-20. Springer Open.
- Ojo, E. (2016). *On teaching economics 1: A qualitative case study of a South African university*. (Doctoral thesis). Retrieved from:
<https://wiredspace.wits.ac.za/server/api/core/bitstreams/653593dd-703b-4c73-a6e1-eff54d8d466a/content>
- Ojo, E. (2023). University Teaching under Pandemic Contexts and Beyond: A Conceptual Framework for Helping Academic Economists in Universities. In R. Pillay, S. Mkwanzani & S. Moonsamy. *Transforming Teaching and Learning Experiences For Helping Professions in Higher Education: Global Perspectives*, 114-129. Brill.

- Paetsch, J., Franz, S. & Wolter, I. (2023). Changes in early career teachers' technology use for teaching: The roles of teacher self-efficacy, ICT literacy, and experience during COVID-19 school closure. *Teaching and Teacher Education*, 135, 1-11.
- Pass, S. (2004). *Parallel paths to constructivism: Jean Piaget and Lev Vygotsky*. Information Age Publishers.
- Piaget, J. (1964). Development and learning. In R. Ripple & V. Rockcastle. (Eds.). *Piaget rediscovered*. Cornell University.
- Piaget, J. & Inhelder, B. (1969). *The Psychology of the Child*. Basic Books Inc. Available at: <https://www.alohabdonline.com/wp-content/uploads/2020/05/The-Psychology-Of-The-Child.pdf>
- Ramsden, P. (1992). *Learning to teach in higher education*. Routledge.
- Picault, J. (2019). The economics instructors' toolbox. *International Review of Economics Education*, 30, 1-13.
- Rapanta, C., Botturi, L., Goodyear, P., Guardia, L. & Koole, M. (2021). Balancing Technology, Pedagogy and the New Normal: Post-pandemic Challenges for Higher Education. *Post Digital Science and Education*, 3, 715-742.
- Francis, Pope (2020). Homily of His Holiness. Vatican Basilica. Available on https://www.vatican.va/content/francesco/en/homilies/2020/documents/papa-francesco_20200531_omelia-pentecoste.html accessed 16th January 2023.
- Sackstein, S., Coleman, E. & Ndobe, T. (2019). Lecturers' Perceptions of Learning Management Systems Within a Previously Disadvantaged University. In P. de Pablos, M. Lytras, X. Zhang & K. Chui, K. *Opening Up Education for Inclusivity Across Digital Economies and Societies*, 1-28. IGI Global.
- Sackstein, S., Matthee, M. & Weilbach, L. (2023). Theories and Models Employed to Understand the Use of Technology in Education: A Hermeneutic Literature Review. *Education Information Technology* (28), 5041-5081.
- Saldaña, J. (2009). *The coding manual for qualitative researchers*. Sage Publications, Inc.
- Schoer, V., Ntuli, M., Rankin, N., Sebastio, C. & Hunt, K. (2010). A blurred signal? The usefulness of National Senior Certificate (NSC) Mathematics marks as predictors of academic performance at university level. *Perspectives in Education*, 28(2), 9-18.

