



# **Technology Use in the English Classroom: High School Teachers' Attitudes and Experiences**

A Dissertation submitted to the School of Education of the  
University of KwaZulu-Natal in fulfilment of the  
requirements for the degree of Master of Education

BY

**NERISHA RAJBALLY**

**213559661**

**Supervisor: Professor Ansurie Pillay**

**June, 2024**

## DECLARATION


I, Nerisha Rajbally, declare that

- (i) The research reported in this dissertation, except where otherwise indicated, is my original work.
- (ii) This dissertation has not been submitted for any degree or examination at any other university.
- (iii) This dissertation does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
- (iv) This dissertation does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:
  - a) their words have been re-written but the general information attributed to them has been referenced;
  - b) where their exact words have been used, their writing has been placed inside quotation marks, and referenced.
- (v) Where I have reproduced a publication of which I am author, co-author or editor, I have indicated in detail which part of the publication was actually written by myself alone and have fully referenced such publications.
- (vi) This dissertation does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the thesis and in the References sections.

Signed:



As the candidate's Supervisor I agree/~~do not agree~~ to the submission of this dissertation.

Signed: 

## **ABSTRACT**

This interpretive qualitative study aimed to understand high school teachers' attitudes and experiences when integrating technology in their English classrooms. Seventeen English teachers from three public high schools participated in the study. Data was generated from the participants using an open-ended questionnaire, individual interviews, and focus-group interviews, and thematic analysis was used to analyse the data. The Technology Acceptance Model (TAM) and Theory of Experience were used for the theoretical framework to understand the reasons for teachers' attitudes and experiences for technology integration. Findings of the study indicate that the participating high school English teachers support the integration of technology in their lessons. However, they face various challenges and barriers with technological integration, and therefore choose to resort to traditional methods of teaching. The attitudes and experiences of teachers were identified by the contributing factors which impacted their integration of technology in their classroom teaching. These factors include the lack/limited access to technology, lack of proper training, overcrowded classrooms, lack of technical support, time constraints, loadshedding, poor internet connection, lack of funds to support the integration of technology, and poor implementation of policies. Lastly, the study found that although teachers were not fully integrating technology into their pedagogies, they demonstrated a positive attitude towards technology by highlighting its benefits for both teachers and learners. Overall, the results indicated that if the barriers that teachers face are addressed and if schools are adequately resourced, then teachers would embrace technology and ensure its successful integration in their classroom pedagogies. It becomes clear that the Department of Basic Education needs to address the implications of investing in infrastructure, resources, and policy implementation in schools to enable the successful integration of technology in schools. Addressing challenges and implementing recommended strategies will maximise the benefits of technology integration and prepare teachers and learners for success in the digital era.

Keywords: Technology; Attitudes; Experiences; High school English teachers

## DEDICATION

*The Almighty Lord Hanuman, in your divine presence, I am profoundly thankful for the guidance, strength and blessings bestowed upon me during the completion of my thesis, as I would not be where I am today without the strength and guidance of God. May his divine presence continue to illuminate my path and inspire me to strive for excellence in all my academic endeavours.*

*To my cherished parents Shanil and Rummie, sisters, Sashnee and Nerenee Rajbally, and beloved husband Raylin Ramsaran,*

*Throughout this challenging journey, your unconditional love, encouragement, and sacrifices have been the cornerstone of my academic journey. You have believed in me when I doubted myself, supported me through every challenge, and celebrated with me in every triumph. This thesis is a reflection of your support and encouragement which have been the driving force behind my accomplishment. Words cannot express the depth of my gratitude for everything you all have done for me throughout the years of my academic journey. Thank you Dad and Mum for your sacrifices and prayers. Sashnee, thank you for always believing in me and encouraging me whenever I felt overwhelmed. You have always supported my dreams. My dear husband, Raylin, thank you for your unconditional support and reassurance, whether it was through providing words of encouragement or by simply making a cup of tea during those late nights, your belief in me has given me the strength to persevere through the most challenging moments.*

*To my beloved sister Nerenee, I dedicate this thesis to you,*

*In the pages of this thesis, I find reflections of our shared journey during my academic pursuit. In every step of this arduous academic pursuit, you have been my companion, offering me encouragement, understanding and steadfast belief in my abilities when at times, I felt demotivated. Your support has been my anchor in times of doubt and my source of joy in moments of triumph. This thesis stands as a small token of my immense gratitude for your endless reassurance and understanding during my highs and lows. Thank you for always cheering me on, celebrating me and being my pillar of strength in every journey of mine. Thank you for being my ultimate source of inspiration and support.*

## **ACKNOWLEDGMENT**

I would like to express my sincere gratitude to my supervisor, Professor Ansurie Pillay, who I am deeply indebted to. Thank you for your unwavering support, expert guidance and invaluable mentorship throughout the entire journey of this thesis. Your profound knowledge, constructive feedback and relentless encouragement through our Zoom meetings have been valuable in shaping my research and ultimately the completion of my thesis. I am incredibly grateful for the countless hours that you have dedicated to reviewing my work that has significantly enhanced the quality of my thesis. Professor Ansurie Pillay, you have not only provided academic direction, but also inspired me to strive for excellence, pushing me beyond my limits to achieve the best possible outcomes. Your dedication, patience and belief in my abilities have truly been the driving force behind my thesis's success. I am profoundly thankful for the opportunity to work under your supervision.

A special thank you to my colleagues and participants in the Language Department at the schools used for research. I am grateful for the stimulating discussions, collaborative efforts and for kindly agreeing to participate in this study.

Thank you all for being an integral part of this journey. This thesis would have not been possible without the collective and support from all who was a part of this journey.

## KEY TERMS

**Accessibility:** refers to designing and developing digital products that can be accessed and used by people (Botelho, 2021).

**Attitudes:** reflect an individual's evaluations, feelings and behavioural tendencies toward objects, peoples or situations which can be either positive or negative and can influence thoughts, emotions and actions (Eagly & Chaiken, 1993).

**Digital Technology:** refers to electronic tools, systems and devices that use digital signals to generate, store, process and exchange data which encompasses hardware like computers, smartphones as well as software applications and internet-based platforms (Brynjolfsson & McAfee, 2014).

**Experiences:** include the knowledge or skills gained through being involved in or exposed to something over a period of time. It also refers to personal perceptions that arise from a complex interplay among physiological, cognitive, and situational variables that bring about a diverse expression of human behaviour (Eagly & Chaiken, 1993).

**Fourth Industrial Revolution (4IR):** refers to the ongoing transformation of traditional industries through the integration of digital technologies, such as artificial intelligence, robotics and the internet, amongst many other technologies (Miller, 2015).

**ICT Education:** refers to the integration of Information and Communication Technology (ICT) tools and resources into the teaching and learning processes such as computers, digital media, internet resources and educational software to enhance and facilitate educational practices (Hennessy & Murphy, 2020).

**ICT room:** is the abbreviation for Information and Communication Technology room, which is a designated space in a school equipped with computers, networking infrastructure, and other technological resources.

**Loadshedding:** involves the deliberate shutdown of electric power in a part or parts of a power-distribution system, usually to prevent the failure of the entire system when the demand strains the capacity of the system (Conrad et al., 2020).

**OHP:** is the abbreviation for overhead projector which is a device that projects images onto a screen or wall for presentation purposes.

**Pedagogy:** refers to methods of instruction and/or techniques of teaching such as instructing and educating to communicate knowledge or skills (Loughran, 2006).

**SSS Programme:** a comprehensive framework within the South African education system that provides various forms of support to schools, learners and educators. The purpose is to address any form of educational and developmental barriers by offering support and ensuring equitable access to quality education (Department of Basic Education, 2016).

**Teaching:** refers to the actions of a real live instructor designed to share knowledge to learners (Du Plessis et al., 2007).

**Technology:** for the purposes of this study, the term ‘technology’ is used synonymously with computer equipment, software, and other electronic devices (Woolie, 2010). This concept is considered in the literature review.

**Technology integration:** necessitates the effective implementation of educational technologies to accomplish the intended learning outcomes, which means using equipment in the classroom (Warschauer & Ames, 2010).

## TABLE OF CONTENTS

	<b>PAGE</b>
<i>DECLARATION</i>	<b>ii</b>
<i>ABSTRACT</i>	<b>iii</b>
<i>DEDICATION</i>	<b>iv</b>
<i>ACKNOWLEDGMENTS</i>	<b>v</b>
<i>KEY TERMS</i>	<b>vi-vii</b>
<i>TABLE OF CONTENTS</i>	<b>viii-xii</b>
<b>CHAPTER ONE : INTRODUCTION</b>	<b>1-14</b>
1.1. Introduction	1-2
1.2. Rationale/Motivation	2
1.3. Purpose of the study	3
1.4. Background and Context	<b>3-7</b>
1.4.1. Background	3-6
1.4.2. Context	6-7
1.5. Overview of key studies dealing with the topic	7-8
1.6. Research objectives and questions	8
1.7. Overview of the research process	8-9
1.8. Researchers stance	9-12
1.9. De-limitations	12-13
1.10. Organisation of the dissertation	13-14
<b>CHAPTER TWO: LITERATURE REVIEW</b>	<b>15-43</b>
2.1. Introduction	15
2.2. Conceptualising Technology	15-19
2.3. Technology Integration in Education	<b>19-25</b>
2.3.1. <i>Benefits of Technology Integration in Education</i>	22-23
2.3.2. <i>Barriers to Technology Integration in Education</i>	23-25
2.4. Teachers' Understandings and Experiences of Technology Use	25-28
2.5. Teachers' Attitudes Towards Technology	29-33
2.6. How teachers' and experiences shape their pedagogical decisions	33

2.6.1. Understanding Pedagogy	33-34
2.6.2. Teachers' pedagogical beliefs and attitudes when using technology in the classroom	34-35
2.6.3. The impact of technology on teachers' pedagogical decisions	35-37
2.7. Technology Use in the English Classroom	<b>37-40</b>
2.7.1. Effective Use of Technology in the English Classroom	37-40
2.8. The DBE Action Plan to 2014: Towards the Realization of Schooling 2025	40-41
2.9. Potential Impact of DBE on Teacher Training and Professional Development on Technology Integration in English Classrooms	42-43
2.10. Chapter Conclusion	43
<b>CHAPTER THREE: THEORETICAL FRAMEWORK</b>	<b>44-66</b>
3.1. Introduction	44-45
3.2. TECHNOLOGY ACCEPTANCE MODEL	<b>45-47</b>
3.2.1. Explaining the Three Constructs	47-52
3.2.1.1. Perceived Usefulness (PU)	47-49
3.2.1.2. Perceived Ease of Use (PEoU)	49-51
3.2.1.3. Attitudes Towards Use (ATU)	51-52
3.2.2. The Broader Use of Tam	52-53
3.2.3. Types of technologies teachers are using in relation to PU, PEoU & ATU	53-55
3.2.4. Implication of the Technology Acceptance Model (TAM)	55-56
3.2.5. Limitations Of the Technology Acceptance Model (TAM)	56
3.2.6. Shortfall of TAM	57-58
3.3. THEORY OF EXPERIENCE	<b>58-63</b>
3.3.1. Theorising Experience	58
3.3.2. Dewey's Pragmatic Theory of Experience	58-60
3.3.2.1. Interaction and Continuity	60-
3.3.2.1.1. Criteria of Continuity	61
3.3.2.1.2. Criteria of Interaction	61-62
3.3.3. Studies Using the Theory of Experience	62
3.4. Implications/Limitations of the Theory of Experience	63
3.5. Relationship Between the Technology Acceptance Model and The Theory Of Experience	<b>63-66</b>
3.5.1. The Technology Acceptance Model (TAM)	63-64

3.5.2. Theory of Experience	64
3.5.3. Relationship between the Technology Acceptance Model and the Theory of Experience	64-66
3.6. Chapter Conclusion	66
<b>CHAPTER FOUR: RESEARCH METHODOLOGY</b>	<b>67-96</b>
4.1. Introduction	67
4.2. Research Paradigm	67-68
4.3. Research Approach	68-69
4.4. Research Design	<b>69-70</b>
4.4.1. Outline of the Research Process	70-71
4.5. Recruitment and Sampling	<b>71-78</b>
4.5.1. Recruitment of Participants	71-73
4.5.2. Sampling	74-75
4.5.2.1. Description of the Sample	75-78
4.6. Ethics, Gatekeeper Approval, Informed Consent	79
4.7. Data Generation Strategies	<b>79-84</b>
4.7.1. Open-ended questionnaire	80-81
4.7.2. <i>Interviews</i>	<b>81-84</b>
4.7.2.1. <i>Individual Interviews</i>	81-82
4.7.2.2. <i>Focus Group Interviews</i>	82-84
4.8. Data Analysis	<b>84-90</b>
Phase 1: Familiarising yourself with the data	85
Phase 2: Generating initial codes	85-87
Phase 3: Searching for themes	87-88
Phase 4: Reviewing potential themes	88
Phase 5: Defining and naming themes	89
Phase 6: Producing the Report	89-90
4.9. Storage of Data	90-91
4.10. Trustworthiness	<b>91-94</b>
4.10.1. <i>Credibility</i>	91-92
4.10.2. <i>Transferability</i>	92-93
4.10.3. <i>Dependability</i>	93
4.10.4. <i>Confirmability</i>	93-94

4.11. <i>Limitations</i>	94-96
4.12. Chapter Conclusion	96
<b>CHAPTER FIVE: DATA PRESENTATION AND DISCUSSION OF FINDINGS</b>	<b>97-132</b>
5.1. Introduction	97
5.2. Data Analysis: Themes	97
5.3. Presentation of Data	<b>98-131</b>
5.3.1. Theme One: High School English Teachers' Attitudes, with Reasons to Technology Use in the English Classroom	98-103
<i>5.3.1.1. High School English Teachers' Positive and Negative Attitudes to Technology Use in the English Classroom</i>	98-103
5.3.2. Theme Two: High School English Teachers' Experiences, with Reasons of Technology Use in the English Classroom	98-103
5.3.3. Theme Three: How High School English Teachers' Attitudes and Experiences of Technology Shape their Pedagogical Decisions	117-131
5.4. Chapter Conclusion	131-132
<b>CHAPTER SIX: SUMMARY, IMPLICATIONS AND CONCLUSION</b>	<b>132-140</b>
6.1. Introduction	132
6.2. Main Findings	<b>133-135</b>
6.2.1. High School English Teachers' Attitudes, with Reasons to Technology Use in the English Classroom	133-134
6.2.2. High School English Teachers' Experiences, with Reasons of Technology Use in the English Classroom	134
6.2.3. How High School English Teachers' Attitudes and Experiences of Technology Shape their Pedagogical Decisions	134-135
6.3. Theoretical Implications	135-136
6.4. Implications for Policy	136-137
6.5. Methodological Implications	137
6.6. Professional Practice Implications	138
6.7. Areas for Future Research	139-140
6.8. Chapter Conclusion	140-170

<b>REFERENCES</b>	<b>141-170</b>
<b>APPENDICES</b>	<b>171-183</b>
<b>APPENDIX A-</b> Open ended questionnaire	171-173
<b>APPENDIX B-</b> Individual Interview	174
<b>APPENDIX C-</b> Focus Group Interview	175
<b>APPENDIX D-</b> Ethical Clearance Letter from UKZN	176
<b>APPENDIX E-</b> Gatekeeper Letter	177
<b>APPENDIX F-</b> Information Sheet and Consent Form	178-181
<b>APPENDIX G-</b> Turnitin Originality Report	182
<b>APPENDIX H-</b> Letter from the Editor	183

# CHAPTER 1

## INTRODUCTION

### 1.1. Introduction

In a rapidly changing digital world, technology has ingrained itself into everyday life and has a significant impact on many facets of society, including education, where technology is becoming increasingly difficult to ignore in schools. Technology integration appears to be a promising way to transform the teaching and learning process as classrooms move away from static spaces to dynamic learning environments. The use of technology in the classroom has become increasingly prevalent, and is completely changing the way in which teachers teach and learners learn (Mamba & Isabirye, 2015), where, with the use of technology, teachers may improve learner engagement, encourage creativity, and tailor learning experiences for all learners of all ages. In this regard, the English classroom is a dynamic setting, where incorporating technology has the potential to greatly enhance teaching strategies, engage learners, and promote digital literacy. However, the integration of technology is also met with challenges such as ensuring every school has access to devices, addressing the digital literacy gaps, and managing time efficiently and effectively when introducing devices to classrooms.

Overall, the use of technology in the classroom is changing education, and presenting both opportunities and difficulties to classroom teachers. According to Van Niekerk and Blignaut (2014), in order to meet the demands of modern educational methods, teachers must integrate a variety of technological devices into their teaching and learning environments. Because these digital information sources have such a strong influence on learning, learning itself has gained new meaning. However, according to Ramorola (2013), poor preparation and a lack of resources may prevent technology-based tools from being successfully incorporated into teaching. In order to encourage teachers to use technological devices in such a way as to benefit learners, the education system also needs to make provision for these devices at schools. Utilising technology in the classroom has influenced a radical change in the teaching and learning environment, in the sense that it moves away from a teacher-centred approach, to a more learner-centred approach, resulting in learners becoming active participants of their learning, as well as innovative thinkers (Soobik, 2014).

This dissertation will seek to understand the attitudes and experiences of high school teachers when using technology in their English classrooms. The dissertation argues that with the

positive results that come with technology integration, teachers also face challenges and barriers when trying to integrate technology into their classrooms.

In this chapter, attention is drawn to the rationale and motivation for embarking on the topic, the purpose of the study, as well as the background and context of the study, and it provides an overview of the key studies and terminology used in the study. Thereafter, the research objectives and research questions are presented, the de-limitations are outlined, and the organisation of the dissertation is explained.

## **1.2. Rationale and Motivation**

Learners today live in a technologically advanced world, and are exposed to various forms of technology, such as web surfing, educational videos/presentations. and computers, which may be viewed as useful and enjoyable technological tools. If a learning environment uses such tools, it builds on what learners already enjoy, and actively allows for critical thinking and problem solving skills in the classroom as technology may be used to deepen learners' engagement in a meaningful and intellectually authentic curriculum (Taiwo, 2009).

My initial curiosity regarding teachers' attitudes to and experiences of technology was sparked when I was employed at a school in which many teachers, while being enthusiastic about using technology in their classes, did not fully integrate it into their English lessons. Instead, they pointed out the obstacles that prevented them from using technology in their English classrooms. There was therefore a gap between enthusiasm for technology and actual integration of technology in their English classrooms.

This research builds on my initial curiosity and helps to understand the attitudes and experiences of a group of high school English teachers from three schools regarding their technology integration in their English lessons. This personal interest was helpful in driving my desire to research technology integration in the English classroom and to understand the reasons behind teachers' attitudes and experiences which shaped whether they used technology in their classrooms.

### **1.3. Purpose of the study**

This study gathers insight into the attitudes and experiences of high school English teachers when integrating technology in their classrooms. By understanding teachers' experiences and attitudes, the research study aims to identify the opportunities, areas for improvement and the potential barriers to the implementation of technology. Ultimately, once the study is completed, I hope to be able to identify the measures that are taken and should be taken by schools' management teams, teachers, and the Department of Basic Education to ensure that technology is accessible and distributed to schools for innovative teaching and learning to take place.

I therefore aim to understand, from teacher's perspectives, why some teachers, in the schools being studied, are in favour of technology integration, and why it is beneficial, whereas some believe it is challenging, and creates a barrier to teaching in an English classroom.

### **1.4. Background and Context**

#### **1.4.1. Background**

It is evident that South Africa has faced many changes in the education system since the integration of technology in classrooms and schools (Juma et al., 2017), and in order to understand the significance of technology in education, it is important that policies are put into place, and adhered to.

Technology integration can improve instruction in the classroom, which may lead to an enhancement in learners' academic abilities and skills (Livingstone, 2012), and has spread worldwide, and many policies have been developed both nationally and internationally to promote technology integration in schools (Livingstone, 2012). Such policies suggest that technology offers new ways to attain improved quality, effectiveness and efficiency of teaching and learning, and thus the integration of technological devices in schools, for use by teachers and learners, has become a priority in the education system (Livingstone, 2012). In a research study by Bingimlas (2009), it was noted that technology integration has become a pivotal role in bringing about new ways of teaching and prepares learners for a technologically advanced future.

The Curriculum and Assessment Policy (CAPS) (DBE, 2011) envisions that every learner who passes through the South African education system should have competencies in technology

usage through its use in schools across the various subjects and grades. The CAPS document (DBE, 2011) also emphasises the importance of technology integration amongst both teachers and learners, which helps them to gain the necessary skills necessary for a digital age. The CAPS document (DBE, 2011) also emphasises the importance of technology integration into the curriculum by explaining how technology ought to be incorporated in the outcomes of the lesson, content of the curriculum, and teaching strategies in order to support effective teaching and learning. It is therefore evident from the curriculum documents that the DBE is interested in closing the digital gap by using technology in ways that could empower and transform South Africa's people.

Such sentiments and requirements emanate from a project described in the White Paper on e-Education (Education White Paper 7, section 2.23, Department of Basic Education, 2004) that set a deadline of 2013 for all teachers and learners to be skilled in the integration of technology in classrooms for better teaching and learning. Three stages were suggested for the implementation of the government's policy in order to attain the objectives outlined in the White Paper on e-Education:

Stage 1: From 2004-2007: Improve instructional preparedness and system-wide readiness to use technological devices for teaching, learning and administration.

Stage 2: From 2007-2010: Integrate technological devices into teaching and learning across the school system.

Stage 3: From 2010-2013: Integrate technology at all levels, which include management, teaching and learning, and administration.

While these objectives were partially achieved in provinces like Gauteng and the Western Cape, there are still many provinces that have not achieved these goals because of the distribution of resources. As noted by Juma et al. (2017), South African schools still face significant challenges in education but especially with the implementation of technology in public schools. Juma et al. (2017) further explain that that South African class sizes are large and resourcing each classroom and public school in the provinces continues to remain a challenge. Likewise, the DoE has noted that many teachers in South Africa teach in dilapidated

schools in South Africa which are struggle with poor and unreliable internet connections, and with challenges such as the affordability and maintenance of computers and other technologies (DoE, 2007).

Vandeyar (2015) has noted that the policies set out by the government have not been communicated efficiently with all schools and some provinces enjoy the distribution of resources, while others do not. Such unequal distribution of resources impacts teaching and learning. Vandeyar (2015) further noted that teachers do not implement technology largely because the policies do not give explicit guidance on pedagogical integration of technology and technological devices. In addition, teachers do not have the facilities to integrate technology into their lessons and classrooms due to poor infrastructure and thus, ignore tend to technology integration.

In 2005, the DoE developed the National Education Infrastructure Management System (NEIMS) to quantify the physical infrastructure for education in all schools in South Africa. The 2007 NEIMS Report showed that nationally, 56% of the 1972 schools had more than 10% of their learners without desks, and 58% of schools had more than 10% of their learners without chairs. The NEIMS Report indicated that nearly 30% of schools in some areas of the country still have no source of electricity in or near the schools, and land-line connections are only present in 24% of schools (DoE, 2007).

In 2013, the South African government invested in technology-based tools for teaching and learning, such as upgrading school infrastructure and equipment to help technology integration (Ramorola, 2013). Despite these initiatives, it might not have been enough as many schools in South Africa were not integrating technology into their lessons (Ramorola, 2013). In a 2014 study, Makgato (2014) found that the barriers identified by the DoE in 2007 still existed and schools were still not adequately resourced and operated with poor infrastructure, which impacted teachers' integration of technology in their classrooms. Other factors noted in Makgato's (2014) study included the lack of competence of teachers due to a lack of training, lack of technical support, and time constraints experienced by teachers when setting up technology use. Rural areas, especially, face a lack of resources and infrastructure, preventing many schools from benefiting from technological integration (Makgato, 2014). This situation is the reality in South Africa and is a major constraint that limits effective technological integration.

However, in April 2019, a mandate was signed by the President of South Africa to ensure the integration of the Fourth Industrial Revolution (4IR) into the education system in the form of robotics and coding. The Department of Basic Education (DBE) supported this idea, initially presented in 2016, as they recognised that robotics would be used increasingly in the future. Thus, in the schooling system, it was imperative that learners were able to garner the necessary skills, abilities and knowledge (Fataar, 2020). Nomalungelo (2018, p.2) notes that the DoE's goal was to "prepare learners to function in the 4<sup>th</sup> Industrial Revolution and prepare them for a technologically advanced world." Such sentiments indicate the need for schools to embrace the evolving technologies and to prepare for these changing environments.

While the government endeavours to foster a technologically advanced education system, it is important to understand how teachers respond to such innovations based on their attitudes towards, and experiences of the integration of technology in classrooms. Such understandings are essential for shaping curriculum design and guiding policy decisions aimed at promoting effective technology use in the classroom. Therefore, this study aims to contribute to the broader literature by exploring and understanding the attitudes and experiences of high school English teachers towards the integration of technology in the classroom.

#### **1.4.2. Context**

The study worked with level one teachers, level two Departmental Heads of Languages, and level three Deputy Principals in three urban public secondary schools in KwaZulu-Natal, Durban. All schools comprised multiracial learner and teacher populations. Pseudonyms were used for the three schools, namely Maplewood Secondary, Riverdale Secondary and Sunset Valley Secondary. These three neighbouring schools are situated in a historically Indian urban area. Sunset Valley was the first school to be established in this area in 1951, followed by Maplewood Secondary in 1976, and Riverdale Secondary in 1982. The schools opened in response to the need for further secondary schools in Verulam.

Learners attending these schools come from different socio-economic backgrounds and geographical locations. Many learners come from within the Verulam area, as well as the neighbouring townships. While many learners live in poor socio-economic home environments (with issues of separation, child-headed households and abandonment), others live in average to above average socio-economic households. The number of learners at these schools range

from between 1100-1250 learners and a staff component that ranges from 40-46 permanently employed teachers. These schools are headed by principals, departmental heads, and two deputy principals. Each school works with classes from Grade 8 to Grade 12. At each school, there are six units (classes) per grade and classes comprise approximately 40-45 learners.

These schools have been classified as Quintile 4 which means that the schools are fee-paying schools, which are generally located in relatively affluent communities, and school fees are received from parents together with minimal state funding (Motala & Sayed, 2009). The quintile system has been designed to address the issues of equity and quality (DoE, 2006) in the education system, as stipulated in the 2000 National Norms and Standards for school funding (DoE, 2006). A comprehensive and varied curriculum is offered at each of the schools and caters for learners with different abilities and skills. Each of these three schools offers a range of extra-curricular activities which has led to learners achieving provincial and national accolades. These schools aim to keep abreast with the 21<sup>st</sup> century teaching methods and advancements with the hope of receiving resources through sponsorships for this implementation. I chose to undertake this research at secondary schools, because firstly I teach at Maplewood Secondary School, and secondly, the two other schools, Riverdale Secondary and Sunset Valley Secondary are neighbouring schools, and were therefore conveniently located nearby with ease of access.

### **1.5. Overview of key studies dealing with the topic**

This study builds on various research studies. However, the following studies have been identified as key studies that shaped this study. Broekhuizen (2016) and Mustafina (2016) provided valuable and relevant information in answering the first research question (indicated below). These researchers focused on the attitudes that school teachers have towards technology use in the English classroom. These studies provided information on teachers' positive and negative attitudes to technology use and helped to understand how attitudes shape technology use.

Studies by researchers Voogt (2012), Orega and Fuentes (2015), Vasile (2016) and Siefert et al. (2019) were significant in providing useful and important information in answering my research question based on teachers' experiences of technology use. These studies supported this research study as many teachers in the cited studies faced both positive experiences, as well as challenges in their classrooms when they integrated technology into their lessons.

Studies by researchers Prestridge (2014), Tondeur et al. (2017) and McCulloch (2018) were also important in providing important and related information in answering the research question based on how teachers' attitudes and experiences of technology use decided their pedagogical decisions. These studies, from varying contexts, provided insights into the research questions under study. These studies, as well as others, will be fully explored in my Literature Review chapter.

### **1.6. Research objectives and questions:**

The objectives of this study are to, firstly, explore high school teachers' attitudes and experiences of technology use in their English classrooms; secondly, the study seeks to understand why high school teachers perceive and experience technology use in the way they do; thirdly, the study aims to explore how high school English teachers' attitudes and experiences of technology use in the classroom shapes their pedagogical decisions.

This dissertation seeks to address the following questions:

1. What are high school English teachers' attitudes and experiences of technology use in the English classroom?
2. Why do high school English teachers perceive and experience technology use in the way they do?
3. How do high school English teachers' attitudes and experiences of technology use shape their pedagogical decisions?

### **1.7. Overview of the research process**

The study follows an interpretive paradigm, which allows for an understanding of participants' attitudes and experiences. A qualitative approach was used for the study to gain rich, in-depth data to explore and understand the attitudes to and experiences of the teachers in the study when using technology in their English classrooms. The research design is a case study, which provided an opportunity to generate different kinds of data. The three methods of data generation that were used in this study were an open-ended questionnaire, individual interviews, and focus-group interviews.

The type of sampling selected for this study was purposive sampling which involved “selecting units (e.g., individuals, groups of individuals, institutions) based on specific purposes associated with answering a research study’s questions” (Teddlie & Yu, 2007, p. 77). Purposive sampling served to highlight features of the participating group that are of interest, and a group that will allow for the answering of the research questions in the study. Moreover, it involves identifying and selecting individuals or groups of individuals that are particularly knowledgeable about or experienced with the phenomenon of interest. Seventeen high school English teachers were purposively sampled as participants. Prior to commencing the study, gatekeeper permission and ethical clearance were successfully obtained. Thereafter, participants were recruited, and informed consent was sought from each of them. These aspects will be discussed in greater detail in the methodology chapter.

### **1.8. Researcher stance**

As a teacher, I have always been passionate about education and technology. Reflecting on my own experiences and observations as a teacher and researcher, I noticed that teachers were enthusiastic about technology, considering it to be a method of teaching with many benefits. However, many teachers did not use it. The school management also showed great enthusiasm for technology, indicating the need to keep up with the Fourth Industrial Revolution (4IR), and gained sponsorships for certain devices, but these were very rarely utilised.

As an English teacher, I have always believed that innovative teaching methods may be fostered creatively in the classroom, and with the new generation of learners who are very tech-savvy, newer methods of teaching should be practiced in the classroom, which will move away from the traditional methods to modern methods of teaching and learning. I have, to some degree, undergone training in using technology. In my first year of University, I took the module Computer Literacy, which allowed me to understand the various ways in which to use a computer, including how to create presentations and how to utilise the device in a classroom. There was also a first-year module called Teaching Practice, which helped unpack digital literacy and the best practices for technology integration. This module demonstrated how to use certain devices, such as connecting a laptop to a projector or using an OHP in the classroom, which emphasised teachers moving away from the traditional methods and moving towards innovative ways of teaching to create engaging teaching and learning experiences. In addition to this formal training at university level, I sought out opportunities for self-directed learning

and professional growth by exploring online tutorials and educational blogs showing how certain devices and software may be used in the classroom and this helped me, as a new educator, to stay current with the emerging trends and innovative practices of educational technology.

The reason why I use technology is mainly to enhance learner learning and engagement. It also makes my preparation for lessons much easier when creating PowerPoints, short video clips, and visuals. This helps me to create a dynamic and interactive learning experience, which caters for the diverse range of learning styles I have amongst my learners. Technology in my English classroom has also enabled learners to collaborate with their peers, to share ideas, and to engage in meaningful discussions both inside and outside of the classroom. By using technology, learners are better prepared for a digital world by becoming aware of how devices work, and may use them in their own lives.

I generally integrate technology in my lessons based on the learning objectives and instructional needs and use an OHP or projector for PowerPoint presentations. I use technology to complement a lesson, rather than take over the entire lesson. For example, if I am teaching poetry, I will use it to depict a context related to the poem, to ensure better understanding to help learners make notes, summaries, and analyses of the poem. Another example would be using a visual representation in the form of video clips to teach literature. These video clips are used to show important scenes related to novels, dramas, and plays. Learners are able to put a picture to the text, and when it comes to classwork or answering questions in a test or project, learners are able to provide detailed answers and motivations because of what they have seen. While the visual representation / movie of the novel, drama or play is shown to learners, they still have to read the novel, drama or play, as referring to acts and scenes or chapters is important for independent thinking and learning, as well as when being assessed. When learning language structures, grammar, pronunciation and vocabulary, I try to teach them in an enjoyable way, using YouTube videos, in order to show concepts and rules of language and grammar to learners. When making visual representations of advertisements, comic strips or cartoons, or language aspects such as sentence construction, active and passive voice, articles, amongst the many, I use short video clips.

At times, I use the school's E-Learning Centre, where I am able to use an OHP, smart board and a screen in order to connect devices to my laptop or, in my classroom, I use my own laptop

and borrow speakers from a colleague. Because there are large classes in my school, the sound from a laptop is not always clear, so I connect two speakers to my laptop. In my classroom, I do not have access to any school-owned technological devices. However, one of my personal primary devices that I use in my classroom is my laptop. I am continually adapting and updating my skills in order to effectively integrate new technologies into my teaching and learning.

Technology has brought about exciting opportunities and unique challenges to the classroom. The opportunities that technology integration has provided is the ability to create a more interactive and engaging learning experience for learners. With the resources available to the school, I am able to integrate these devices into my lessons to meet diverse needs and learning abilities. Technology has opened up many avenues to distribute a variety of resources to learners, which has helped create meaningful learning. Not only am I relying on the textbooks in the classroom but videos, audios, presentations as well as documents with additional information are provided. These methods have helped to transcend the boundaries that exist in a traditional classroom, which has in turn helped to prepare learners for a digital world as well as educate them on how to use these devices. I am also able to use WhatsApp to communicate with learners after school hours, by providing feedback and support to learners, which has benefitted the English classes I teach. However, there are some learners who come from poor areas, and do not have the access to digital devices at home, and reliable internet connectivity outside of the school. This does impact learners not receiving resources at the same time. Thus, copies of information have to be made available and distributed to learners as well.

While technology provides many opportunities, there are also challenges associated with technology integration. As indicated, devices and equipment are not available in classrooms. If technology, other than a laptop, is needed, teachers need to move to the designated E-Learning Centre, where it takes time to set up and get the devices running. This room needs to be booked in advance, and often many teachers want the room at the same time. I started to over-rely on the use of technology in my lessons, which also impacted on the learning experiences at times. It started to detract from the lesson being meaningful, because the technology started to become the focus, rather than the content of the lessons. Recognising such, I was obliged to adapt my technology use.

As a teacher entering the teaching field, I am extremely comfortable using technology in my classroom. Over the past seven years of my teaching, I have tried to embrace technological devices in my classroom in order to help enhance my teaching practice, as well as promote

more collaborative learning amongst learners. I am confident using my laptop, the OHP, smartboard as well as projector screens. Creating PowerPoint presentations in my lessons has made preparation much easier, such that when I am delivering a lesson, I feel confident using it. Technology also works well for me for lesson preparation, as I use it to prepare and save my work instead of carrying multiple heavy work and textbooks around. If I experience technical difficulties, I have learners who are knowledgeable about these devices to assist for the continuation of the lesson. Technology is appreciated in the classroom, where learners enjoy their technology-enhanced lessons over traditional ones, and are always willing to assist with minor setbacks. Instead of relying on the traditional methods, using something that was different from the usual ways of teaching also enhanced learner engagement and made learning much more collaborative and meaningful.

I am an English teacher engaged with research, and am a teacher at Maplewood Secondary School. I liaise well with fellow English teachers of the two other schools used in the study, namely Sunset Valley Secondary and Riverdale Secondary School. I ensure that my relationships with research participants, and fellow colleagues of the three English departments, were based on trust, professionalism and ethical considerations. I aimed to create a supportive environment where participants felt comfortable to express themselves honestly. I recognised that I was a fellow English teacher and their colleague and emphasised that I wanted to learn from them. However, I also knew that my own attitudes and experiences could have influenced how I generated and interpreted the data, which could have led to researcher bias. I was therefore extremely mindful of this potential impact on the research process.

To alleviate the impact of potential bias, I tried at all times to be open-minded and objective in my interactions with my participants, as well as my interpretation of the data. I also employed triangulation, which involved using multiple methods of data generation. This allowed me to gain a comprehensive understanding of the attitudes and experiences of the participants and enhanced the trustworthiness and rigour of the study.

## **1.9. Delimitations**

Delimitations are characteristics that limit the scope and define the boundaries of the study (Simon, 2011). This research study involved only three secondary schools, which are public schools, within the same district in Durban, KwaZulu-Natal. Not all schools in the neighbourhood were invited to participate. Given the constraints of time and requirements of

the degree, the study was delimited to a specific district that included public schools, and not private schools, which allowed for a measure of consistency in the socio-economic factors and infrastructure of the schools used. Only schools in close proximity of each other and who had some access to technological devices were recruited.

A small sample of 17 English teachers from the three schools was selected to participate in the study. Only high school teachers were chosen and only teachers who taught English were invited to participate. This helped to define the parameters of the study.

Since the study focused on teachers' attitudes and experiences, the methods of data generation were delimited to their voices via open-ended questionnaires, and individual and focus group interviews. It did not involve observations of lessons as that was not the focus of the study.

### **1.10. Organisation of the dissertation**

This dissertation is divided into six chapters:

**Chapter 1** introduces the research project and provides the rationale, motivation and purpose of the study. It then provides important background information and the context of the study. Thereafter, key studies from the literature, important terminology, objectives, research questions, and an overview of the research process are provided, followed by research stance, delimitations of the study, and an outline of the dissertation.

**Chapter 2** presents a literature review of related studies. This chapter places significance on conceptualising technology and technology integration in education including the benefits and barriers of technology in the classroom. The chapter also focuses on teachers' attitudes towards technology, how teachers' attitudes and experiences shape their pedagogical decisions, which focuses on firstly understanding what pedagogy is, teachers' beliefs and attitudes when using technology in the classroom, and the impact that technology has on pedagogical decisions. This reflects how studies from other countries that integrated technology in their classrooms yielded positive outcomes, but also posed challenges to teachers and schools that did not have these resources. The chapter also explains technology use in the English classroom.

**Chapter 3** begins by laying out the theoretical dimensions of the research, and explores the theories which are the Technology Acceptance Model by Fred Davis and Richard Bagozzi (1989) and Theory of Acceptance by John Dewey (1938), which support this study. These

theories were carefully examined in terms of teachers' attitudes and experiences when using technology in the English classroom.