- Sciabarrasi, L. (2023). Addressing new societal expectations for higher education and online learning in the post-Covid-19 era. *International Journal on Innovations in Online Education*, 7(1), 61-67.
- Scott, D. & Morrison, M. (2006). *Key ideas in educational research*. Continuum Publishing Group.
- Seidel, J. (1998). Qualitative data-analysis. *The ethnograph v5 manual*, Appendix E. Available at: <https://eer.engin.umich.edu/wp-content/uploads/sites/443/2019/08/Seidel-Qualitative-Data-Analysis.pdf>
- Selwyn, N. (2014). *Distrusting educational technology: Critical questions for changing times*. Routledge.
- Shava, E. (2020). Reinforcing the role of ICT in enhancing teaching and learning post-Covid in tertiary institutions in South Africa. *Journal of Culture and Values in Education*, 5 (1), 78-91.
- Siegfried, J., Bartlett, R., Hansen, W., Kelley, A., McCloskey, D. & Tietenberg, T. (2001). The status and prospects of the economics major. *The Journal of Economic Education*, 22(3), 197-224.
- Sipe, L. R., & Ghiso, M. P. (2004). Developing conceptual categories in classroom descriptive research: Some problems and possibilities. *Anthropology and Education Quarterly*, 35(4), 472-85.
- Soudien, C., Reddy, V. & Harvey, J. (2022). The impact of Covid-19 on a fragile education system: The case of South Africa. In F. Reimers (Ed.). *Primary and Secondary Education during Covid-19: Disruptions to Educational Opportunity during a Pandemic*, 303-326. Springer.
- Stemler, S. (2001). An overview of content analysis. *Practical assessment, research and evaluation*, 7 (17), 1-6.
- Terre Blanche, M. & Durrheim, K. (2006). Histories of the present: social science research in context. In M. Terre Blanche, K. Durrheim and D. Painter. *Research in Practice: Applied methods for the social sciences* (2nd ed.). University of Cape Town Press.
- Terre Blanche, M., Durrheim, K. & Painter, D. (2006). *Research in Practice: Applied methods for the social sciences* (2nd ed.). University of Cape Town Press.
- Tewari, D. & Ilesanmi, K. (2020). Teaching and learning interaction in South Africa's higher education: Some weak links. *Cogent Social Sciences*, 6(1), 1-16.

- Tondeur, J., van Braak, J., Ermer, P. & Ottenbreit-Leftwich, A. (2016). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. *Education Technology Research and Development*, 65, 555-575. Springer.
- Ugwuanyi, C., Okeke, C. & Alex, J. (2023). Exploring South African university academics' level of preparedness for emergency multimodal remote teaching during the COVID-19 pandemic. *Perspectives in Education*, 41(2), 77-88.
- UNESCO Institute for Statistics. (2022). Available at <https://uis.unesco.org/en/glossary-term/information-and-communication-technologies-ict> accessed 23 December 2022.
- Van der Merwe, A. (2007). Using blended learning to boost motivation and performance in introductory economics modules. *South African Journal of Economics*, 75(1), 125-135.
- Van Wyk, M. (2017). Exploring Student Teachers' Views on ePortfolios as an Empowering Tool to Enhance Self-Directed Learning in an Online Teacher Education Course. *Australian Journal of Teacher Education*, 42(6), 1-22.
- Van Wyk, M. (2018). Economics student teachers' views on the usefulness of a flipped classroom pedagogical approach for an open distance eLearning environment. *The international journal of information and learning technology*. 35(4), 255-265.
- Venkat, H. & Spaull, N. (2015). What do we know about primary teachers' mathematical content knowledge in South Africa? An analysis of SACMEQ 2007. *International Journal of Educational Development*, 41, 121-130.
- Von Glaserfeld, E. (1995). *Radical Constructivism: A way of Knowing and Learning*. Taylor and Francis, Inc.
- Vygotsky, L.S. (1978). *Mind in society: The development of Higher Psychological Processes* Harvard University Press.
- Waghid, F. (2023). Crisis, Changed Leadership, Change Management and Educational Technology. *South African Journal of Higher Education*, 37(4), 1-19.
- Williamson, B. (2020). New pandemic edtech power networks. *Code Acts in Education*. <https://codeactsineducation.wordpress.com/2020/04/01/new-pandemic-edtech-power-networks/>. Accessed 11 Feb 2024.
- Yu, D., Kasongo, A. & Moses, M. (2017). The academic performance of SA economics departments. *South African Journal of Economics*, 85 (1), 138-158.

APPENDIX A: VIGNETTE BASED ON THE RESEARCHER'S INTERPRETATION OF PARTICIPANT A'S EXPERIENCE OF TEACHING WITH ICT

Note: This vignette is based on the semi-structured interview conducted with Participant A and it reflects this researcher's interpretation of Participant A's experience and meaning of ICT integration. It is based on the idea that qualitative researchers adopt "an intersubjective or interactional epistemological stance" (Terre Blanche & Durrheim, 2006, p. 7) to interpret participants' understanding of the social world.

I've been in the economics department since 2011 and in the second semester of 2018. With the covid-19 pandemic this year, things have changed ... it's been a systems shock with several challenges about how to use ICTs to teach.

Before the pandemic, the LMS was used as a place to upload course material for economics 1. We conducted contact lectures and in-person consultations, with assessments in large exam halls to accommodate the 1000 + students registered for the course. The only online component was the tutorials, but a few lecturers did attempt to integrate video clips or questions into their lectures.

Even now, with remote teaching and learning, we use the online functions of the LMS in limited ways. I guess you must think that ironic. But I must explain that it's a matter of principle. It's not about being able to use the online tools and not using them, but that at this institution, we've *chosen* to adopt an asynchronous mode for most course delivery.

Many students are from poor socio-economic backgrounds, and they can't access adequate network services. If they *do* have electricity, loadshedding prevents them from completing assignments on time; their home environment precludes them from watching videos uninterrupted or sitting with a laptop in the small living spaces they occupy. Those challenges are impediments in terms of using ICTs to their full capacity and we've kept it quite simple here in the economics department.

As I said, it's been a challenge and since March 2020, we've had to adapt our teaching practices in several ways. For example, we replaced contact lectures with pre-recorded videos which students downloaded from the LMS. Every lecturer has his or her own presentation style, so the twelve sessions varied quite a bit. Some lecturers were able to develop their own animated graphs with voice-over while others relied on audio explanations and the accompanying static PowerPoint summary slides.

Every week there was a Q & A session on the previous weeks' work which I facilitated.... boy, were those sessions challenging: Firstly, we had issues in Microsoft Teams where the students couldn't see my screen and I couldn't show them my calculations. For me, the worst part was knowing that your students are struggling and not being able to help them sufficiently!

Despite this, the Q & A sessions were the most engaging learning experiences for students. I know this from the feedback in the chats, from how grateful they were for that contact session. I mean, it's difficult to learn

from a textbook and a few downloadable materials. You must participate with others, engage with them and that's why we encouraged students to form WhatsApp groups. So, they could use the forum to collaborate as a group and learn from each other.

We were aware that some students were struggling to complete assessments because of network issues and we negotiated a strategy that would be balanced enough to allow students sufficient time to complete but also prevented cheating and we tried to find something that would work across the faculty. We made sure that components of the course like the video lectures, Q&A sessions and textbook were available for students to download.

However, all assessments were conducted online on the LMS because we had not worked out an alternate way of delivering them. We did think of delivering the tests as take-home assignments, but the format is multiple choice questions, therefore we would never have been able to roll this out because there would've been widespread copying... and we did have an incident of copying.... We would have had to develop unique questions for each of the 1000 students for two tests, nine tutorials and one final exam. That works out to approximately 125 000 individual test items... We just didn't have the capacity!

I've realized that just like the students, lecturers have unique circumstances: some can translate the energy of contact lecturers onto the online space. Many lecturers tried to use the whiteboard function in the LMS or incorporated examples into their notes. But as a group, we're not homogenous since we all have our unique teaching styles, resource challenges and we approach teaching differently. For myself, I tried to translate that energy of face- to-face by asking: *What is it I was going to tell them in class? I'm going to tell them everything on the online notes, so they don't miss anything.* I'd try to deliver that lecture the way they would be in front of me... Try and absorb what are the areas they might not understand. I would include a check for understanding example.

You must understand that economics is highly mathematical and driven by solving equations. It's extremely difficult to build up comprehension from scratch if students aren't in front of you because you can't see their reaction to your words; you can't simplify your explanation based on their response or introduce a different example to explain a principle. If everything is pre-loaded on a slide, all you can do is speak through it, whereas with contact lectures you build up an economic model with them step by step. So, that crucial aspect of demonstrating how to solve a problem has been lost with asynchronous teaching.

But we were fortunate to have two learning consultants who were appointed in January 2020 to serve the learning and teaching needs of the faculty. They encouraged us to use simple tools to develop video lecturers: they advised us to use voice-over PowerPoint, to keep it simple and not to develop data-heavy material. In terms of synchronous delivery, they advised us to keep our videos off and the assumption was that none of us were proficient with online teaching.