**Chapter 4** presents a discussion of the research methodology that was employed to understand the attitudes and experiences of high school teachers when integrating technology in their English classroom. It also explained the type of schools that were used in the study and its location. It focuses on the research paradigm, research approach, research design, a detailed outline of the research process, and the recruitment and sampling. It then goes on to explain the process of obtaining ethical clearance, gatekeeper approval, as well as the informed consent letters provided to participants. The data generation strategies such as the open-ended questionnaire, individual interviews and focus group interviews are described, and the analysis of each data instrument, and the storage of data are explained. Finally, the trustworthiness and limitations of the study are explained.

**Chapter 5** presents the data and provides a discussion of the findings that emanated from the methods of data generation. The findings are presented, discussed, analysed and interpreted in line with the objectives of the study in order to answer the main research questions. The findings are woven into the extant literature and theories that underpin the study.

**Chapter 6** summarises the main findings of the research study, explains the theoretical, policy, methodological and professional practice implications, and highlights the limitations of the study. Areas for future research are provided.

## CHAPTER TWO

### LITERATURE REVIEW

#### **2.1. Introduction**

This literature review chapter aims to understand and highlight aspects central to the phenomenon being addressed through current findings on technology in education, and teachers' understandings, and experiences of technology use. Moreover, it presents insight based on technology that includes its origin, technology integration in education and the English classroom, positive and negative attitudes and experiences of teachers, how these lead to the usage of technology in their English classrooms, and how they shape their pedagogical decisions.

#### **2.2. Conceptualising Technology**

The term 'technology', comes from the combination of the Greek *techne*, meaning art or craft, and *logos*, meaning word or speech (Buchanan, 2020). When it first appeared in English in the 17<sup>th</sup> century, it referred to the applied arts only, and gradually these "arts" came to be the object being labelled. By the early 20<sup>th</sup> century, the term embraced a growing range of means, processes, and ideas, in addition to tools and machines. By the mid-20<sup>th</sup> century, technology was defined as the means or activity by which man seeks to change or manipulate his environment (Graddol, 1997). Reddy and Zhoa (1990) believe that, due to the vast range of disciplines, there is an increasing recognition that technology, particularly its dynamic nature, can only be understood in line with the different academic disciplines and contexts from which it emerges or where it is located, which results in different understandings and perspectives. For this reason, the Australian Academy of Technological Sciences and Engineering (ATSE, 2013) notes that technology may be viewed as the outcome of creative thinking or applying knowledge to solve everyday problems.

The dynamic nature of technology has contributed to the existence of various definitions and concepts of technology, which are crucial in understanding of the nature of technology and also examining what it comprises. Thus, the definition of technology is indeed vast, where many researchers have different views and definitions of it, which are presented chronologically. An

early definition, provided by Arrow (1962), points out that technology is always created by innovators and the technology needs to be easy to both reproduce and reuse. Sahal (1981) defines technology as being a configuration that relies on a specific set of processes and products, and Pavitt (1985) suggests that technology is mainly differentiated into knowledge about specific applications that form the basis of competitiveness. Shiowattana (1991) notes that, not only does the process of technology involve the transmission of knowledge, but it also relates to a learning process that allows for the transfer of knowledge to eventually lead to a deeper and wider accumulation of knowledge. While technology today includes computers, the internet, and various devices, amongst others, technology literacy involves evaluating, analysing, and being able to use such technology with ease (Burgelman et al., 1996). As indicated by Burgelman et al. (1996), technology refers to the theoretical and practical knowledge, skills, and artefacts that may be used to develop products and services as well as their production and delivery systems. Kumar et al. (1999) point out that technology involves physical and informational components.

Unlike Arrow (1962), Tihanyi and Roath (2002) note that technology produces information but that information is not easily reproducible and transferrable. Researchers Chan (2002) and Grubler (2003) note that, whilst some view technology as being just a computer, it can be regarded as machines, gadgets, and computer devices. Maskus (2003) broadens the notion of technology by defining it as this. The information necessary to achieve a certain production outcome from specific means, where a combination of processes takes place. Maskus (2003) notes that, while technology is associated with machines such as computers, software, aircraft, and other technological devices, for the machinery to be used successfully, a great deal of knowledge, design, skills, engineering, and manufacturing expertise are required, which also fall under the large concept of technology. Barak (2004) points out that technology constitutes the application of knowledge to the practical aims of human life or to changing and manipulating the human environment.

A concise definition is provided by Safdar et al. (2011), who indicates that technology does not only encompass tools and machines but also embraces the impact it has on processes and systems, whereas Wahab et al. (2012) categorises technology as hardware and software and as being dynamic to an individual and environment. Santana et al. note that “Technology is considered as being one of the major driving forces in fostering economic growth, sustainable development and valued development in education” (2015, p.425). Maree and Vos (2021) meanwhile define technology as a science that encompasses the systematic study of the

structure and behaviour of the physical and natural world through observation and experimentation, which can then be applied to technology in the development and use of technology. Hence, the idea being conveyed is that technology not just encompasses scientific knowledge, but also skills and values developed over time to serve practical purposes. Existing technology is constantly replaced or upgraded by newer technology (Cloete, 2017), as technology has placed a great emphasis on how businesses have revolutionised how we work in our everyday lives, as well as the way in which we communicate. Steyn et al. (2017) also emphasise that, with the theory behind the technology, it is important to note that technology involves a wide range of machines and instruments, which are the hardware devices consisting personal computers, projectors, scanners, and digital cameras that allow for global access to knowledge, allowing not just schools to develop, but businesses and the economy as well. Chau and Nguyen (2021) describe technology as the interrelationship between humans and machines and their environment, where people prefer the application of appropriately technical processes to their practical day-to-day tasks. McLaughlin (2021) defines technology as the use of scientific knowledge, skills, and values to serve practical purposes, which includes hardware such as machines, as well as other types of mechanical devices, particularly those that help man to live with greater ease and comfort.

Based on the various understandings of technology, as presented above, I understand that technology refers to the technical means that people use to improve their surroundings and their ability to do work in which they find new and better ways of doing things. I believe that it is the application of knowledge to meet the goals, goods, and services that are desired by people because the term technology, of all kinds, holds an important place in society, where it is only natural that it will be associated with knowledge and development, particularly in the field of education.

It is evident that technology has altered not just society on a global level over the years, but this change has also increased the demand for competent workers in the business world and has greatly impacted the education system. The term "technology" as highlighted above, can be used to mean a wide variety of things from pencils to computers. Therefore, in this research study, we use the term to refer broadly to computer-based tools that are hardware and software associated.

The use of technology to enhance teaching and learning is becoming increasingly predominant as several technological developments have touched every aspect of our lives (Mdlongwa, 2012). Due to the speedy advances in technology, keeping up with such developments and introducing the latest technology in all areas of life become important.

Technology plays multiple roles across all fields of work, due to its rapid evolution over the past two decades (Almutawkki et al., 2018). In this technological era, as mentioned by Almutawkki et al. (2018), the application of technology has eased life for many people who are now becoming familiar with technology in various fields of work, especially in the field of education, in which it has proven its effectiveness in methods of teaching. Technology provides room for authentic teaching and learning as young children and teenagers are usually digital natives. Almutawkki et al. (2018) argues that technology is not only bound to the workplace but is also found in almost every transaction of our daily lives. Haert and Laher (2015) corroborate this by pointing out that young people, including learners, have found technology highly appealing, and given a chance, they engage with it most often for their personal or educational purposes of life.

Technology not only deals with the past conceptions in which technology was used to enhance activities in the workplace, technology, in the context of the study, means looking at alternatives and innovative ways of introducing strategies to improve the quality of teaching and learning in an educational setting, and where teachers' attitudes play a crucial role in the successful implementation of technology in the classroom (Fu, 2013). Technology keeps evolving and utilising hardware devices, such as machines in teaching and learning enhances teaching and learning (Picker, 2020).

According to Dudley (2010), digital technology has revolutionized since the late 1980s as the adoption and integration of advanced digital technologies means that we are moving from a traditional way of life to a more modern way of living. In its earliest use, digital technology primarily focused on computers and related devices that processed digital information (Shannon & Weaver, 1949). Digital technology began to expand beyond large mainframe computers to include personal computers (PCs) and early digital media which was tools that could be used at homes and offices (Negroponte, 1995) and shared a view of digital technology as transforming and, accessible and shared which advanced into digital communication and digital media.

In this 21<sup>st</sup> century, the term technology is an important issue in many fields including education because technology integration has gone through innovations and transformed our societies which has changed the way people think, work and live. The integration of digital technology in education, also known as Information, Communications and Technology (ICT) refers to the usage of computer based technology incorporated into classroom practices (Dudeney, 2010). Technology in education, known as Information, Communications and Technology (ICT) refers to the digital use of systems to support and enhance the delivery of educational content, facilitate communication and collaboration and improve learning outcomes which encompasses a wide range of technologies including computers, mobile devices, educational software, the internet, interactive whiteboard and online learning platforms (Anderson & Dron, 2022). ICT education is an ongoing evolution, expanding the role of technology in education all the time.

### **2.3. Technology Integration in Education**

We see the world in constant state of change as it is moving into 4IR (Penprase, 2018). Central examples of such technologies that will dominate in the years to come, according to Penprase (2018), are artificial intelligence, biotechnologies, and nanomaterials. However, the rising gap in knowledge regarding technology in schools and classrooms raises questions about the preparation of future generations to thrive in the technological era that has arrived (Department of Science and Technology, 2019). According to Schul (2015), significant changes have taken place due to the emergence of technology integration in education, which has provided new opportunities for teaching and learning. Moreover, technology integration in teaching plays a vital role in attaining a significant improvement in the productivity of the lesson by the teacher and the performance of the learner. The integration of technology in educational institutions has many promises, including the promise to offer educators the means to engage in collaborative teaching and learning (Otterbreittleleftwich et al., 2013).

In the education sector, technology integration started gathering momentum in 1994, and has continued, where schools have transformed in the past two decades (Hofer & Swan, 2011), but studies have established that technology integration into classroom instruction is a slow and complex process, influenced by many factors, including the amount of support a given technology requires (Inan & Lowther, 2010). However, Broekhuizen (2016) states that even though it may be a slow complex process, there has been a great transformation and the aim is

to redress the imbalances in the education sector that may exist. He notes that this transformation has brought about the use of various technological devices in a classroom and it has helped to develop lessons among teachers and learners.

Today, the use of technology has become a necessity, not a privilege, because technology is included in almost every area of life. Technology integration with continuous development and change of technological devices continues to be one of the most important reforms in education (Inan, 2010). While there is no clear definition of technology integration in education due to the ever-changing nature of technology and its different perspectives, it can be understood, according to Belland (2009), as a process that contributes to learners' learning and supports the teaching process of the teacher in the classroom setting. According to many researchers (Polly et al., 2009; Abbitt, 2011; Liu, 2011; Kopcha, 2012; Pamuk et al., 2013; Mozejko & Caputi, 2015), the concept of technology integration has been associated with supporting ideas, such as professional development, subject area knowledge, self-efficacy beliefs, attitudes, and pedagogical beliefs for teachers. Researchers, Ntuli and Kyei-Blankson (2012) define technology integration as the use of various digital hardware to facilitate the process of learning in the classroom. This means that integrating technology in education allows the teacher to permit a type of learning that is fast, modern, and flexible. Similarly, Naicker et al. (2013) view the importance of human resources, via the teachers in the school, as assets and the non-human resources, which includes technological resources such as tablets, computers, overhead projectors, and audio-visuals, among others, as essential requirements for teaching. Technology integration, according to Kirschner (2015), becomes a new competency, seen as a catalyst for change in classroom processes, which provides a distinct departure and change in the context, which suggests alternative ways of operating. Kirschner (2015) goes on to say that teaching in a technologically advanced classroom involves a combination of complex, cognitive and hi-order skills, highly integrated knowledge structures, enthusiastic attitudes, and values. Hence, these are characteristics that a 21<sup>st</sup>-century teacher ought to possess when integrating various methods of technology into education. Consequently, teaching and learning in today's classrooms ought to transform itself in order to meet the changing demands of society (Anderson et al., 2015). Thus, teachers ought to remain abreast of the shift from the traditional instructional approach, which is the use of lecture-based learning that delivers the content verbally to the learners, who listen and take notes and this emphasises teacher-centred instruction, the chalk and talk method of teachers using the chalkboard to write, draw and explain while talking through material in textbooks and worksheets and textbook-centred

instruction is heavily reliant in these schools because it is learners primary source of information where they note-take and complete exercises from the textbooks This modern approach of teaching with technology is seen to be a more eclectic set of teaching and learning activities that include positive knowledge building for both teachers and learners (Anderson et al., 2020).

Research by Anderson et al. (2020) has called for innovative ways to integrate technology into class lessons, and according to Bray and Tangney (2017), these innovative methods of technology integration have highlighted technology as a mediator for learning. Anderson et al. (2015) support this statement, and remind us that technologies of the current industrial revolution, such as computers, smartboards, and tablets have created an exponential shift in education not seen before. While Panakaje's (2024) study notes that technology integration can lead to an interesting pedagogical change, Levin and Bruce (2001) highlight that technology integration in classrooms needs to note the context, engagement between learners and teachers, and the effectiveness of technology use. It also becomes clear that technology integration in classrooms involves technology literacy and hands-on skills (Bugliarello, 2000), which enables teachers and learners to seek, analyse and evaluate information, as well as to create and make decisions about it.

For many years, there has been an increasing interest and revolution in technology use in the classroom, which has offered better ways to explore both teaching and learning (Shyamlee & Phil, 2012). Not only are the youth using the internet more, but they are also doing so at younger ages, and Hooft-Graafl (2018) indicates that pre-schoolers become familiar with digital devices before they are exposed to books. Researchers Eady and Lockyer (2013) highlight the importance of technology education for the teaching profession which facilitates learners' learning, which has become an integral part of the teaching and learning experience. Drijvers (2013) echoes similar attitudes, where the role of the teachers, pedagogical design of the tools, and the educational context have been identified as those factors governing the integration of technology in primary and secondary education settings. This indicates that these parameters point toward the radical change needed within the modern educational system, positioning teachers as information brokers and facilitators of learning, and learners as independent actors in the pursuit of learning (Farjon et al., 2019). A study by Mthethwa (2015) affirms that technology today cannot completely replace the fundamental roles of a teacher in the classroom but can, however, maximise the experience of learning for learners, which helps both the teachers and learners to better familiarise themselves regarding their subject areas. The findings

in this particular research study are significant, because technology was not treated as a separate entity. Nor do teachers want to be undermined by technology in the classroom; instead, technology use in the classroom was used to enhance the lessons. Similarly, this research study aimed to understand, from teachers' perspectives, their attitudes and experiences when they used technology in their classrooms, and whether teachers felt dominated by technology, or whether it enhanced and complemented the lesson.

According to Prasojo et al. (2018), technology in education ought not be considered a replacement for face-to-face instruction of the teacher, but rather, as a support to attain objectives that have not been attained efficiently. It also assists in preparing older and younger generations for a technology-driven future. Consequently, there are benefits to technology integration in education.

### *2.3.1. Benefits of Technology Integration in Education*

An enhanced learning environment may be created for learners when the technology used in the classroom provides a motivating learning environment and opportunities for learners' constructive engagement, resulting in learners reaping pedagogical benefits (Prasojo et al., 2018). Technology may be seen as a powerful tool to supplement teachers' instruction in the classroom and if used properly by teachers, technology may foster interest in learning on the part of learners (Farjon et al., 2019). For teachers, Farjon et al. (2019) believe, technology has the potential to make instruction easier, more challenging, and more motivating for teachers. Apart from classroom instruction, teachers are also involved in class administrative duties, and technology is seen as an effective administrative tool for teachers in activities such as the use of learner record keeping, lesson planning, preparing handouts, tutorials, and slides, preparing exams papers, marking papers and recording of results and performing statistical analysis on marks (Farjon et al., 2019). Therefore, apart from classroom instruction, technology can become an extremely useful tool in the handling of several administrative tasks for teachers.

Technology may also prove beneficial to increasing access to education and inclusive education in schools (Mthethwa, 2015). Mthethwa (2015) notes that integration of all learners, regardless of their cultural, racial, and socio-economic backgrounds, as well as their strengths and weaknesses in any area, can be made possible through technology, which can help schools achieve the goal of equal access to education. Prasojo et al. (2018) note that technology has also presented schools with an excellent medium by means of which to share ideas and experiences as a communication platform, where learners, teachers, and administrators may

communicate, exchange knowledge and concerns, meet experts and peers, and share work in collaborative projects. Such initiatives enable learners' knowledge and skills related to computer use, which empowers them with the computer literacy and computer skills needed as basic requirements for securing jobs, and for a nation to compete for a share of the global market (Mthethwa, 2015).

Thus, it is evident that the effects of integrating technology in classrooms has a positive effect on learner learning, quality of education, and sustainable development and should be a prerequisite for progression in the education sector (Uwasu et al., 2009). This research study aimed to find how teachers perceive technology on learner learning and quality of education and how technology contributes to educational progression, if at all. While schools and teachers may be committed to integrating technology in education, they may encounter barriers.

### *2.3.2. Barriers to Technology Integration in Education*

Emre (2019) presents the following barriers, which are categorised according to external (first order) and internal (second order) factors. First-order barriers include external factors such as access to technology, time, support, and professional development training, and second-order barriers are internal factors, which are teachers' confidence in using technology, and their belief in the usefulness of technology use in education (Emre, 2019).

In terms of external factors, Hechter and Vermette (2013) report that the main obstacles preventing teachers' technology integration are lack of resources, including equipment, lack of time, lack of or poor training opportunities, and lack of funding and poor administrative support. With limited access to technology, teachers may not perceive it to be positive or useful in their schools. In agreement with this, Prasojo et al. (2019) found that school principals' perceptions of technology are shaped by external barriers to integrating technology, which include a lack of funding, and a lack of professional development. They note that principals are similarly affected by technology integration as teachers. In their study focused on technology integration in the Foundation Phase, Nikolopoulou and Gialamas (2015) worked with 134 teachers within a particular school district, and found that a lack of funding, technical support, administrative support, training, equipment, and access to the equipment reduced the level of teachers' technology use. The lack of technological equipment, a dearth of computer laboratories, and internet connection problems constituted some factors that affect technology integration in the classroom negatively. The research concluded that a lack of in-service

training, equipment, technology plans, appropriate software, and computer laboratories constitute some barriers reported by teachers. Kilinc et al. (2018) found in their research with teachers, that a lack of technology, access, and administrative and technical support constituted major barriers to integrating technology. In addition, it was found that, despite professional development in technology use, certain teachers were unwilling to integrate technology into their classrooms, due to their lack of interest and motivation.

Internal factors, such as a lack of teacher confidence, resistance to change, lack of vision, lack of teachers' knowledge, and dependence on traditional teaching styles, serve as internal barriers to technology integration (Prasojo et al., 2019). Aslan and Zhu (2015) and Kimmons and Hall (2016) share the same belief that, although many teachers may want to integrate technology in their classrooms, they are faced with a barrier in that they believe they do not have enough knowledge to use technology effectively, and they lack self-efficacy for integrating technology in education. The lack of ability and confidence are factors that affect technology integration in education and teachers' technology integration practices affect their beliefs about effective ways of teaching. Kimmons and Hall (2016) state that, if teachers have technology integration experiences in education, their level of technology use increases as they feel more comfortable, which in turn affects their success in integrating technology. However, a lack of comfort with technology is seen as a barrier to technology integration.