If I think about how things have changed since we moved online, I'm proud that we've survived. When the University opted to go to remote learning, the process was rapid. There were no if's and but's, and everyone just got onboard and pulled their weight and did what was required.

But the isolation from each other in the teaching team created difficulties which affected how we worked together. Normally, we'd have weekly meetings to discuss the questions each one had submitted for tutorials and tests. Now, with all of us scattered, all of us fragmented, there's been little time to build that question pool. So, I dipped into previous tests and tweaked questions so they would appear a few times but with different numbers. So, following the law of averages, different students would see different permutations of that similar question. In that way we built up the question bank.

We tried to engage as a group but for the most part, we built up those question pools. There was no time for the back and forth to find out if the quality was acceptable. We used our years of experience and set a variety of questions that evaluated conceptual, terminology, economic models, the relationship between variables and how to use mathematics to solve complex problems. Some of the decisions and ways of working may have been flawed, but we worked with what we had and at least we developed a strategy and a plan for delivering online teaching.

If I had any tips for other lecturers, I would say, plan. If you are going to present online lectures, be very prepared. Keep the videos short so that students can download the files easily. Become proficient with software that allows you to reduce the size of your files. Use simple presentation: a voice over PowerPoint, just to get the message across.

And add that *human element* into your teaching. Try to include several examples and replicate what you would do in contact session. Try to meet the needs of students so that the teaching material provides the support they need, and students don't feel like they could just have read the textbook. Because your teaching should add additional value that students don't find in the textbook. The whole point is that you're still fulfilling the role of facilitator, so you must facilitate learning. You must ask yourself, "*If I present myself to these students in front of the class, what would their issues be, what would they not understand, what do I need to focus on?*"

APPENDIX B: VIGNETTE BASED ON THE RESEARCHER'S INTERPRETATION OF PARTICIPANT B'S EXPERIENCE OF TEACHING WITH ICT

Note: This vignette is based on the semi-structured interview conducted with Participant B and it reflects this researcher's interpretation of Participant B's experience and meaning of ICT integration. It is based on the idea that qualitative researchers adopt "an intersubjective or interactional epistemological stance" (Terre Blanche & Durrheim, 2006, p. 7) to interpret participants' understanding of the social world.

I must be honest, the transition to emergency remote learning and teaching was challenging! We were put on the spot and had to put everything online in a short space of time. Lecturers were tasked with developing video lectures to replace contact lectures, and these had to run in conjunction with the tutorial program.

From a teaching perspective, I have missed not being able to access the doc kam to deliver my lectures. I prefer not to use PowerPoint slides because talking over slides is not the right way to teach. In that case you might as well read the textbook! I believe students need to see how the economic model is built up from scratch and work through it with you, and that's what I miss the most in the doc kam.

I was fortunate to find a new way to deliver my lectures: I used my daughter's whiteboard and connected a webcam so students can see the worked solutions on the whiteboard. I also bought a good microphone so my voice could project, and it seems to be a good solution for the video lectures we developed to replace contact lectures. I feel confident that I can explain things clearly to my students and they can see how the equation develops and the impact on the graph. In addition, I provide explanations by narrating my thinking as I work on the whiteboard.

But everyone has their own preference for teaching strategies and my colleagues have adopted different methods that work for them.

Having technology is great, but one needs to consider students' and lecturers' needs and preferences. Some lecturers only use a pc to deliver lectures; others use the greenboard. Some lecturers don't like to use microphones while students would prefer them to use them to hear clearly. In addition, some technology tools don't provide the functionality that lecturers need to teach their course, so ICT integration is quite a complex thing.

The other factor that impacts use of ICTS is the cost associated with implementation. A few years ago, I employed a maths tutor to develop video solutions for the tutorial questions. This material was uploaded onto the LMS to be used as revision material. Students loved them and at that stage I didn't realise this is the future of learning and teaching! However, it was difficult to secure funding, so we had to stop this initiative because it was too costly.

Similarly, teaching from home is personally costly: I acquired additional equipment to enable the development of video lectures and I had to upgrade my network services to teach online and to be available

to students. Had we, as a teaching team, known before, we could have come up with common solutions to improve teaching from home.