It is therefore evident that, while technology integration in schools may provide many challenges to both the teacher and learner, schools should address such to enable proper planning and policy making. Researchers Chan (2002) and Dudney (2010) indicate that both policymakers and researchers ought to share the same insights for the future development and integration of technology, so as to keep up with relevant methods of teaching and learning and to provide a vision of how the education system should run. While an idea may be theoretically compelling, it also needs to bear out its practicality in concrete terms. In South Africa, it has been noted that the government has initiated and invested in technology-based tools for teaching and learning, such as upgrading the school infrastructure and equipment to help accommodate technology integration (Ramorola, 2013). However, despite these initiatives, several South African schools are not integrating technology into their lessons (Ramorola, 2013). This implies that teachers need to either find their own methods of integrating technology into the classroom or resort to traditional methods to teach. In a study by Chapelle (2011), it was concluded that infrastructure and technological devices need to be supplied to schools by providing sufficient computer laboratories and devices for teachers to utilise in the

classroom. Without infrastructure, equipment, and internet access, teachers cannot be expected to integrate technology.

#### **2.4. Teachers' Understandings and Experiences of Technology Use**

The continuous and increasingly rapid development and implementation of technology over recent decades constitute distinct features of modern societies, and have been playing a key role in creating and exchanging knowledge and information around the globe. Hence, the need for the acquisition of technological skills and knowledge form part of the core education for which every school should aim and for which all teachers ought to strive (Srivastava, 2016). In the last decade, many countries have redeveloped their curricula so as to include technological concepts that are designed to make the practices of teaching for teachers more efficient and valuable, and enable learners to contribute to and benefit from an all-inclusive and sustainable future (Varoy et al., 2021).

Teachers are a pivotal component in the field of education, as they adapt to the ever-changing curriculum and demands of 21<sup>st</sup> century teaching and learning by being agents of change (McDonald, 2003). Teachers continue to be important providers of educational sustainability, and should be able to adapt themselves to the rapidly developing technologies that apply to all learning environments (Bentham, 2013). Importantly, Bentham (2013) adds that technology does not teach, but instead, it is the teacher who teaches, and even though teachers need to keep up with changes, such changes should not significantly change their roles in the classroom. Ortega and Fuentes (2015) argue that many teachers' understandings and experiences of technology are based upon their limited access to resources, the time needed to set up the technology, which results in limited teaching time, their lack of necessary technical skills, and a lack of professional development in the field, which results in their lack of knowledge. This indicates that teacher efficacies also play an essential role in determining their use of technology.

However, many studies attest to teachers' positive experiences of and attitudes to technology. A study by Coklar and Yurdakul (2017) with 186 teachers, found that when teachers used the traditional methods of teaching, learners forget the content in a short space of time. When visual elements are introduced in conjunction with verbal instruction, the verbal and visual elements increased learners' interest, as they were attracted to the visual content. The teachers noted that the use of technology had helped to develop the lessons actively and improved retention. Not

only did the richness of the technological content benefit the learners, but teachers also became interested in the content available from so many online sites. As Davis (1989) notes, technology use assists in activating learner participation, the materials chosen enhance lessons, and learners' performance improves, resulting in active learner participation through the use of technology. In addition, Prestridge (2012) emphasises that technology in the classroom is important because, while it helps support current classroom learning, it also prepares learners for living in a society permeated with technology.

In a 2017 study by Li, teachers experienced technology as a developmental process that promotes a more innovative type of teaching. The sample of senior secondary teachers indicated that making use of technology not only promoted a variety of instructional purposes when teaching, but also fostered greater learner and teacher engagement, as well as collaboration with peers and experts beyond the classroom. Siefert et al. (2019) found that teachers' understandings and experiences of technology were positive and they believed that technology enhanced learning and encouraged the differentiation of methods of learning styles. Teachers were also positive about technology, which was driven by the fact that their technological devices were embedded in their classrooms. However, they suggested that teachers be given the support, in the form of instructional coaching and time to practice, to enable comfort and ease of use of the devices, as many teachers did not know how to fully use devices in their classrooms.

However, Siefert et al. (2019) also found that a teacher noted that technology use can become monotonous over time, and that learners may find it to be boring. Similarly, the study by Prince (2017), with 76 elementary school teachers using open-ended questionnaires, found that while they found technology to be useful, they experienced how easily learners could become distracted by technological devices. The suggestions from the study was that teachers not make the lessons monotonous or rely on one type of device, but that they ought to utilise as many teaching strategies as possible.

Stover et al. (2015) caution researchers to understand that, even though technology in the classroom provides an interactive approach between the teacher and learner, it is important to note that many schools around the world do not have or have limited access to technology in their classrooms, and therefore, experiences and uses for these teachers will be ill-conceived. These researchers point out that teachers' experiences have been largely based on how effective their technology integration has been for them, their knowledge during the introduction and

usage of these devices, and whether the curriculum emphasizes the usage of technology. Prince (2017) agrees, noting that teachers' experiences and usage of technology are based on policies that enable technology integration, including the availability of resources and the support that teachers receive when integrating technology in their classrooms.

Further, Hixon and Buckenmeyer (2009) point out that, when considering the experiences of teachers, it is important to understand the hardships that often accompany the usage of technology in their classes, at the initial stage of technology integration. Some of these challenges include the limited number of devices available, necessitating sharing of equipment. In addition, teachers noted the time it took to set up devices and prepare the class environment, resulting in a loss of teaching time, and a failure to complete the curriculum. Another study also found that teachers experienced the introduction of technology in their lessons to be time consuming due to the set-up, requiring of new knowledge, and requiring of additional lesson preparation (Drossel et al., 2017).

A 2020 study by Geldreich and Hubweiser found that teachers are also constantly required to develop new knowledge and understandings of technological concepts, with very little knowledge and support on which to base this, and this becomes a challenge. Van der Vlies (2020) agrees with this statement as, during the coronavirus pandemic, teachers lacked familiarity with technological devices as well as access, and this impacted remote teaching and learning, indicating that technology usage is still fraught with challenges faced by many teachers and schools. Researchers Cheng and Xie (2018) indicate that teachers' experiences of technology use determine their use and point out how teachers are influenced to not use technology due to their lack of resources, time constraints, as well as low confidence levels. Due to these experiences of teachers, many find this approach to teaching irrelevant. Goetz (2020) agrees with Cheng and Xie (2018) to note that a lack of support from schools in the implementation of technology resulted in many schools and teachers not being interested in moving forward with newer methods, and resorted to the simplest and least time-consuming methods of teaching. This indicates that the understanding of teachers' use of technology is based on their experiences, as well as from the studies cited, it can be seen that if teachers' experiences are not favourable due to the many challenges that they face when implementing technology, or indeed due to the lack of resources they may have, they will reject the prospect of using it. Pittman and Gains (2015) show that the experiences shared by teachers' point to a negative experience, as teachers experience a great deal of stress when they feel a lack of support, resources, and limited time for the lesson. Researchers Johnson et al. (2016) shared

that negative experiences will continue if teachers' challenging experiences with technology are not dealt with accordingly. Even teachers who have access to technological devices may not be trained in their use. George and Sanders (2017) agree that ongoing professional development is required for teachers so that they may refine and build on their knowledge of technology.

A different dynamic was identified by Margot and Kettler (2019), who found that teachers based their technology usage experiences on their years of teaching experience in the field, where, if they had been reliant on the use of traditional methods, they wanted to continue using the methods that worked for them. Their experiences with technology were usually not favourable, and these teachers chose to continue with their chalk and talk methods. It is possible that increased support and training could assist such teachers.

Researchers Erdemir et al. (2009) recognise that common problems faced by teachers need to be alleviated so that they may be equipped with the knowledge that will enable them to utilise technology. Teachers hold the belief that support plays an integral part during the integration of technology into classrooms, particularly from other teachers and the institution itself (Ertmer, 1999). A school that provides resources, together with training workshops, so that teachers may understand how to operate devices in the classroom, assists teachers greatly, and the provision of materials aids in such support. Ortega and Fuentes (2015) emphasise that leadership and technical support from the school are pivotal to ensuring success in the classroom. In order to overcome the challenge of time wastage, Eristi and Kurt (2012) found that, as teachers adapted to technology use in their classrooms, they began to find methods to adjust. For example, learners would assist in the setup upon arrival. Learners were also involved in assisting teachers when problems arose, such as software installation, or any technical issues, which gave learners the chance to showcase their skills, thereby allowing for a more positive approach to these experiences and uses. Li (2017) agrees that technology is here to stay, and that teachers need to participate in professional development to boost their confidence when they are using technology in their classrooms, including finding methods to best suit their challenges.

## **2.5. Teachers' Attitudes Towards Technology**

Attitude, according to Alzaidiyeen and Fong (2010, p.213), can be described as a “mental and neural state of readiness that is organised through experience, exerting a directive or dynamic influence upon the individual’s response to all objects and situations with which it is related.”

Moreover, this will either result in positive or negative emotions. In terms of teachers’ attitudes to technology, a positive emotion will leave teachers with a more exciting teaching experience, while a negative emotion will result in teachers feeling less competent in technology and the nature and delivery of the lesson will not be favourable to them (Cahyani & Cahyono, 2012). Therefore, teachers’ attitudes are considered to be crucial for the effective use of technology in educational settings. In an educational context, the frequent adaptation to technological changes will generate an increase in demand of the personal and professional resources of teachers, increasing the complexity and overload of their activity (Yu et al., 2017), where this can result in resistance and defensive attitudes towards such changes.

In the context of technology in education, Autio et al. (2019) note that attitudes toward technology are based on a person's beliefs about it, and those beliefs can influence the behaviour of use and the attitude to use technology, which may either be a positive attitude or negative one. The teacher is ultimately responsible for ensuring the efficacy and sustainability of changes that take place in the classroom, including the introduction of technology (Zoch et al., 2016), where achieving a meaningful use of technological devices in education may be influenced by many factors, including the attitude of teachers, which will determine the use and acceptance of technology in the classroom. In addition, the success of technology use in educational settings is dependent on teachers' attitudes and use (Albirini, 2006; Baylor & Ritchie, 2002). Thus, the attitudes of teachers are considered a major predictor of the use of new technologies in educational settings, and will determine their utilisation of technology in their classrooms (Gray et al., 2008).

According to Mustafina (2016), a teacher is able to display a positive attitude toward technology when motivated, and knowledgeable about how to integrate technology into the classroom learning activities. Thus, teachers’ attitudes are crucial in determining the role and effectiveness of technology use in the classroom and the attitudes will ultimately influence how teachers implement technology in their classes (Ertmer, 1999). Eickelman and Vennemann (2017) refer to teachers as technology enthusiasts, as they were very positive about using technology in their classrooms. Not only was it an advanced way of teaching, but it assisted

teachers in their planning and development of their lessons. These teachers indicated how they were able to access better resources for their learners and themselves, instead of being reliant on merely a single resource such as the textbook, and this provided a more detailed understanding of concepts for the learners to grasp more easily. These teachers also felt that having these devices embedded in their classrooms was of great help, because, as time progressed and they started to get much more comfortable with using these devices, set-up time was reduced. Their learners were constantly engaged and teachers noticed significant improvement in learners' understanding.

Serin and Bozdag (2020) found that utilising technology in the classroom was of benefit to both more-experienced, senior teachers and less-experienced, younger teachers. Both showed an equally positive attitude to using technology to enhance their learners' learning. Factors such as the type of technology used, age and gender did not affect the findings as the teachers were aware of living in a technologically advanced world and the need to keep up with that world. The study found that teachers understood that they needed to be agents of change and innovation and to continue developing their teaching methods and styles. The teachers also emphasised that the more professional development they received, the more confident they became; which in turn resulted in a positive attitude to technology.

Thus, teachers have been shown to realise the tremendous potential that technology brings to the classroom, and they understand how it shapes their motivation and attitude to want to use it to enhance their teaching and learning (Voogt, 2012). In Voogt's (2012) study with 12 teachers, it was found that teachers who use technology extensively in their lessons tend to have a high level of confidence when teaching and learners, are more engaged, and have a very positive attitude towards technology. The teachers who utilised technology often showcased professional development activities and collaboration with those colleagues that did not use technology often. It becomes clear that teachers are aware of and acknowledge the proliferation of technology, are trying to ensure that their learners have the necessary skills to function once they graduate, and therefore feel very positive about using technology in their classes (Prestridge, 2012). For continuous positive results to be achieved through the use of technology, the attitudes of teachers have to be such that they are open to learning more about technology and experimenting with its use in the classroom (Prestridge, 2012).

Other studies likewise show that teachers have a positive attitude to technology, perceiving it to be advantageous in helping them organise their work and with lesson preparation which then

saved time and effort (Alzaidiyen & Fong, 2010). However, a study by Ndibalema (2014) in Tanzania with 80 teachers across ten schools found that, while teachers had a positive attitude towards technology, they believed that technology needed to be used at secondary school levels as older learners can better comprehend and understand lessons better using technology.

The findings by Mustafina (2016) in a Kazakhstani secondary school indicated that teachers' technology use and integration in their classrooms were positive, as every teacher reported observing the necessity technology to their practice. The research also identified factors such as teachers' confidence, which played a major role in determining their attitudes as many of these teachers possessed high confidence levels and motivation to want to use technology. The age category was also considered, as both experienced and new teachers were part of the study. Initially, younger teachers felt comfortable using technology, whilst the senior teachers did not want to use it. However, as teachers were eased into using technology and became skilled in doing so, they did not require additional technical training. The study also showed that teachers who displayed an enthusiastic attitude towards technology lead learners to becoming likewise motivated in that regard, enjoyed lessons more, which ultimately impacted positively on their performance. Musafina (2016) notes that even if a teacher had experienced some sort of challenge in his or her classroom, learners assisted in creating a friendly and helpful atmosphere, which helped teachers feel secure when troubleshooting was required.

In a South African study, MacFarlane and Woolfson (2013) worked with 64 teachers in nine Cape Town schools. The study found that teachers had positive attitudes towards technology use, as they knew that technology is developing rapidly, and that children growing into teenagers are highly dependent on such devices. These teachers also reflected on their attitudes based on their successful experiences with technology, where each teacher felt that they had gained confidence through the continued use of technology. They learned the necessary skills and competencies to use in their teaching and highlighted the significant positive changes they had seen emerge from their teaching methods. While the teachers' professional development was growing, a senior teacher who did not receive the support expected from the school management, shared how the learners in her senior class provided her with professional development sessions (during the break, every day). The teacher called them 'experts' and they helped build her self-confidence as well as her understanding of the devices in her classroom. While her attitude was initially negative, the teacher made the effort to learn how to use the technology and ultimately felt more confident.

In another South African study, Hart and Laher (2015) worked with teachers in Johannesburg and, using open-ended questionnaires and individual interviews, found that teachers had a positive attitude towards the use of technology. These teachers had sufficient educational technology access such as the necessary devices that could be used in the classroom, teachers were provided with training courses so as to better their understanding of how to use such devices in the classroom, and they learned innovative ways to improve themselves in the classroom. Teachers were also eager to continue with these training courses as their schools provided these facilities of training as part of their teacher development. These teachers also indicated that the use of technology allowed them to choose the most necessary and relevant information for teaching instead of being drawn to textbooks only. The two methods of data collection provided rich and in-depth information on teachers' attitudes towards technology use.

While many studies cited show teachers' positive attitudes towards technology use and integration, there are some studies that indicate otherwise. In a study by Oju and Adu (2018), teachers pointed to the lack of availability of technology in their schools and classrooms, lack of support from administration in need of training and technical support, and the time it takes to set up and integrate technology in their classes. Such factors result in a negative attitude towards technology. Similarly, the teachers in the study by Ertmer (1999) were concerned that learners might need to share devices, which would not be appropriate when individual learning is required. A 2020 study by Alvarado et al. held in public schools in America meanwhile found that there is inequality in school resources, as certain schools have limited support and resources for teachers. The inequality creates a negative attitude as teachers recognise the differences in resources. Bahia et al. (2019) indicate that, even though many governments have made provisions for and investments in technology, the allocation remains unequal, which can cause grievances amongst neighbouring schools. While teachers felt the pressures and high demands of integrating technology into their lessons by school management and the government, their attitudes were largely based on the challenges of integration, such as lengthy set-up times, poor connectivity, uneasiness in delivery of lessons, and lack of professional training. Teachers also did not want technology in the schools and classrooms, due to the theft of resources and the obligation of paying for or replacing the devices. The participants in this research study highlighted that the majority were senior teachers who relied on their chalk and talk methods and textbooks, unlike more technologically advanced and technologically

qualified teachers, who qualified from universities with technological experience and knowledge which affected their confidence.

## **2.6. How teachers' attitudes and experiences shape their pedagogical decisions**

McCulloch et al. (2018) note that what teachers believe about teaching and learning impacts their behaviour in the classroom. Identifying teachers' beliefs and what drives the enactment of beliefs are necessary to understand the decisions that teachers make within their classrooms. Their attitudes and experiences tend to determine their teaching methods. Thus, there are teachers who understand the importance and usefulness of modern educational technologies, which surpass the use of traditional instructional aids (Spector, 2016). Such teachers understand that learners need to be proficient at using technologies to adapt to the rapidly digitising globe, and should have the opportunity to use technologies at an early stage in life to prepare them for future use. However, Tondeur et al. (2017) emphasise that teachers must be the prime movers in teaching this to young learners, by integrating technologies into their pedagogies, and using them not just as visual aids but also as a tool of engagement.

### **2.6.1. Understanding Pedagogy**

To understand how teachers' attitudes and experiences shape their pedagogical decisions, it is important to understand the term pedagogy. The term pedagogy has various meanings and understandings and, depending on the type of instruction utilised in a classroom context, is highly contested (Price-Rom & Sainazarov, 2010). An early definition of the term 'pedagogy' provided by Bernstein (2000) is a sustained process in which a person acquires new forms or develops existing forms of conduct, knowledge, practice, and criteria from another person and this is a continued effort to enhance the learning of the individual. Another definition of pedagogy by UNESCO (2005) indicate that it includes activities that evoke changes in learners, in which the type of activity that is designed by one person enhances the learning of the other. Price-Rom and Sainazarov (2010) note that effective pedagogy in the 21<sup>st</sup> century refers to teaching and learning activities that make observable changes in learners and that lead to a greater understanding, engagement, and measurable impact on learner learning. However, these researchers highlight that this type of effective teaching and learning can only take place when the school also supports teachers' pedagogical decisions by providing teachers with the

adequate resources and support they need for effective, competent teaching to take place. Similarly, Black and William (2018) found that the most common terminology associated with pedagogy is competence, excellence, or failure in teaching methods. Such concepts are closely related to the attitudes and experiences that shape teachers' pedagogical decisions.

### **2.6.2. Teachers' pedagogical beliefs and attitudes when using technology in the classroom**

As established, the use of technology has become a fundamental requirement in many parts of the world. Technology is recognised for its potential to transform the practices and performances of teachers to help their learners to learn in a more effective way (Oyunge, 2021). Teachers' pedagogical beliefs and attitudes toward technology affect their utilisation of technology in teaching (Prestridge, 2010). This means that teachers will bring their pre-existing beliefs about teaching pedagogies into the classroom along with their knowledge, skills, and attitudes, which will determine their use of technology as part of their pedagogical practices. Li (2014) notes that the integration of technology in the classroom depends on the extent to which teachers like these devices, which would impact their attitudes and belief to continue using them.

Similarly, Cuban (2012), recognises that, when teachers utilise the diverse range of technology in their classrooms, this creates an atmosphere of innovation, confidence and freedom, as it allows learners the liberty of learning through discovering the advantages that technology brings to the classroom. Researchers such as Konig (2012), Lehtinen et al. (2016), and Tondeur (2020) share the same sentiments as Cuban (2012) regarding teachers' pedagogical beliefs about technology use in their classrooms. They note that the effective use of technology, when integrated into their classrooms, provides an advantageous way of teaching and learning for both teachers and learners. Hence, the beliefs of teachers largely determine how and why teachers would develop new teaching methods and instructional practices that include technology. However, Crompton (2013) challenges this idea by pointing out that the beliefs of teachers may be dynamic, as what may be perceived as advantageous may not necessarily work for all teachers, and in terms of technology, such beliefs could determine technology integration. Theoretically, the change in pedagogy for teachers is ideal, but in practice, the opportunities offered are highly limited to many teachers when practicing in their classrooms, and this determines their attitude toward integrating technology (Zheng & Huang, 2014). This indicates that teachers' pedagogical beliefs can be perceived as both barriers or enablers of technology integration.

Researchers Tondeur et al. (2017) note that, before teachers decide on using technology in their classrooms, their pedagogical decisions are affected by the external and internal barriers they face. There is a close relationship between teachers' beliefs and attitudes and their pedagogical decisions regarding technology use, but if teachers were given appropriate access to technology (Tondeur et al., 2017), this could lead to a more frequent adoption of technological devices in their pedagogical decisions. Consequently, Tondeur et al. (2017) state that, along with these barriers, there are also enablers that are seen as the reasons why teachers would want to integrate technology into their pedagogical decisions. They note that the school plays a fundamental role in the use of technology in the classrooms and the support that the teachers receive encourages them to integrate technology into their pedagogies, thereby pointing to the need for support and access. Tondeur et al. (2017) point out that there needs to be a shared vision amongst all teachers to create a friendlier, supportive, and positive environment of technology utilisation. The more teachers show a favourable attitude towards technology, and the more teachers believe in the positive effects of technology use, the more likely they are to use it. Problems may arise among teachers regarding technology use based on their learning styles, and school administrators need to monitor and support teachers navigating such problems.

### **2.6.3. The impact of technology on teachers' pedagogical decisions**

Teachers need to familiarise themselves with the various types of technological devices available, which could help them recognise the pedagogical possibilities through technology (Dong & Newman, 2018). As technology continues to advance, teachers' professional development needs to continue as well, and teachers need to be willing to constantly develop their pedagogies related to technology. Their pedagogical decisions will be impacted by the skills they need to use technology effectively and productively in the classroom (Dong & Newman, 2018). However, some teachers lack technical experience, which does not have a favourable impact on their pedagogical decisions. For teachers to fully decide whether they want to utilise the various possibilities opened up by technology, technical expertise alone is not sufficient. Beyond this, teachers need to have a technologically supportive environment to exploit their pedagogical decisions and a lack of support limits innovative ways of teaching (Dong & Newman, 2018).

Prestridge (2014) argues that, even though teachers are faced with many barriers to teaching using technology in their classroom and the school context, it is important that they overcome these barriers and be the agents of change, especially in a rapidly changing world. Prestridge (2014) urges teachers to learn innovative methods of teaching, including through technology, to support learner learning, and to provide better interaction, active teaching and learning, and well-planned pedagogic outcomes. Similarly, Dong and Newman (2018) note that, when teachers recognise the impact of technology on their pedagogical decisions and take the initiative to prepare lessons that utilise technology, learners and teachers are better engaged, learners learn to be critical thinkers, and teachers become more inventive planners. A study conducted by Hadiyanto et al. (2017) identified that the culture and condition of the school's facilities will play the most important role in the potential impact of technology on teachers' pedagogical decisions. If schools are better equipped and teachers have the necessary skills and training to integrate technology, the teachers will have the pedagogical options and opportunities available to shape their pedagogical decisions. However, if those schools have limited to no access, teachers will be unable to work effectively and efficiently with these devices. This will impede teachers' pedagogical decisions. While the schools cited in the Hadiyanto et al. (2017) study were equipped with the necessary devices, and where there was an emphasis of technology use in the classroom, there were teachers within the district who felt that too much emphasis was placed on technological devices specifically, rather than pedagogical practices as a whole.

For teachers to make sound pedagogical decisions, they should be equipped with technical and pedagogical experiences that are useful in their future teaching. Without technical and pedagogical experiences, teachers will base their pedagogical decisions only on what they know and, in terms of technology use, their understandings and attitudes will determine their technology use (Drossel et al., 2017, Ozer, 2018). Studies by Scherer et al. (2018) have captured various attitudes towards technology and the pedagogical decisions of teachers, which revealed that attitudes towards technology place heavy emphasis on behavioral intentions for future classroom practice by teachers. Teachers' use of technology encompasses not only technical knowledge and skills, but the knowledge of technology and successful technology integration into classroom instruction depend on the teachers' attitudes (Scherer et al., 2018). Attitudes toward technology indicate a person's evaluation of the expected performance of a certain behaviour such as the use of technology for learning and teaching. If teachers perceive that technological tools do not meet their own or their learners' needs, such perceptions shape

their pedagogical decisions, and they are not likely to try and incorporate the tools into their teaching (Buabeng- Andoh, 2012). Thus, teachers' attitudes towards technology play a crucial role in technology integration and on the pedagogical decisions they make in their classrooms (Goldstein & Tessler, 2017).

## **2.7. Technology Use in the English Classroom**

Cahyani and Cahyono (2012) found that some teachers displayed an optimistic attitude to the use of technology in the English classroom because it eased the process of teaching by saving energy, allowed for greater interaction between learners, the teacher was not dominating the lesson, and the learning process was easier to comprehend when topics were introduced to the learners. Shyamlee and Phil (2012) note that technology is an essential part of teaching and therefore it is highly important for language teachers, including English teachers, to be aware of the latest and best equipment as the use of multimedia technology lends colour and variety when teaching English. In the English classroom, technology use has to be considered to keep apace of the global technological revolution by adopting modern technological means such as computerisation, multi-media devices, mobile phones, audio/visual effects applications, and social media that will optimise language instruction in a systematic and advanced way (Mofareh, 2019).

Kusumarasdyati and Luo (2004) and Prestridge (2012) note that teachers need to provide quality teaching materials that will be engaging, interesting, and up-to-date to ensure learners learn English, which has become increasingly challenging to teach to enable increased English proficiency. These challenges are the same across the globe and for all subjects and include inappropriate support for training, lack of teacher knowledge and training, inadequate network connectivity, high costs of devices, a lack of policy on funding for schools' use of technology, and lack of continuous reinforcement.

### **2.7.1 Effective Use of Technology in the English Classroom**

With the rapid development of science and technology, and the emergence and development of multimedia technology and its application to teaching, featuring audio and visual effects, the English classroom is a favourable platform for reform and exploration (Graddol, 1997). Technology is an effective tool for English teachers to enhance their learners' cooperation, has

allowed teachers to adapt to learner-centred teaching and learning, and has enabled them to move away from traditional teacher-centred classrooms, a move which helps with guiding learners' learning through cooperative language tasks, collecting information, and interacting with material sources actively (Costley, 2014; Gillespie, 2006; Graddol, 1997; Rahimi & Bigdeli, 2014; Hashim, 2006). Moreover, researchers such as Mouza (2008) and Sabzian et al. (2013) agree that technology use has proven to boost learners' confidence via the cooperation among them and between them and their teachers, as they also assist their teachers in their technical teaching processes. Technology use also enables the use of authentic material resources and can create opportunities for learners to practice social interaction to boost their language and life skills cognitively and meaningfully, which may lead to greater English skills improvement for learners generally (Alsulami, 2016).

In the English classroom, films are becoming an important part of the curriculum for English literature, because they provide exposure to real language use in authentic settings and in the cultural context in which the language is spoken (Kusumarasdyati & Luo, 2004). Herron et al. (1995) found that movies and videos provide interesting and motivating ways to stimulate active learning for learners. Teachers also believe that technology can make language learning easier through visual aids and videos as they enhance language learning and comprehension skills, making the lesson more enjoyable (Ertmer, 1999). Olelewe and Amaka (2011) found that skilled English teachers used various teaching and learning technologies such as videos, the computer, the internet, and multimedia equipment to enhance the teaching and learning process through the presentation of new ideas and innovations that assisted both the teachers and learners interacting with the knowledge that is required. For example, instead of repeatedly using the same device of a power-point presentation of a poem being analysed and discussed, teachers can use audio clips and video clips so that learners may listen to and watch the clips related to the main themes and this can keep learners engaged but also provide teachers with various ways of making their lessons interactive and innovative. The usage of multimedia texts in the classroom assists learners in becoming familiar with vocabulary and language structures. The application of multimedia also makes use of print texts, film, and the internet to enhance learners' linguistic knowledge. The use of print, film, and the internet gives learners the chance to collect information and offers them different materials for the analysis and interpretation of both language and contexts (Arifah, 2014).

Yadav's (2009) study into technology use to enhance English language learning at a secondary school found that technology use allowed for increased learner autonomy and control,

providing a more learner-centered pedagogy with learners who were more actively engaged in their learning than in traditional direct instruction methods. In a study by Prestridge's (2012), the use of technology facilitated the teaching and learning process by providing comprehensible input as a scaffold to support learners as they studied academically challenging subject matter, along with providing learners with language experiences as they moved through various stages of language acquisition.

Similarly, findings by Sad et al. (2020), in their Indonesian study with teachers from various public schools, indicated that the use of technology in the English classroom improved English language acquisition and improved learners' mastery of vocabulary and reading speed. In addition, there was an increased capacity to employ English articles in the context of the lesson as well as enhance the speaking and listening skills. The teachers in the study indicated, through their interviews, that they embraced technology in their English classrooms and recognised the positive changes in their pedagogies. Like the findings from Sad et al. (2020), Kao (2020) found that technology allowed for an improvement in learners' vocabulary mastery and reading, an enhancement of speaking and listening skills, and better comprehension skills. Teachers noted that technology allowed for better-prepared, interesting and engaging English lessons that did not rely only on textbooks and worksheets.

Razak et al. (2018) rightly notes that the introduction of technology in English language classrooms in schools has been recognised as a necessary course of action for the improvement of teaching methods. Razak et al. (2018), have suggested that a crucial factor for successful technology integration into the English classroom is the teacher. When teachers revolutionise their classrooms with mobiles, computers, and internet-connected devices, ordinary and low-level learners make massive language learning gains, pointing to the importance of buy-in from teachers. Furthermore, as Doucet et al. (2018) note, teachers are no longer teaching English and other languages in isolation as they now co-teach, team teach, and collaborate with other department members. As lifelong learners, they are active participants in their language learning. It thus becomes important that they seek out professional development that helps them to improve both learner learning and their performance (Xing & Marwala, 2017).

Dawson, Cavanaugh and Ritzhaupt (2008) and Pourhosein Gilakjani (2014) maintained that using technology can create a learning atmosphere centered around the learner, rather than the teacher that in turn creates positive changes. They emphasised that by using technology, language classes become active places full of meaningful tasks where the learners are

responsible for their learning. Drayton et al. (2010) argued that using technology indicates a true learning experience that enhances learners' responsibilities.

However, some English teachers are hesitant to use technology in their English classrooms even though they are aware of the benefits it brings. Kolbakova (2014) found that, with technology, learners tend to use short abbreviated forms in their writing, like they do on social media. In their study, Doucet et al. (2018) noted that teachers found difficulties managing planning activities involving the use of technology in the teaching of English writing. Another writing-related challenge was that learners tended to copy and paste from the internet sources, thus using plagiarising activities, and the ease of obtaining quick and massive information chunks from the internet caused learners to be apathetic in preparing their tasks (Mustafa, 2016).

A study by Oju and Adu (2018) found that teachers in the Eastern Cape, South Africa benefitted from inadequate training support and poor technological knowledge, specifically regarding how to use technology in the English classroom, inadequate network connectivity, and high costs involved in device acquisition, among other challenges (Oju & Adu, 2018). As Prestridge (2012) noted, some English teachers are unable to utilise technology, due to a lack of exposure and training, and are unsure how to use technological devices for their English lessons. In a more recent study by Ahmadi (2018), the findings suggested that educational institutions ought to have training programmes to support teachers on how they may expose learners to materials on computers to support and reinforce materials in learners' textbooks and workbooks, and thus improve the language learning process.

## **2.8. The DBE Action Plan to 2014: Towards the Realization of Schooling 2025**

The Department of Basic Education (DBE) Action Plan to 2014: Towards the Realisation of Schooling 2025 was a strategic framework developed by South Africa's DBE to guide the improvement of basic education in the country. The plan laid out a vision for achieving significant advancements in the quality of schooling by 2025. One of the key goals of the Action Plan was to promote the use of Information and Communications Technology (ICT) in schools to improve educational quality and access. The DBE aimed to equip schools with computers and other ICT tools to support teaching and learning processes. This included the provision of computer laboratories, smartboards and other digital learning resources (Department of Basic Education, 2014).

The Action Plan also recognised the importance of providing equal access to digital resources for all learners, particularly in under-resourced and rural areas. The DBE also developed an e-Education strategy aimed at ensuring that every learner is technologically literate by the time they complete grade 9. The strategy focused on providing schools with digital content, online learning platforms and internet connectivity (Department of Basic Education, 2014).

However, the Department of Basic Education (2018) argues that despite the ambitious goals, the implementation of ICT in education still faces significant challenges, which includes the unequal access to technology, lack of infrastructure in rural areas and the varying levels of teacher ICT proficiency. These are ongoing challenges which the DBE continues to address thorough initiatives such as the ICT4RED (Information and Communication Technology for Rural Education Development), implemented in South Africa to improve the quality of education in rural schools by implementing technological devices into the teaching and learning processes. This initiative focused on empowering teachers with the necessary skills to use technological devices effectively in their classrooms, mainly in under-resourced areas (Nkula & Krauss, 2014). Another major challenge noted by the Department of Basic Education (2016) is that there is an inadequate form of training for teachers in the use of technological devices as many teachers are not familiar with digital tools and lacked the skills to effectively integrate technology into their teaching practices. It was also noted by Nkula and Krauss (2014) that some teachers are resistant to adopting new technologies due to their lack of confidence or the fear of not knowing how to use these devices which slowed down the pace of technology adoption in schools. The main challenge faced as stated by the Department of Basic Education (2016) is the financial constraints as continuous funding is required not only for the initial deployment of technology but also for its upkeep, software updates, and the training of new teachers and therefore, budget limitations made it difficult to sustain these efforts overtime.

The DBE's Action Plan for Technology integration is ambitious and aims to transforming education in South Africa. However, with the challenged presented ranging from infrastructure deficits and insufficient teacher training to inconsistent implementation, posed significant obstacles to realising the full potential of technology education. Addressing these challenges requires continued investment, capacity building and a coordinated effort across all levels of the education system.

## **2.9. Potential Impact of DBE Teacher training and professional development on technology integration in English Classrooms**

The Department of Basic Education (DBE) in South Africa has prioritised teacher training and professional development as crucial components of its education and reform initiatives which includes technology integration in English classrooms and according to Ramen and Don (2013), the potential impact of these efforts can be significant which can have an influence in various aspects of teaching and learning. Firstly, the DBE-led training programmes focuses on technology and equipping teachers with the necessary skills to use digital tools effectively in the classroom which includes digital literacy tools, and online resources that can enhance language learning (Department of Basic Education, 2011). Secondly, it has been noted by the Department of Basic Education (2020), that by having these professional development programmes, it can help boost teachers' confidence in using technology, making them experiment with and integrate digital technology into their teaching practices. Thirdly, it can provide innovative teaching methods which can enable teachers to use blended learning approaches which allows for them to combine traditional teaching methods with technological devices making lessons more interactive and engaging (Department of Basic Education, 2020). Interactive teaching and learning can also be beneficial to learners which helps them to engage with the material. It can also help these teachers who are trained to help meet the diverse needs of learners and those who are struggling. The Department of Basic Education (2020), states that teachers who are trained in technology can use their devices and tools to provide additional support to struggling students by using reading apps to improve vocabulary and comprehension or software and finally, these training initiatives can establish professional learning communities (PLCs) where teachers continually support each other in integrating technology, leading to sustained improvement in teaching practices (Department of Basic Education, 2011).

Although teacher training can improve technology integration, there are challenges in access to technology, as schools may not have access to such devices limiting the effectiveness of these efforts by the DBEM and therefore, it must be addressed how resource-constrained schools can integrate technology. Another challenge noted by Hennessey et al. (2010), is that once-off training sessions may not be sufficient and continuous professional development is essential to keep teachers updated on the latest technological tools and pedagogical strategies for their effective use in English classrooms and with proper training teachers are able to integrate technology in a way that enhances the English curriculum, making it more relevant and aligned with 21<sup>st</sup> century skills.

The DBE's focus on teacher training and professional development in technology has the potential to significantly enhance English language teaching in South Africa (Department of Basic Education, 2020) and by improving teachers' technological skills, fostering innovative teaching methods and enhancing learner engagement, these initiatives set out by the DBE, can lead to better learning outcomes and prepare learners for a digital world and therefore it is crucial that training programmes are continuous, inclusive and responsive to the needs of both teachers and learners.

## **2.10. Conclusion**

The literature review chapter reviewed both past and present literature on technology, technology integration in education comprising of both the advantages and challenges faced by teachers, their attitudes and experiences, as well as how these understandings, experiences and attitudes shape their pedagogical decisions, demonstrating a richness of data regarding literature on technology in the classroom. However, there is a need for more research on teachers' understandings and experiences of technology in the English classroom in a South African school context. Such research is the focus of the present study.

The next chapter will present the theoretical framework that underpins this study.

## **CHAPTER THREE**

### **THEORETICAL FRAMEWORK**

#### **3.1. Introduction**

The previous chapter discussed current findings on teachers' understandings and experiences of technology use in the English classroom. Moreover, it considered different perceptions on technology use in the English classroom, which included technology and its origin, technology in education, the attitudes and experiences that shape teachers' pedagogical decisions, as well as the utilisation of technology when teaching English. This chapter discusses and presents the various processes and concepts that are related to the theoretical framework of this study.

The theoretical framework that underpins this study comprises the theory of experience by Dewey (1938), and the Technology Acceptance Model by Bagozzi and Warshaw (1989).

The Technology Acceptance Model (TAM) (Davis, 1986) is a model that predicts the likelihood of a new technology being adopted by a group of individuals in their context, along with the variety of technologies that are available. There are three main constructs which are used to explain the users' motivation to use technology which are perceived ease of use (PEoU), perceived usefulness (PU), and the attitude towards use (ATU), or attitude towards adopting technology to explain the attitude of usage and behavioural intention to use. These three constructs were useful in understanding how teachers perceived technology (their attitudes based on experiences) and whether their perceived ease of use were recognised as useful, which resulted in continued usage of technology in their classrooms.