In addition, with this online system, everything works for teaching but not for assessment. It works for smaller classes where students can send answers via email and lecturers can provide feedback. But in our case, with MCQs and large student numbers, it isn't realistic to use take-home examinations.

You ask me what are my views on the value of technology? I think technology benefits affluent students more than those who are disadvantaged. Some students from rural areas have been completely excluded because of network issues. It's so disheartening and unfair to them because they are already on the back foot. I sincerely hope we can open this campus for contact teaching again to give everyone a chance to participate fully in their education!

I hope as a teaching team we can use this experience and develop a solid vision for the future of teaching economics in South Africa. We tend to rely on and mimic Western standards of online teaching and policies. We urgently need to find ways to teach our students so that no-one is left behind.

APPENDIX C: ETHICS CLEARANCE PROTOCOL NUMBER

UNIVERSITY OF THE
WITWATERSRAND
JOHANNESBURG

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Pratt

CLEARANCE CERTIFICATE

PROJECT TITLE

INVESTIGATOR(S)

SCHOOL/DEPARTMENT

DATE CONSIDERED

DECISION OF THE COMMITTEE

EXPIRY DATE

DATE

CHAIRPERSON

PROTOCOL NUMBER: H20/02/36

The relationship between economics lecturers' attitudes to teaching with technology, their pedagogical intentions and teaching practice at an urban South African University

Mrs J Pratt
Education/
14 February 2020
Approved
Risk Level: Minimal

22 March 2023

23 March 2020

pp (Professor J Knight)

cc: Supervisor: Dr I Moll

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

J Pratt
Signature

20, 04, 2020
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX D: INTERVIEW GUIDE FOR SEMI-STRUCTURED INTERVIEWS WITH STUDY PARTICIPANTS

PARTICIPANT A

1. Describe for me your role in the lecturing team in the introductory economics course.
2. How you use technology and if you could look at the lectures and the online component as well. Think about it before the Covid-19 pandemic and the lockdown and what is the case now.
3. How did you manage tutorials before Covid-19 and how are you managing them now?
4. How would you describe your feelings or thoughts about the use of technology for the course.
5. How have you managed with the June exams and how are you going to manage with the December exams. Are you able to share?
6. It sounds like you've done a lot of extra work just to work around the restrictions. How has that affected the lecturing team? Have you managed to pull together or how are people managing?
7. Other than the support from your colleagues and the team, were there any other professional development courses that you've attended over the years to upskill yourself?
8. If you were to compare what your proficiencies in terms of technology were in February and now, how would you say it is, just comparing what you've had to learn over the past 4/5 months?
9. If network issues weren't a challenge, so in other words if everyone had equal access, how would you use technology in the course?
10. How were you conducting your classes with large student numbers before you went online?
11. Have you been able to dabble with whiteboards on the LMS and if so, how are you finding this?
12. How are your students managing?
13. Is there is any value that technology can bring to a subject like introductory economics?
14. Are there any lessons that you've learnt? What would you suggest can be done differently?

PARTICIPANT B

1. How would you describe your role in the course?
2. Is the tutorial program done online once a week?
3. Do the marks for the tutorial count towards students' final mark?
4. What are some of the other challenges you face?
5. How will you manage exams this year?
6. What are your perceptions or impressions of the value of technology?
7. Does the fact that there is no social aspect to learning and teaching with ERT affect students?
8. In an ideal world where everyone has access, how could technology be used

APPENDIX E: EXTRACT FROM TRANSCRIPT OF VIDEO

LECTURE EXPLAINING CONCEPTS IN CHAPTER 9: POSSIBILITIES, PREFERENCES, AND CHOICES

Date of recording: 31 March 2020. Length of video lecture: 8:29. Participant B uses a hand-held microphone to introduce the lesson and explains key ideas of this chapter by drawing on a whiteboard which has a webcam attached to it. The calculations are done on the whiteboard with a whiteboard marker, and graphs are erased whenever a new shift is demonstrated. The original equation is written on the left side of the board as she builds up the model. Format is an MP4 file, and it is uploaded in the Meetings tab on the LMS and could be accessed synchronously and downloaded from the LMS.