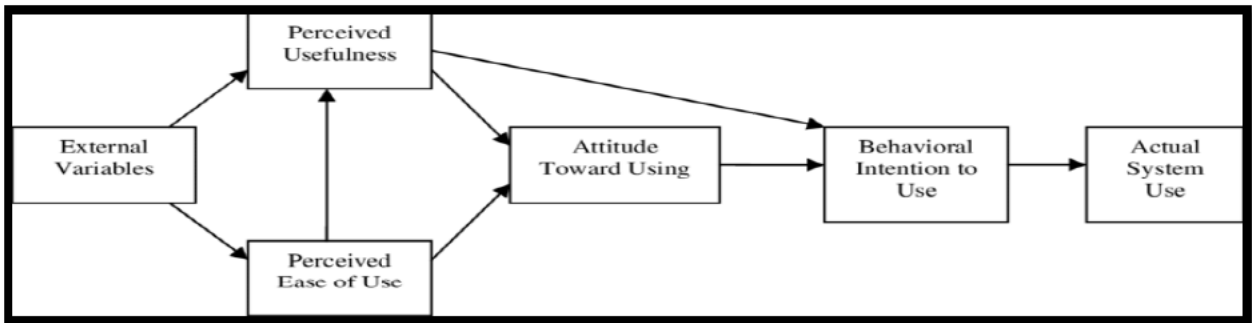
Dewey's pragmatic theory of experience (Dewey, 1938) represents the theorist's effort to explicate the process through which human beings learn and grow. Dewey's (1938) theory is a vehicle for growth which is a metaphor for learning that is tied to experience and in order for an experience to result in growth, it must meet the dual criteria of continuity and interaction (Stark, 2020). Teachers often claim that they learn more from teaching experience than from coursework (Wright, McCarthy & Meekison, 2004). Consistent with Dewey's theory of experience, the participants of this study were asked to discuss their teaching experiences of using technology in the classroom and how their attitudes explained their use of technology in the English classrooms. Dewey's theory of experience proved useful in this study in revealing

the possible reasons for the teaching experiences of each participant regarding technology use in their English classrooms.

### **3.2. TECHNOLOGY ACCEPTANCE MODEL**

Fred Davis (1986) first conceptualised the technology acceptance model (TAM) to examine the acceptance of information technology. It was created based on the theory of reasoned action (TRA), which explains a person's reactions and perceptions in taking action (Ajzen & Fishbein, 1975). This theory emphasises that individuals' beliefs and attitudes predict their intention to perform a behaviour. Beliefs in this case, according to Ajzen and Fishbein (1980), are defined as the individual's prediction that performing a given behaviour will produce a given consequence. However, associated to the TRA, the TAM provides more specific predictions because it applies entirely to technology usage behaviour and not behaviour in general (Davis, Bagozzi & Warshaw, 1989). Venkatash and Davis (2000) noted that TAM theorises that an individual's behavioural intention to use a system is determined by two beliefs, which are perceived usefulness, defined as the extent to which a person believes that using the system will enhance his or her job performance; and the perceived ease of use, defined as the extent to which a person believes that using the system will be free of effort. Venkatash and Davis (2000) describe TAM as a pathway according to which personal beliefs shape attitudes about technological devices usage, which results in the usage of technology. This model assumes that when users perceive a type of technology to be useful and also easy to use, then there will be continued usage and if the users are able to understand and see the significant changes that technology brings about in their daily lives with the ease it brings in their tasks, then the probability of use and acceptance will be much greater.

Essential to this study, in the technology acceptance model (TAM) (Figure 1), three primary factors will be used, and explained in detail, which are perceived usefulness (PU), perceived ease of use (PEU), and attitude towards use (ATU) to explain teachers' attitudes when using technology in their classroom.



**Figure 1. Diagram illustrating the Technology Acceptance Model (TAM) by Fred Davis, Richard Bagozzi and Paul Warshaw (1989)**

In the diagram above illustrating the TAM, the important constructs, which are perceived usefulness (PU) and perceived ease of use (PEoU), explain attitudes towards using technology which then predicts and explains behavioural intention to use. The behavioural intention to use technology should predict acceptance to use technology (Davis, 1989). Many experiments were conducted to validate PU and PEoU as independent variables by Davis (1989) and his findings showed that PU was considerably associated with both self-reported current usage and self-predicted future usage; whereas PEoU was always correlated with current usage and future usage. Davis (1989) also found that PU had a greater connection with system usage than PEoU, and PU also impacts directly on behavioural intention (BI).

Davis' hypothesis was firstly, the higher the PEoU, the greater the PU, which resulted in system use. Secondly, the higher the PU, the higher is a favourable and positive attitude towards the system use. Thirdly, the higher the PEoU, the more positive the attitude towards the actual system use. Fourth, the higher the PU, the greater the behavioural intention leading to system use. Lastly, the greater the degree of a favourable attitude which is positive to the concept of technology acceptance, then the higher will the behavioural intention be towards the system use.

The TAM was also further developed to understand the determinants of PEoU and PU and it was found that computer self-efficacy of a user affects PEoU both before and after exposure to the technological system (Venktash & Davis, 2000). The expanded TAM2 model contains social influence processing variables (subjective norms, image, as well as voluntariness) and cognitive instrumental processing variables (perceived ease of use, result demonstrability,

output quality, job relevance). This model (TAM2) showed a more detailed relationship of various factors that influenced technology acceptance within a context.

The foremost later modification resulted in TAM3. The main aspects of the TAM3 address the key factors of perceived usefulness in addition to perceived ease of use (Venkash & Bala, 2008) and as a result, the TAM3 was born from the integration of the TAM2 (Venkash & Davis, 2000) with the paradigm of perceived ease of use determinants. These researchers assumed that perceived image and perceived ease of use result demonstrability, along with subjective norms. Output quality, experience, and voluntariness are categorised as moderators.

Considering other aspects of the model, Venkash and Bala (2008) assumed that perceived ease of use is impacted by what they call anchors and adjustments. These constructs were called 'anchors' for the reason that when the facts about the system's ease of use are deficient, persons tend to depend on general information (anchor) to perceive the system's ease of use. Venkatesh (2000) theorised that the anchors, associated with computers and their use, drive people's preliminary opinion about the system's ease of use and believes that it would be more significant when more experience has been achieved. Adjustments, on the other hand, are based on the increasing experience with the system, where individuals are expected to adjust their system-specific perceived ease of use to reflect their interaction with the system.

Although the TAM model has been updated now to the TAM2 and TAM3, the original model is most relevant to the present study as the three main constructs which relate to the research questions will be answered using the original TAM model.

### **3.2.1. Explaining the Three Constructs**

#### **3.2.1.1. Perceived Usefulness (PU)**

According to Davis, Bagozzi and Warshaw (1989), perceived usefulness (PU) is defined as a measure by which the use of technology is believed to provide benefits to the person who is using it; and the perception of usefulness as the subjective ability of future users, where using a specific type of technological system device will improve their performance in the organisational context. These researchers also highlight that PU will indirectly influence the behavioural intention (BI) to use technology. Usefulness is a perception where one believes that the use of a particular technology will provide benefits or even provide a positive impact that will be obtained when using the technology in a particular setting. Davis et al. (1989) note

that users may not prefer to use technology, but may still continue to use it because of their positive perceptions regarding its impact on job performance. Davis et al. (1989) identify two forms of motivation namely, extrinsic and intrinsic motivation. Extrinsic motivation is perceived to be helpful in achieving special outcomes that are different from the activity itself; in contrast, intrinsic motivation refers to the performance of the task for no apparent reinforcement. Therefore, PU is relevant to the acceptance of technology, because it is adopted first and foremost due to it being instrumental in achieving specific objectives. Within the classroom context, the teacher will accept technology as useful if it achieves objectives.

Technology will be perceived as useful if it may be measured through performance, improvement, increased effectiveness and increased productivity (Harryanto et al., 2018). The process of usage will highly depend on the past experience and the individual gains associated with it and indicates that, if the user is experienced, then the user has no concerns about the ease of use, but rather focus more on the benefits. Garcia et al. (2020) support this definition by mentioning that PU relates to a user's experiences and how technology has contributed to, as well as improved their work performance. PU describes what the particular technological devices enables the users to do, and to what degree these devices leads to these users improving their performance levels. PU explains the extent to which technology allows users to have control over their interactions, as well as ascertain whether users are able to remember how to use technology within their context (Garcia et al., 2020). Thus, as Onita et al. (2021) state, PU is an individual response, where, when a new form of technology is being used, provides convenience in every part of the job; it can then be concluded that PU will add a great benefit to the achievement of the job. This also shows that the productivity of the user will increase (Michaela & Edwin, 2021).

Wong et al. (2010) established in their study that PU has a significant influence on the attitude towards computer and technology use and behavioural intention. The study also describes and agrees with previous researchers cited that PU has direct and indirect effect upon behavioural intention. Wong et al. (2010) note that teachers will tend to use technology in their classrooms if they perceive technology to be useful and meaningful to enhance and deliver lessons. Bradley (2012) cites Ong and Lai (2006), who found that a high level of perceived usefulness (PU) often results in a positive user-performance relationship. In the case of technological devices used in classrooms, if teachers perceive that an advanced method of a learning system can help improve their work performance, they are more likely to utilise technological devices and this creates a positive influence on the users' performance. Bradley (2012) found that perceived

usefulness has a positive effect not only on teachers, but also on learners' intention to utilise these devices, resulting in both being a useful and meaningful way to learn and teach more effectively, with a view to attaining higher performance. Bradley goes on to add that one of the reasons why PU exerts a strong influence is that teachers tend to become more educated on their lesson delivery as well as understanding how these devices enhance and modify lessons which help them become more productive teachers. Ratna and Mehra (2015) support this view, and note that in the context of learning through technology, a significant effect is shown on perceived usefulness, which influences the behavioural intention directly. In the present study, PU is used to explain the way in which teachers experience technology usage in their English classrooms, and the possibility of continued usage based on the contribution it makes to their lessons.

#### **3.2.1.2. Perceived Ease of Use (PEoU)**

The second construct which is perceived ease of use (PEoU) is an individual's belief that using a particular system/technology for a specific purpose reduces the effort that is required (Davis, 1989). Another definition provided by Davis (1991) is the degree to which an individual believes that using a particular system would be free from any physical and mental effort. Pinho and Soares (2011) described PEoU as the degree to which users experience the technology as easy to use, a device or devices that do not demand any extra effort or skills and also allows for the flexibility of use. PEoU also highlights the way in which users feel the ease to become skilful in technology use. Likewise, Venkatesh (2000) notes that PEoU describes an individual's perception of how easy the innovation is to learn and to use. For example, if a user's job content is devoted to physically using a system, and if the user becomes more productive and efficient using the system, it will lead to greater ease of use, and the user will become more productive and motivated. However, it may not always have a positive outcome if the technology is too difficult for the user. This construct shows how and whether a system of use makes users complete their work faster, increase productivity, and work efficiently (Davis, 1989).

For teachers in particular, they must be innovative when adapting to technology as well as overcoming the mental and physical challenges posed by technology. Hence, if users find technology to be easy and understandable, they will be able to accomplish much more work

but if they perceive technology to be monotonous or even difficult to navigate around the lessons, then it will result in the user not being enthusiastic to utilise technology.

Venkatesh et al. (2003) highlight the strong role that PEOU plays in predicting the behavioural intention (BI) to use. They also suggest that the user's belief over time changes along with their experiences and how accessible and easy the technology use becomes. Similarly, Davis et al. (1989) alert researchers to look for external variables that may affect the beliefs and usefulness and ease of use for the user. Lee et al. (2008) found that PEOU has a direct and positive effect on PU and the attitude of teachers towards using technological devices.

In education, user-friendly and easy to use technological devices are very important for teachers as they create user-friendly teaching and learning environment (Waheed & Jam, 2010). Waheed and Jam (2010) add that less effort required in understanding will lead to the easy adoption of methods, increase the level of satisfaction, and hence, lead to an extensive level of efficient teaching and learning. PEOU thus leads to greater efficiency.

Abdullah and Ward (2016) found in their research study that there are numerous factors that affect the users' acceptance of technology such as the anxiety when using these devices, which can entail the set-up and preparation, enjoyment, and overall experience. Yet, the most pivotal predictor is the self-efficacy associated with PEOU which is based entirely on one's recognition and ability to act and manage their actions. Self-efficacy (SE) as defined by Bandura (1997) refers to the individual's perceptions based on his or her ability to use technology in the accomplishment of a given task, rather than reflecting on simple component skills. This corroborates Davis (1989), who observes self-efficacy to be correlated well with both PU and PEOU.

In the context of this study, self-efficacy can be seen as a way in which teachers' self-confidence enhances their ability to perform certain teaching and learning tasks through the use of technology. It is expected that the higher the self-efficacy, the more likely the user will be willing to adopt and perceive the use to be of ease as compared to a teacher with a low self-efficacy, which would be the opposite. Hence, the model recognises both PU and PEOU being influenced by the type of technology used and how this will eventually shape the teachers' attitude towards their use (Garcia et al., 2020). In support of this, Pinho and Soares (2011) state that if their use is easy and they are able to navigate through the challenges of its use and it provides the benefit and enjoyment, then there will be continued usage and the attitude will be favourable. However, if these users perceive the use to be difficult and unfavourable, then they

will most probably find it to be less or not useful at all. Researchers Tokel and Isler (2013) found in their study that the perceived enjoyment when using technology had a direct and positive effect on PU and PEOU which leads to technology acceptance.

In this study, PEOU assists in assessing teachers' beliefs and attitudes regarding how easy and free of effort it is for them to utilise technology. Therefore, it can be understood that PU and PEOU are two fundamental constructs that are predictive of attitude information and actual use of technology.

### **3.2.1.3. Attitude Towards Use (ATU)**

The third construct that is applicable to the study is attitude towards use (ATU), which is a central aspect to the model which will ultimately decide the users' utilisation of technology. ATU is defined as the positive or negative feeling of individuals in performing and how this feeling can affect the particular behaviour of use (Teo, 2009; Kiraz & Ozdemir, 2006). The intention of this construct in the TAM is to directly influence the frequency of the use of technology to create an attitude that is either favourable or unfavourable. Zaineldeen et al. (2020) recognise ATU as the extent to which users' experiences with technology are either positive or negative and will have an impact on the actual use. This construct also explains whether the users like or enjoy the technology when used as well as if they are able to impress others in their use of the system devices. Davis (1989) notes that attitude is at best a fractional intermediary of the effect of perceived usefulness, perceived ease of use and intention to use, and also added causal explanatory power to an individual's intention to use a particular system of technology. He also added that individuals who had a belief in the use of a new type of technology, would lead to a more positive outcome, thus a more positive attitude towards it.

Attitude, as defined by researchers Azjen and Fishbein (1997), refers to the affective evaluation towards a given task which is the degree to which a user likes and dislikes the use or idea of technology. Attitude is an individual's positive or negative feeling that is associated with performing a specific behaviour and that an individual would hold a positive attitude, if the user believes that the performance outcomes will be positive (Azjen & Fishbein, 1997). On the other hand, if the individual believes or experiences a negative outcome, then the user will hold a negative attitude towards technology use (Mykytn & Harrison, 2003). Tira et al. (2016) and Islami et al. (2021) note that a person's attitude towards a technology can be used as a measure of acceptance of technology because their attitude will show positive or negative feelings towards acceptance and usage.

Hussein (2017) notes that the attitude of use will mainly be determined by the knowledge that the user has when implementing the device and how best this relates to the content of the topic to be taught. Hanifa (2020) also adds that the characteristics depicted by the users in terms of their attitude towards technology will play a significant role in their usage, which will either be continued usage with satisfaction, due to the many benefits it carries forward or a discontinued usage, due to inconvenience or dissatisfaction. Sumak et al. (2011) also caution researchers that factors are largely dependent on the user itself and the technology being used. Through various methods of data generation, the current study considers the experiences and attitudes of the teachers represented in this study regarding technology usage in the English classroom and the TAM is used to explain the reasons for the teachers' attitudes, acceptance as well as usage. The study also demonstrates the relationship between perceived ease of use (PEoU), perceived usefulness (PU) and attitude towards use (ATU).

### **3.2.2. The Broader Use of TAM**

Various studies across the world have used the technology acceptance model (TAM) to explain their findings. The studies cited were all quantitative studies, which is common among studies using the TAM. The present study is a qualitative study, bringing a different dimension to studies using TAM.

A quantitative study by Hong, Zhang and Liu (2021) in China aimed to find ways to improve 1568 preschool teachers' technology acceptance and their intention to use technology during COVID-19. The study examined preschools teachers' technology acceptance with the TAM and their determinant factors. It found that these preschool teachers' perceived usefulness (PU) showed a weak direct impact on their intention to use, but their perceived ease of use (PEoU) was strong when it came to computer efficacy only.

In a study by Weng, Yang, Ho and Su (2018) in Taiwan, the researchers explored the effects of information technology (IT) among 460 elementary school teachers to determine whether they intended to use the multimedia material. The focus was on their attitudes towards use (ATU) of multimedia among school teachers. The study showed that the perceived ease of use (PEoU) of the multimedia material enhanced the intention to use, and how the teachers' attitude towards use (ATU) also influenced their intention to use.

A quantitative study by Abdullah, Ward and Ahmed (2016) considered 242 undergraduate learners in the United Kingdom to collect data to investigate learners' perceived ease of use (PEOU) and perceived usefulness (PU) of e-portfolios. The e-portfolios were used to facilitate learners' learning and personal growth. The findings helped the researchers to improve their understanding regarding learners' acceptance of e-portfolio systems. The findings showed that perceived ease of use (PEoU) is the best predictor for learners when it comes to e-portfolios, but perceived usefulness (PU) and behavioural intention (BI) should also be considered as important factors when designing and implementing e-portfolios.

Researchers Wong, Osman, Goh and Rahmat (2013) considered 302 Malaysian learner teachers to determine their integration of technology in teaching and learning. The findings indicate that perceived usefulness (PU) and attitude towards computer use (ATU) were most significant and had a positive effect on learner teachers' behavioural intention (BI) to use computers in teaching and learning.

Waheed and Jam (2010), in a quantitative study based their study on lecturers at the Allama Iqbal Open University, measuring intention to accept online education. The TAM could successfully determine lecturers' usage of technology and their welcoming of technology use.

### **3.2.3. Types of technologies teachers are using in relation to PU, PEoU & ATU**

In the context of teaching English, particularly when examining how teachers adopt and integrate technology, it is essential to consider these three factors, Perceived Usefulness (PU), Perceived Ease of Use (PEoU), and Attitude Towards Use (ATU) which are derived from the Technology Acceptance Model (TAM).