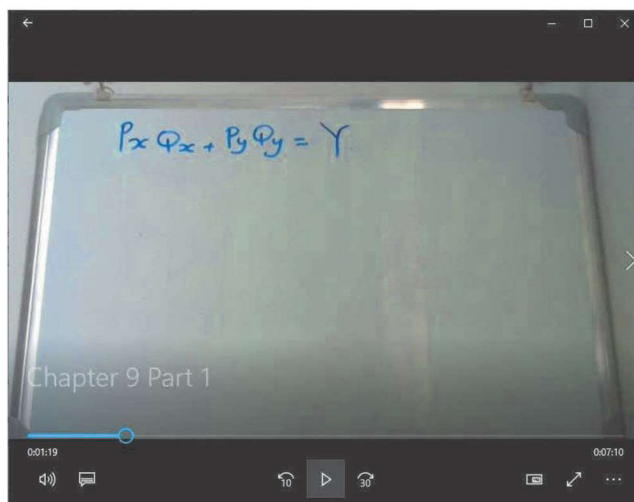
SCRIPT

This video is chapter 9: Possibilities, preferences, and choices. We did discuss some of the concepts you'll hear about in the chapter 8 lecture so some of it might be repetition, in particular the consumption possibilities frontier (CPF) or budget line, so I'm going to again discuss the budget equation, recap some of the main points.

NOTES: *Making connections with previous lectures. Recapping the main points of work done before going onto new content is a strategy to consolidate student learning for long-term learning.*

So, you'll recall we said the CPF, or budget equation looks at an individual's limits or choices to purchase or consume a good taking into account their available income and the price of the good. We said the equation was (assuming good x and good y) (writes on board)

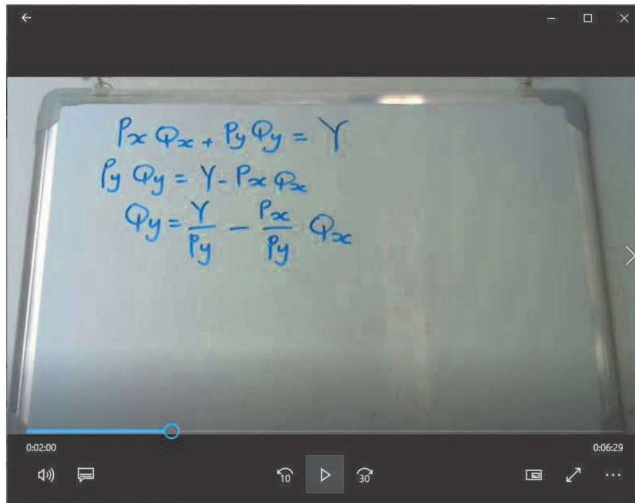
NOTES: *Clarifying a term by including substitute term – e.g., CPF is same as budget equation; limit is same as choices. Showing the equation to clarify the relationship between variables and explaining the terms (e.g., capital Y refers to income)*



We said we represent income by Y (capital Y, that's why there's a small and a capital Y)

NOTES: Making sure students understand the components of the equation – e.g., the fact that there is a capital and small letter Y.

If we are plotting the budget line with Q_y on the y axis, we make Q_y the subject of the formula (writes on board):



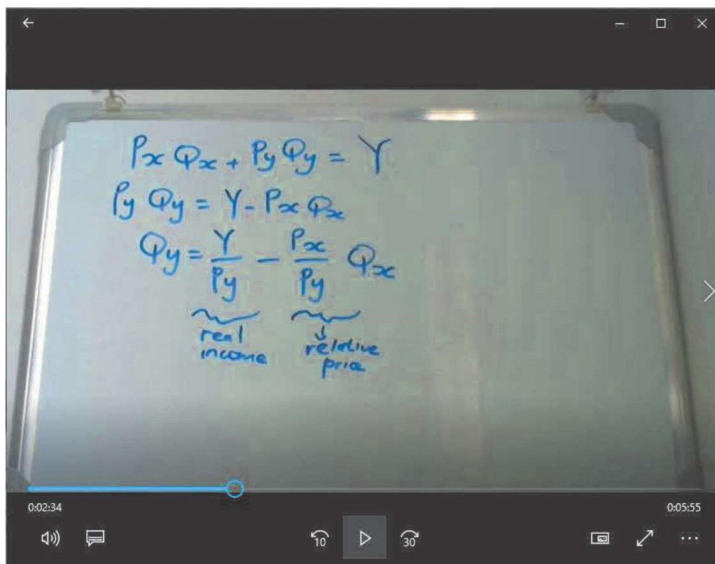
A video frame showing a whiteboard with the following equations written in blue ink:

$$P_x Q_x + P_y Q_y = Y$$
$$P_y Q_y = Y - P_x Q_x$$
$$Q_y = \frac{Y}{P_y} - \frac{P_x}{P_y} Q_x$$

The video player interface at the bottom shows a progress bar at 0:02:00 and a timestamp of 0:06:29.

NOTES: Visual representation of the equation and the workings of the equation and connection to the concept opportunity cost.

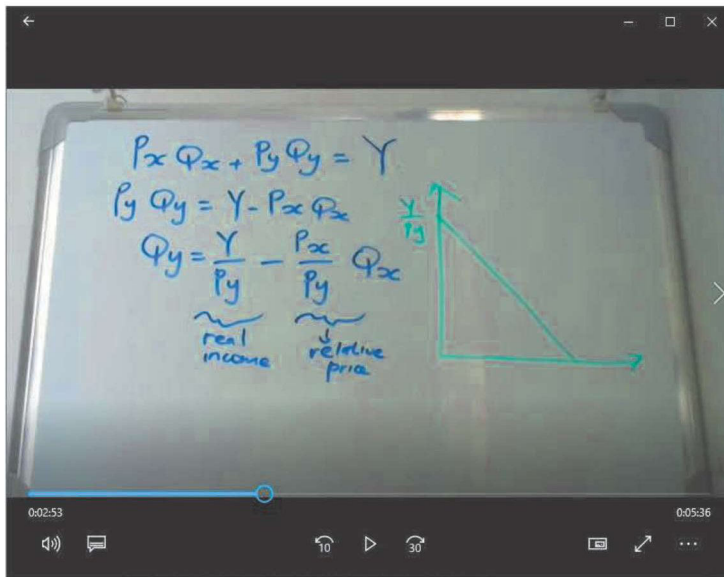
And we said that Y/P_y represents the real income (writes term ‘real income’ under the term in the equation) or the measure of the purchasing power and the relative price is P_x/P_y (writes term ‘relative price’ under the term in the equation). That also represents the opportunity cost.



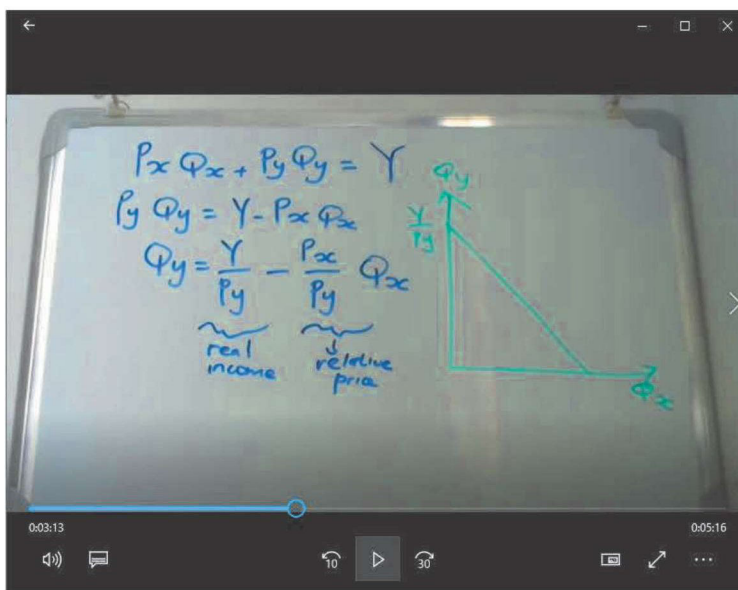
A video frame showing the same whiteboard as the previous one, but with additional annotations. Under the term $\frac{Y}{P_y}$ in the equation $Q_y = \frac{Y}{P_y} - \frac{P_x}{P_y} Q_x$, the words "real income" are written with a wavy line underneath. Similarly, under the term $\frac{P_x}{P_y}$, the words "relative price" are written with a wavy line underneath. The video player interface at the bottom shows a progress bar at 0:02:34 and a timestamp of 0:05:55.

We plotted our budget line with Q_y on the y axis and Q_x on the x axis (draws a graph). That's what our budget line would look like.

NOTES: Graphic representation of the budget line and explaining that the slope is negative.



The slope of this budget line is P_x/P_y . It's a negative sloping curve.



So, we said, what would happen if there were changes in the price of a good. We looked at two types of changes. For example, if the price of good x increases, we will have that the budget line swivels inside.

NOTES: Introducing a change and how the variables would be affected. Starting with increase. Scaffolding.

**APPENDIX F: EXTRACT FROM CONTENT ANALYSIS OF
INTERVIEW WITH PARTICIPANT A TO ANSWER QUESTION:
“WHAT WAS THE NATURE OF LECTURERS’ PEDAGOGY FOR
ICT INTEGRATION IN THE INTRODUCTORY ECONOMICS
COURSE DURING THE COVID-19 PANDEMIC?”**

<i>A. First Cycle Coding</i>		<i>B. Second Cycle Coding</i>		
EXTRACT FROM INTERVIEW	DESCRIPTIVE CODES	PATTERN CODING	BROAD THEMES IDENTIFIED ACROSS DATA	RELEVANCE TO TEACHING QUALITY FRAMEWORK (DARLING-HAMMOND, 2021)
Even now, once we move to Rapid Online Learning, a lot of the issues we had to consider was that not every student has access to the devices, the proper network access or uninterrupted network access. We have a big chunk of our students who have electricity interruptions, so even with remote learning our online teaching was very basic.	STUDENTS HAVE UNEQUAL ACCESS TO RESOURCES AND THIS AFFECTS HOW THE COURSE CAN BE DELIVERED. 1	1. STUDENT'S RESOURCES CONSTRAINED THEIR FULL PARTICIPATION THEREFORE ICT USED IN LIMITED WAYS TO ENABLE PARTICIPATION	1. SUPPORT EQUITY	Knowledge of students' social and emotional needs is evident: different socio-economic backgrounds, therefore varying resources.
The whole point is that you're still fulfilling the role of facilitator, so you have to still be facilitating learning, even in an online setting. You have to ask yourself 'If I present myself to these students in front of the class what would their issues be, what would they not understand in this chapter, what do I need to focus on?'	TEACHING PRINCIPLES APPLY TO BOTH ONLINE AND TRADITIONAL (FACE TO FACE) MODES. 2	2. TEACHING AS A PROCESS OF FACILITATION	2. MAINTAIN STANDARDS	Belief about teaching (TRM) – it is a process of facilitation. Provide students with quality teaching regardless of the setting.

<i>A. First Cycle Coding</i>		<i>B. Second Cycle Coding</i>		
Guidelines (Saldana, 2009):				
1. What are people doing? What are they trying to accomplish?	Balancing student needs while trying to maintain standards. Lecturers transfer fail-proof strategies from traditional teaching to ERT in an attempt to maintain continuity and quality of teaching		2. How exactly do they do this? What strategies do they use?	Accommodating students who could not submit assignments on time; developing video lectures to enable asynchronous learning, supporting students during online tests; emulating traditional strategies.
3. How do participants describe/understand what is going on?	Challenging. Complex because of consideration for student's needs		4. What assumptions do they make?	Need to maintain standards and continuity; support students; develop new skills to teach with ICT
5. What do I see going on here?	Lecturers faced with many challenges and attempting to ensure continuity, support students and grappling with demands of ERT		6. What strikes me?	Commitment to student needs