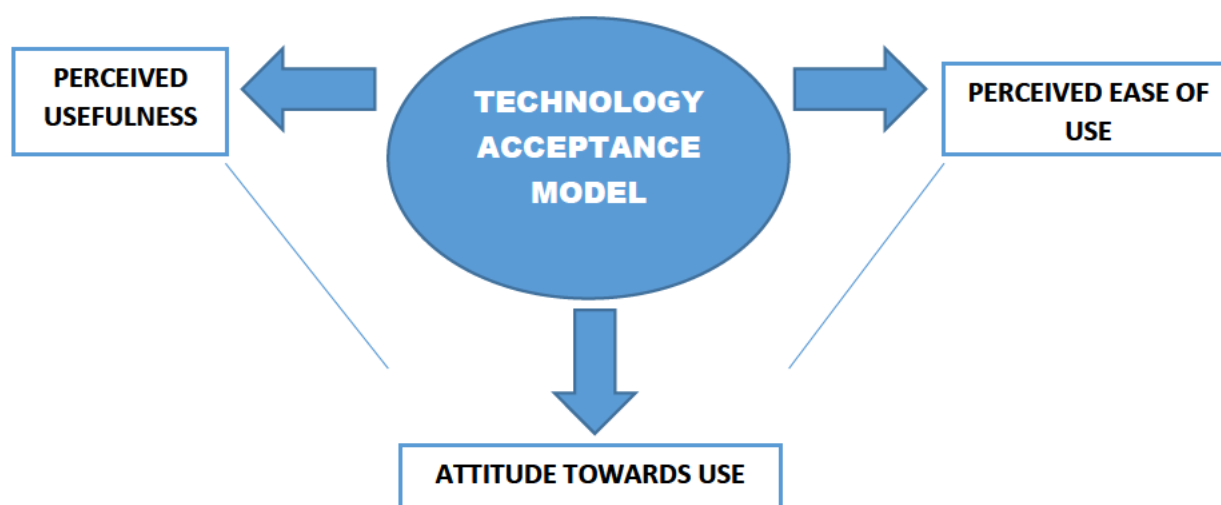
Digital technology such as laptops for power-point presentations, tablets for researching, OHP'S and screens to name a few used, are perceived to be more useful than traditional methods of teaching. Teachers tend to adopt these devices because they believe it will significantly enhance their learners' learning experiences in the classroom beyond what traditional methods can offer (Waheed & Jam, 2010). Teachers found that when a technological device is straightforward and integrates seamlessly into existing teaching practices, teachers are more likely to use it. Although traditional methods such as using textbooks, worksheets and the chalkboard are often easier to use because they are familiar, but learners are slowly becoming very technologically advanced and knowledgeable and teachers need to keep up with the modern ways of teaching and learning by using technological devices in their classrooms to grab the attention of their learners and keep them engaged in their lessons, therefore their

perceived ease of use increases (Weng, Yang, Ho and Su, 2018). Teachers' attitudes towards technology are influenced by their comfort level with new technological tools and their belief in the technological devices effectiveness. While many teachers in the study believed that using technology kept learners fully engaged in the lesson, whilst others found it time consuming to move to the designated rooms and set up the devices and preferred traditional methods for its simplicity and reliability whereas other teachers' attitudes were more open to experimenting with new technologies because of their belief of leading to better learning outcomes (Weng, Yang, Ho and Su, 2018).

In the study, there are teachers who still use their traditional ways of teaching, however the latter are adopting technologies such as OHPs, laptops, screens, tablets and online learning platforms. These technologies are chosen because they are perceived as more useful in enhancing teacher and learner engagement in the classroom and some teachers found it easier to use which positively influenced teachers' attitudes towards integrating technology into their English classrooms.

The teachers in this study used traditional methods when it came to teaching, such as the use of textbooks, worksheets, the chalkboard and direct instruction by the teacher as well as digital technology such as laptops, tablets, OHP's, screens etc. With the use of these digital technologies, the PU, would be beneficial to both teacher and learners. In terms of the teacher, they are able to be more confident in the delivery of their lessons as well as knowledge of knowing how to operate with these digital devices will allow for them to continue using it. With learners, they will be knowledgeable about language acquisition, as they are able to comprehend, understand and practice language skills effectively and in a more engaging way.

The diagram below highlights the key constructs of the Technology Acceptance Model.



**Figure 2: Technology Acceptance Model (Davis, 1989)**

#### **3.2.4. Implications of the Technology Acceptance Model (TAM)**

The study examines the TAM within the context of high school teachers' attitudes and experiences when using technology in their English classrooms, and this model facilitates consideration of teachers' attitudes when using technology in their classrooms as a teaching method. From a theoretical perspective, this study reinforces the role that PEoU, PU and ATU play as determinants of either a positive or negative attitude towards technology use in the classroom. Research indicates that technologies constantly evolve in order to be user friendly (Pinho & Soares, 2011), and this research study empirically confirms that this constitutes an important determinant of use.

There should therefore be a coherent strategy to integrate technology into the teaching and learning environment where teachers can adapt to the changes that technology brings and where learners have the opportunity to witness technology harnessed in all aspects of the institution. For teachers to perceive technology as useful, they need to see evidence of becoming more productive and effective when they engage learners with these devices during lesson delivery. Teachers also need to understand that these devices used in the classroom can save a lot of time, and get more work done with less effort, as per the model.

However, from a practical perspective, it can be understood that in a school context the perceived ease of use may not be experienced by teachers who find technology challenging and therefore, technology usefulness may be associated as being negative. In addition, if there are low levels of usage of technology or the non-availability of some technological equipment, attitudes will be negative. When teachers feel supported by adequate and effective support structures to enhance their use and provide them with successful experiences with the technology, then they develop positive attitudes towards technology in their classrooms which will reinforce their intention to use technology over time (Pinho & Soares, 2011). If teachers are not fully trained in the use of technology this can result in their attitude being negative which is important to note (Gu et al., 2013). Beliefs and attitudes do not remain static overtime, and teachers and administrators need to remain responsive to the changes in the technological advancements and how such changes could be optimised to enhance teaching.

The attitudes of teachers towards using technology in the English classroom must be considered by schools so steps may be taken to ensure that a more positive attitude is created by examining classrooms for the proper type and amount of technology needed, not just in a few but in all classes, so that there are more opportunities to use technology in their lessons. The PEOU and PU may play a major role in the ATU. If teachers feel that the technology is difficult and their ease of use is challenging, then there is a need for a training programme to be held for teachers to be aware of the benefits technological devices provide to teachers in their classes so the attitude towards usage and implementation of technology is more welcoming, which can facilitate both teachers and learners during the learning process.

### **3.2.5. Limitations of the Technology Acceptance Model (TAM)**

As one would expect, there are limitations, shortcomings and challenges of the TAM, especially when trying to apply it to a specific context and subject area. A limitation noted by Scherer et al. (2019) is that the model it does not specify which types of professional knowledge about teaching with technology that teachers must have in order to integrate technology meaningfully. TAM does not account for the dynamic nature of technology use over time as the user's perceptions of usefulness and ease of use can change as they gain experience with the technology, but TAM does not address this evolution (Scherer et al., 2019).

### **3.2.6. Shortfall of TAM**

The Technology Acceptance Model (TAM) is widely used to understand how users come to accept and use technology. However, it does have some shortcomings which sparked alternative theories, which includes John Dewey's emphasis on the Theory of Experience which has been selected and used in this research.

It has been identified that TAM focuses on two key factors which are Perceived Usefulness (PU) and Perceived Ease of Use (PEoU), which can oversimplify the complex dynamics of technology adoption and does not account for other important factors such as social influences, emotional factors and contextual elements. TAM also tends to not consider how attitudes and acceptance may evolve over time (Pinho & Soares, 2011). Technology adoption can be dynamic processes influenced by ongoing experiences, which could change negative experiences of teachers into positive experiences through continued use of technology (Wong, Osman, Goh and Rahmat, 2013). These researchers further add that TAM does not emphasize the role of experience in shaping user acceptance and behaviour. Dewey argued that experience is central to learning and individuals learn best through active and engaged participation. Hence, a more engaged and interactive classroom with devices for learners to use and collaborate with other learners can result in fruitful teaching and learning.

Therefore, according to Pinho & Soares (2011), John Dewey's theory of experience provided a more holistic view of teaching and learning through experience. Dewey believed that teaching and learning occurs through participation and interaction rather than passive reception of information which aligns with the idea that teachers must engage deeply with technology to genuinely understand and accept it (Pinho & Soares, 2011). Teachers need to be given opportunities to be workshopped about technology in order to use it in their classes to create an actively engaged classroom atmosphere. Teachers need to also use reflective thinking in their teaching processes, it allows them to critically analyse their experiences which can enhance their understanding of the technological devices which can lead to a greater acceptance of technologies (Scherer et al., 2019). Dewey's model of experiential teaching and learning is a continuous process, rather than a once-off process. Hence, teachers' attitudes towards technology can change based on new experiences and reflections which is something TAM does not capture adequately.

Therefore, TAM provides a useful framework for understanding technology acceptance but its limitations in addressing the complexities of human experience, dynamics of teaching and

learning and contextual factors for both teachers and learners have led to theoretical developments of Dewey's model of experiential learning. Teachers need to embrace a more holistic view in order to better facilitate technology adoption and enhance their teaching and learning outcomes.

### **3.3. THEORY OF EXPERIENCE**

#### **3.3.1. Theorising experience**

The concept of experience is a commonly used and recognised concept in education, which refers to being involved in activities or events that profoundly mould one (Wolff-Michael & Alfredo, 2014). In other words, experience means participating in social and professional events that one encounters throughout one's lifetime. Dewey (2005) notes that experience is based on the interaction between humans and the world they live in and Hohr (2013) asserts that experience is based on the interaction between humans and in which they live. These researchers both agree that experience is the holistic existence of a human being, based on historical, communicative and cultural phenomena. Additionally, Dewey (2005) acknowledges that experience involves constant engagement in movements, histories, cultures and situations.

Dewey's concept of experience allows one to have skills and direction (Dewey, 1986). This experience is the "irreducible totality of people acting, sensing, thinking, feeling and meaning-making in a setting" (Wright, McCarthy & Meekison, 2004, p.44). Dewey (1925) further elaborated that experiences are an exciting part of human existence. Dewey (1925) noted that not all experiences are equal and makes a clear a temporal distinction between "experiencing" and "an experience", where experiencing referring to when something happens, while an experience is referring to the result from intentional action. Moreover, Mpungose (2018) advocates that experience is one of the most important aspects of the human community, as it helps with thinking through situations. He also adds that experience and/or professional (formal) actions will produce personal (non-formal) experiences that reflect one's identity.

#### **3.3.2. Dewey's Pragmatic Theory of Experience**

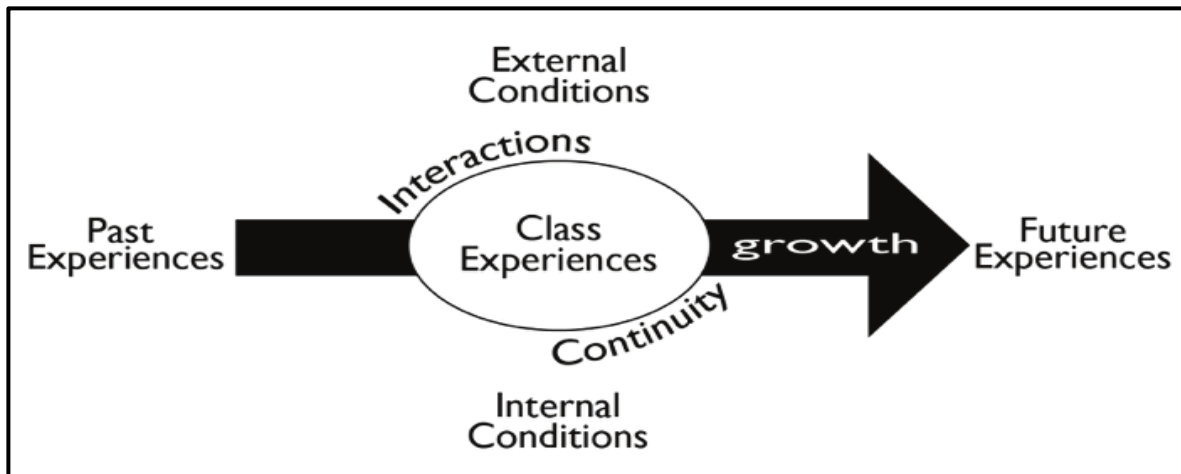
Teachers often claim that they learn more from teaching experience than from coursework (Vasile, 2016). Consistent with Dewey's theory of experience, the participants of the present study were asked to discuss their teaching experiences of using technology in the English classroom. Dewey's theory of experience proved useful in this study in revealing the possible

reasons for the teaching experiences of participants regarding technology use in their English classrooms.

Dewey's pragmatic theory of experience represents the philosopher's attempt to explain the process through which human beings learn and grow. Dewey (1925) noted that growth is tied to experience and experience is the vehicle for growth that enhances potential for further learning and development. Dewey (1925) contends that, in order for an experience to result in growth, it must meet the dual criteria of continuity and interaction. Experience resulting in growth will depend on the relationship between a current experience and past and future ones and an individual's interactions within the learning environment. Interaction refers to how past experiences interact with the present circumstances to make up current experiences (Dewey, 1938). Continuity refers to how previous experiences inform present experiences; and how present experiences will influence future experiences in a personal way (Dewey, 1938). Essentially, Dewey views the experience as an overlapping phenomenon that is embedded in situations, activities, and behaviours. Thus, Dewey's conception of experience suggests a continuation of interaction between people and their environment that makes up a person's integrated experience, forming their unique identity.

Moreover, Dewey's conception of experience is supported by that of Khoza (2018), Maxwell (2013) and Schon (2017), who indicate that for people to become aware of their identities, they must reflect on their strengths and weaknesses. Thus, people must reflect on (the past), in (the present), and/or for (the future) in order to understand their experiences and identities (Maxwell, 2013). For example, if teachers intend to understand their digital technology identities, they will need a space in which they will be able to reflect on their professional and social experiences. This suggests the importance of reflective activities being employed in any usage of technology. The essence of reflective activities in understanding digital users' experiences is evident in a study conducted by Khoza (2018). Khoza's (2018) study explored the use of Skype in conducting research. The study concluded that, when digital technology users reflect on their experiences, they become aware of their needs and thus use digital technologies to address their particular needs. These findings suggest that digital technology users generate sufficient power to capture and control digital technologies according to their categories of needs, driven by professional and/or social experiences.

The figure below illustrates John Dewey's (1925) Theory of Experience.



**Figure 3. Diagram illustrating the Theory of Experience by John Dewey (1925)**

The Figure above points to Dewey's (1925) recommendation that education be designed using the two main principles, which are continuity and interaction. With reference to the diagram above, according to the principle of continuity, Dewey (1925) posits that we learned something from every experience, both positive and negative, and that results in one's accumulated learned experience from past experiences that influence the nature of one's future experiences. The interactions, as shown above, build upon the principle of continuity and explain how past experiences show a clear interaction with the present situations to either create present experiences of either continued future experiences, or not. Interaction and continuity are discussed in greater detail below.

### **3.3.2.1. Interaction and Continuity**

Dewey's (1938) criteria for experience include interaction and continuity. Interaction according to Dewey (1925) is the transaction that takes place between an individual and what, at the time, constitutes his environment, from people to objects to ideas. It is therefore an interaction of the internal aspects of who we are, combined with external, objective factors. Hence, it is in this interaction that we engage in becoming human, which engages and extends our humanness. In the present study, the interaction with technology also serves as a way to interact with these devices within the context by testing them against traditional methods, understanding participants' experiences as they actively construct meaning, becoming agents of their own teaching methodologies, rather than passively absorbing the traditional norm of teaching. When this method works well for teachers, it then becomes a continuation and results in a favourable experience. When both interaction and continuity are present in experience, we

may refer to this as an educative experience. The job of the teacher is to create these series of experiences, not just for learners, but also to create an environment in which they are able to grow with experience (Dewey, 1997).

#### 3.3.2.1.1. The Criteria of Continuity

An educative experience, as argued by Dewey (1997), is temporarily located on an experiential continuum, whereby a person's current experience is shaped by their previous experience and their current experience impacts the experience it will have on their future. He notes that experiences that have been practiced by others in the past will modify the quality of the experience by those who come after. Garrison (1994) highlights that this theory emphasises growth and that the experiences by one person will change the person entirely. The conditions that interact with personal needs, desires, purposes and capacities to create an experience also play an important role. Dewey (1997) rejects any form of separation of the person from their environment as he believes experience does not simply exist intrinsically but extrinsically, where that which influences a person gives rise to an experience. In this present study, I wanted to be able to understand the participants' experiences of technology in the classroom based on their previous and current experiences and in line with their personal needs, desires, purposes and capacities.

#### 3.3.2.1.2. The Criteria of Interaction

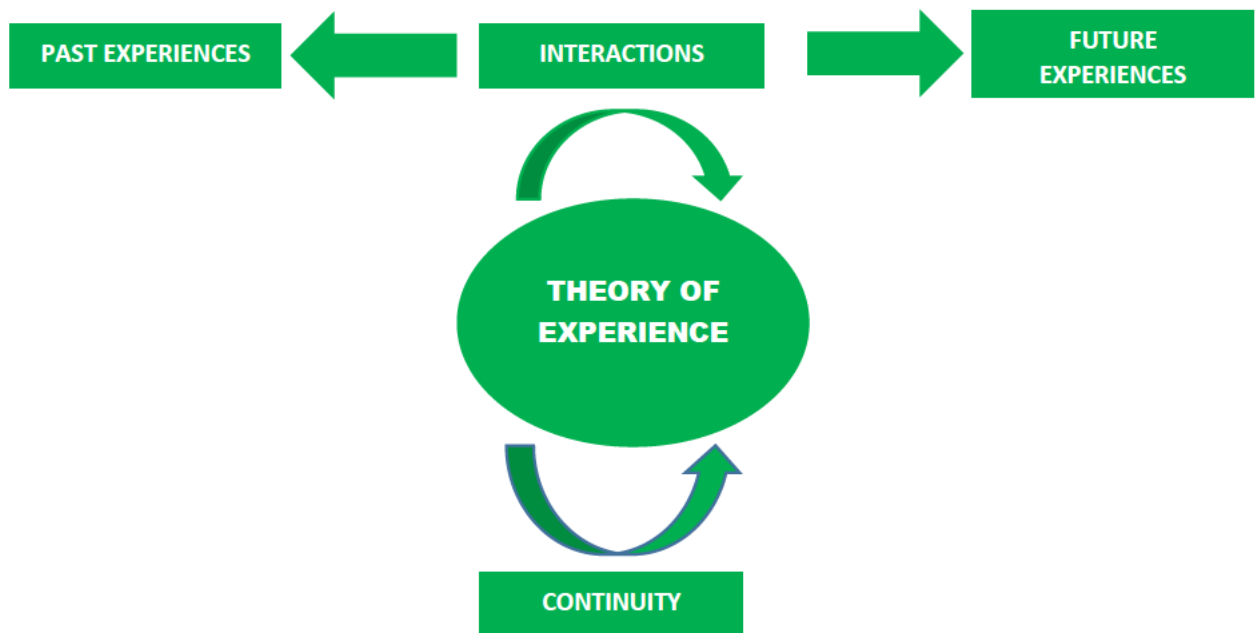
Just as a teacher's situation influences their experience, the teacher influences their situation. According to Dewey (1925), experience is shaped in the dialectic interaction between the objective and internal conditions of the person and their context. This interplay between the person's subjectivity and their environment is transactional in nature. Dewey writes, "An experience is always what it is because of the transaction taking place between the individual and what, at the time, constitutes his or her environment" (Dewey, 1938, p.43). This is Dewey's non-dualist dialectic in action whereby people interact with the social and physical world around them in a continual process of mutual adaptation, and while Dewey (1938) labels this criterion of experience as an interaction, Bredo (1997) highlights that the character of what Dewey (1938) is envisioning, is, in fact, transactional in nature. By this, Bredo (1997) noted, it allowed for changes in the character of both people and their environment. Rather than being a linear relationship between a person and their situation, Dewey is suggesting "organisms are engaged in 'trying' and 'undergoing,' in which the environment is modified and modifies the actor, in turn, in a cycle, until some result is achieved" (Bredo, 1997, p.10).

Dewey's theory of experience works with the present study as it helps explain the interaction of teachers' experiences of and attitudes towards technology with their social and physical environments. It helps to explain how the social and physical environments shape their attitudes to and experiences of technology use in the classroom.

### **3.3.3. Studies Using the Theory of Experience**

Findings by Chigona et al. (2010) suggest that learners' and teachers' experiences with digital technologies in Belgium and Taiwan had positive influences on their practices. Drawing from an African perspective, Michael and Igenewari's (2018) study in Nigeria with high school teachers indicated that teachers' digital knowledge, skills and experiences were low, which negatively affected computer literacy in the schools in which they taught. Similarly, Dlamini and Mbatha (2018) and Chigona et al. (2010) explored teachers' experiences of using digital technologies in South Africa revealed that, even though teachers had access to and experienced some digital technologies at home (for entertainment), these teachers struggled with and were uncomfortable using digital technologies citing their negative experiences with technology whilst teaching. The studies further indicated that these negative experiences were due to teachers' lack of training on digital technology use. Based on findings from another South African study, Khoza (2009) emphasised the need for digital teaching and learning to be formalised in the South African education system, thus promoting the experiences that teachers may have.

The Figure below indicates the key concepts in the Theory of Experience.



**Figure 4. Key Concepts in the Theory of Experience**

### **3.4 Implications / Limitations of the Theory of Experience**

Adnan et al. (2017) note that studies focussing on the Theory of Experience tend to focus only on the experiences of high school learners, undergraduate learners, school teachers, and university lecturers. The theory appears not to be located in studies with other populations and social contexts. However, for the purposes of the present study, the theory underpins a study working with teachers and allowed for engagement with the research questions.

### **3.5 Relationship Between the Technology Acceptance Model (TAM) and the Theory of Experience**

#### **3.5.1. The Technology Acceptance Model (TAM)**

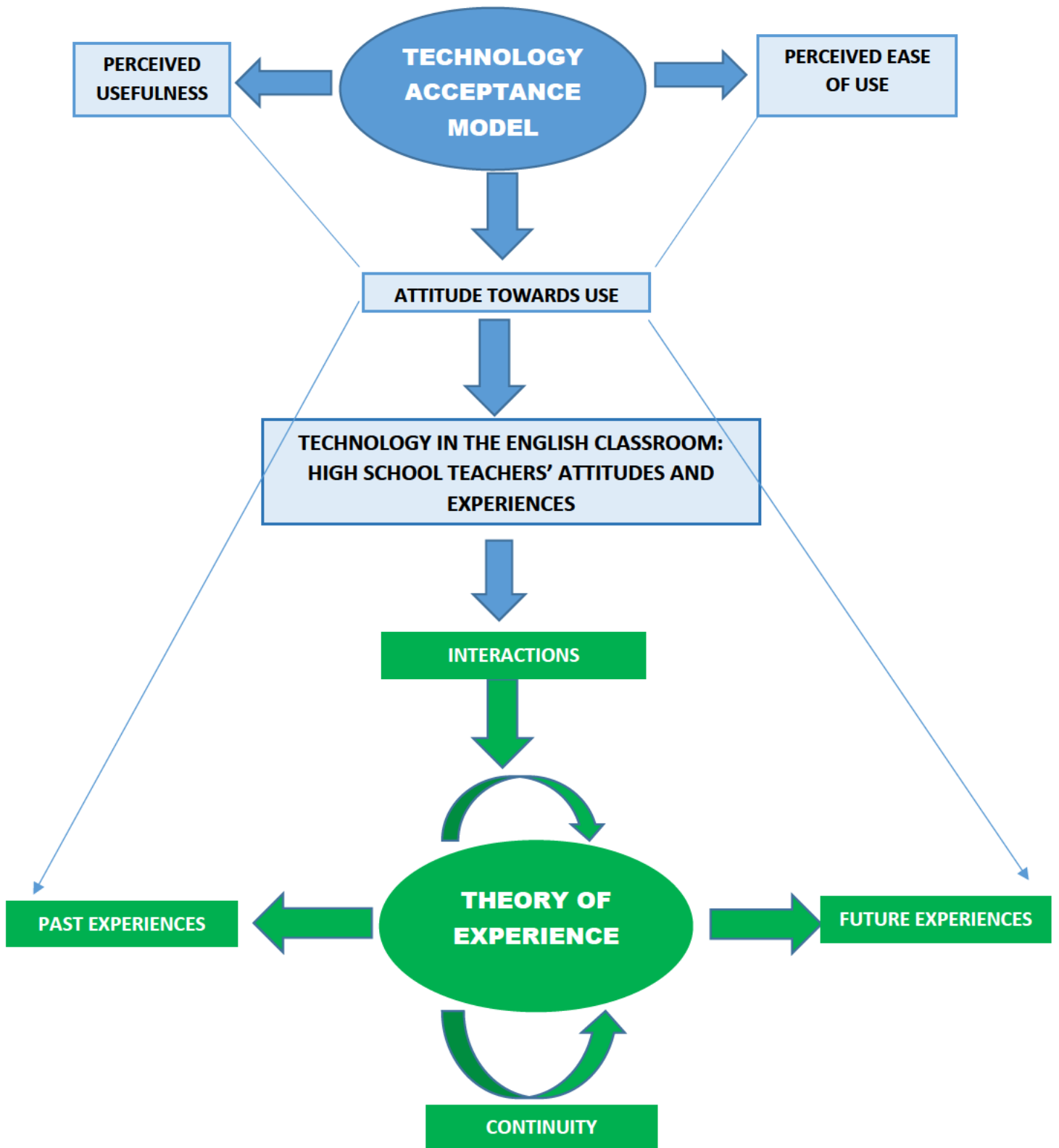
TAM's perceived usefulness, perceived ease of use and attitude towards use are the main key concepts explained. When technology is understood as easy to integrate into the classroom, it can be perceived as being easy to use (Mugo et al., 2017) and in this research study, perceived ease of use (PEoU) played a major role in determining the teachers' perceived usefulness (PU)

as to whether teachers accepted the technology usage in their classrooms. These two constructs have a strong relationship in determining the attitudes towards use (ATU). This helped to predict teachers' attitudes when intending to use and integrate technology in their classes.

### **3.5.2. Theory of Experience**

The Theory of Experience examines experience as educative, which in turn results in growth. This growth is based on the past and present experiences, which will impact on the future experiences. In this study, the teachers' experiences change them, and through their experiences, there is an opportunity for their future growth. Hence, growth will rely on the principle of continuity (Dewey, 1938) whereby these experiences will change attitudes and perceptions. Within a classroom context, teachers interact with their physical and social world around them which is a continual process of adaption. The teachers in the research study showed their interactions within their environment and how these interactions impacted their teaching methodologies using technology in the classroom.

### **3.5.3. Relationship Between the Technology Acceptance Model and the Theory of Experience in Relation to the Study**



**Figure 5: Relationship between TAM and Theory of Experience**

The above diagram demonstrates a relationship between how teachers' past and present experiences of technology-use helps to understand their attitudes towards the use of technology

(ATU), based on their perceived ease of use (PEoU) and perceived usefulness (PU), and can thus explain the continued use, or not, of these technological tools for the future.

In this way, the TAM was used to analyse English teachers' attitudes towards technology use in the English classroom, and Dewey's pragmatic theory of experience was used to analyse their experiences of technology use. These two theories assist in answering the study's research questions.

### **3.6. Conclusion**

This chapter has presented the theoretical framework underpinning the study. TAM and the theory of experience provide a powerful and insightful framework for understanding teachers' acceptance of technology and the experiences that shape behaviour and future experiences.

The next chapter will provide an account of the research methodology of this study.

## CHAPTER 4

### RESEARCH METHODOLOGY

#### 4.1. Introduction

The previous chapter presented the theoretical framework that underpins this research study. This chapter provides an account of the research methodology, which includes the research paradigm, research approach, research design, method of data generation and data analysis, the sampling of participants, and the ethical principles followed by the researcher. Aspects of non-maleficence, beneficence and limitation will be discussed within this chapter.

With a focus on high school teachers' attitudes and experiences when using technology in the English classroom, it was suitable to utilise an interpretive paradigm and qualitative research approach. This enabled exploration and understanding of these high school English teachers' attitudes towards technology use based on their experiences.

#### 4.2. Research Paradigm

This study is underpinned by an interpretive paradigm. According to Thanh and Thanh (2015), interpretivism explores and interprets participants' worlds. The interpretivist paradigm permits researchers to develop an understanding through the interpretation of data. This includes understanding human behaviour, attitudes, beliefs and perceptions, which are context dependent. This paradigm allows for the acknowledgement of numerous interpretations. Additionally, the interpretive paradigm allows for a dialogic and in-depth exploration of data. It encourages naturalistic research, where research is conducted in a naturally-occurring context with the researcher playing a non-intrusive role (Thanh & Thanh, 2015). Bergold (2012) argues that the premise of interpretive researchers is that access to reality, whether given or socially created, is only through social construction, such as language, consciousness, and shared meaning. Hence, the interpretation of these experiences leads to the development of authentic data. Moreover, this paradigm allows the researcher to ask probing and clarifying questions (Bergold, 2012).

Additionally, the interpretivist epistemological position within this study, prompted moving beyond what was already apparent (Chowdhury, 2018b). Instead of separating myself, I

became involved in creating meaning by interacting with participants through the data generation methods. For the interpretivist, active interactions with participants and data generation methods provide insight into how they construct their worldviews. Hence, the English teachers who participated in the research provided me with insights and information on their attitudes and experiences regarding the use of technology in their classrooms. The paradigm allowed for the interpretation of the participants' feelings and experiences through the interactions that took place with the individual and focus group interviews and from the open-ended questionnaire.

There are some critiques of the interpretivist paradigm (Tuli, 2010). While the interpretivist paradigm aims to gain a deep understanding of the phenomenon in a complex context rather than generalising it to other domains, it can leave gaps in the validity of the verification results (Tuli, 2010). Cohen et al. (2011) note that the research results will inevitably receive the influence of the researcher's personal values and interpretations, which often causes bias. In the case of the present study, participants were encouraged to remain as open as possible and to providing views independently, without being influenced in any way, and the researcher aimed to set aside personal feelings about the phenomenon under study. Chowdhury (2019, p. 111) states that, "the bases on which one decides what is meaningful or not, relevant or irrelevant, as well as the value of the outcome of our research, are axiological considerations." Axiological considerations point to my role as the researcher, and my understandings of values in the study in terms of what is right or wrong, and the elimination, as far as possible, of biases.

### **4.3. Research Approach**

This study aimed to generate rich, in-depth data, and chose to use a qualitative research approach. Qualitative research allows the researcher to understand people's worldviews (Bertram & Christiansen, 2020). In this study, a qualitative research approach with an interpretivism paradigm was applied to understand the attitudes and experiences of teachers when implementing technology in their English classrooms. As Barbor (2007, p.12) states, "Qualitative research seeks to unpack how people construct the world around them, what they are doing or what is happening to them in terms that are meaningful and offer rich insight." This study aimed to consider how teachers understood technology use in their English classrooms, and what their experiences were of that use. This research approach allowed the

researcher to understand the challenges and opportunities experienced by high school English teachers which played a role in their attitudes towards using technology when teaching.

This is aligned with Bertram and Christiansen (2020), who state that a qualitative approach aims to make sense of, or interpret or describe a phenomenon in terms of meanings people bring to them. Moreover, Silverman (2010, p.56) notes that “qualitative research is subjective; it is in-depth, exploratory, interpretive and open-ended in nature; studies are conducted on entities in their natural settings”. This is in contrast with quantitative studies, which are conducted in controlled settings. The qualitative approach is advantageous as it allows for the use of a variation of research methods to generate data and since it is conducted in natural contexts, participants could feel more comfortable to participate in the study. In the present study, the data was generated within the natural setting of the participants’ work environments, the schools.

As Lopes (2008, p. 15) notes:

Qualitative research, from the interpretive inquiry position seeks to understand the meaning of experiences, actions and events as interpreted through the participants and the researcher, paying attention to the intricacies of behaviour as well as attitudes and meaning in the context of where it occurs.

Babbie and Mouton (2006) state that a qualitative approach is concerned with examining and interpreting observations, and the verbal inputs and descriptions of the attitudes and experiences of the participants was captured best in qualitative research, which intended to obtain in-depth data regarding the attitudes and experiences of the teachers (Bergold, 2012). In addition, according to Bergold (2012), the qualitative approach enables the opportunity for data analysis, which includes the integration of organising, analysing, and interpreting data.

#### **4.4. Research Design**

A sound research design aims to produce results that are deemed credible. A research design is “a plan for a study, providing the overall framework for collecting data” (Leedy, 1997, p.195). Durrheim (2004) notes that a research design is a strategic framework for action that acts as a link between research questions and the execution or implementation of the research strategy and Bertram and Christiansen (2020 study, p.40) indicate that “A research design is a systematic plan of how the researcher will generate data that is needed to answer the research questions.”

This study design utilises the case study as one of the most widely used and accepted means of qualitative research methods (Bloomberg & Volpe, 2022). McMillan and Schumacher (2010) define a case study as a plan for selecting participants, research sites, and data generation procedures to answer the research questions. Thomas (2011, p. 512), points out that a case study is “an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, program or system in real life”. As Simons (2009) cautions, a case study should not be viewed as a method or methodological choice. Rather, the choice is based on what is to be studied by whatever methods are most suitable. Baxter and Jack (2008) point out that a case study has the potential to deal with simple and complex situations, as it enables the researcher to answer the “how” and “why” type questions, while taking into consideration how a phenomenon is influenced by the context within which it is situated.

I decided that the best research design to adopt for this study was the case study design as it enables the generation of data through different data generation methods and creates narratives that are understandable and clear to the reader. This study involved a case of seventeen English teachers from the English departments in three schools located in close proximity of each other. The design proved useful in providing the required information pertaining to the research questions and in developing a full understanding of the technology usage and experiences of the participating teachers.

#### **4.4.1. Outline of the Research Process**

Once the choice of the research title was selected, I formulated research questions that aligned with the research objectives. I recruited English teachers from three different schools, seven of whom were from the school where I am currently teaching, and five teachers each were recruited from neighbouring schools. To contact these teachers, I liaised with them via WhatsApp chat groups (set up previously for English teacher engagements) so we could meet and discuss the importance and relevance of the study, and also to ask if they would be interested in participating. The importance of the study was explained and teachers were assured that if they did not want to participate, they would be free to decline. All participants were eager to be part of the study. They were each given an informed consent form to complete, outlining all ethical considerations (Appendix C).

The three data generation methods that were used were open-ended questionnaires, individual interviews and focus-group interviews. I began with the open-ended questionnaires, which

were completed over a period of five days. I chose this method first, because it was less time consuming, and teachers were able to complete the questionnaire within the given period of time. Fourteen out of seventeen teachers participated in the open-ended questionnaires, four were from Maplewood Secondary (P5, 6, 7, 12); four from Riverdale Secondary (P1, 8, 9, 10); and six from Sunset Vally Secondary (P14, 2, 3, 4, 11, 13). I collected all open-ended questionnaires from the teachers.

The next method of generating data was done through the individual interviews. The participants that took part in the individual interview were P5, 6, 7, 12 (Maplewood Secondary) and P1, 8 (Riverdale Secondary). Teachers at Sunset Valley Secondary were unable to participate in the individual interviews, due to time constraints and unavailability at the times given to conduct the interviews. The individual interviews took place over a period of two weeks, where it was necessary to work around the schedules of teachers as well as their availability. Interviews were approximately 15 minutes each and was conducted at times suitable to the participating teachers. One teacher, although eager to participate, could not find a suitable time and suggested a Zoom interview, which worked well. Because of intermittent connectivity issues, that interview lasted approximately 30 minutes.

The final method of data generation was the focus-group interviews which took place within a week. Two focus groups were held. One group comprised P7, 15, 16, 17 (Maplewood Secondary) and the approximately 28-minute focus group was held after school. The second group comprising P9, 10 (Riverdale Secondary) and P11 (Sunset Valley Secondary) opted for a Zoom focus group. The Zoom focus group interview took almost 30 minutes. In both groups, the participants were very interactive and shared similar experiences and views.

During both the individual and focus-group interviews, I used an app called Otter to assist me with the recording. The transcribing and analysis took almost a month and a half for a detailed data transcription and initial analysis.

## **4.5. Recruitment and Sampling**

### **4.5.1. Recruitment of participants**

#### **The Schools**

The study worked with level one, two, and three teachers (teachers, heads of departments, deputy principals) in three urban secondary schools in KwaZulu-Natal, located in a predominantly Indian working class area that is closely surrounded by informal settlements and

draws many learners from these settlements. The staff of these schools comprise Indian and African teachers. The staff at these schools are predominantly female, with very minimal male management. The staff at these schools varied greatly in terms of age and experience. The technological resources at these three schools comprised one E-Learning / Media Centre at each school.

I chose to conduct research at secondary schools, where because I teach at Maplewood Secondary school, and the two other schools, Riverdale and Sunset Valley Secondary were neighbouring schools, and therefore conveniently situated. Gatekeeper permission was obtained from principals and informed consent was obtained from the teachers.

Maplewood Secondary school's deputy principal and the Head of Department for the Languages along with seven English teachers participated in the study. The School is located in Verulam, Durban. The school has multiracial learners and teachers. Learners attending the school come from different socio-economic backgrounds and geographical locations. Many learners come from the neighboring townships, where many learners live in poor socio-economic home environments and others live in average to above average socio-economic households. The number of learners at the school currently sits at 1250 with a staff of 40 permanently employed teachers. There are five departmental heads and two deputy principals. The school has been classified as Quintile 4, which means that the school is a fee-paying school, is generally located in affluent communities, and school fees are received from parents together with minimal state funding (Motala & Sayed, 2009), therefore, all learners pay school fees. The quintile system has been designed to "redress equity and quality" (DoE, 2006, p.12) in the education system, as stipulated in the 2000 National Norms and Standards for School Funding. A comprehensive and varied curriculum is offered at the school and caters for learners with different abilities and skills. Maplewood Secondary School offers a range of extra-curricular activities, which has led to learners achieving provincial and national accolades. The school aims to keep abreast with 21<sup>st</sup> century teaching methods and advancements with the hope of receiving resources through sponsorships for this implementation. I chose this school to conduct my research, as I am a teacher of English at this school, which helped me to explore and understand the attitudes and experiences of teacher-colleagues regarding technology use in the English classroom.

The second school used in this study is Riverdale Secondary school, where five level one teachers from the English department participated in the study. The school has a staff of 34,

1278 learners, and a principal and two deputy principals. The school is a Quintile 4 school, which means, like Maplewood Secondary, that it is also a fee-paying school and all learners pay school fees. However, the school takes in learners from poor outlying areas and learners' poor socio-economic backgrounds affect aspects of their lives, which impact on their performance at school. The school has a racial population of majority Black African learners, who come from neighboring townships, which are poor communities on the outskirts of Verulam suburbs. The school strives for educational excellence and is committed to fostering a school environment that is conducive for learning, growth, and advancement for the learners. The school's vision and mission strives to provide both quality education and extra-curricular activities. The school, however, does not have enough funding to provide technology in all of the classrooms, which posed a challenge to teachers, but they hoped to secure sponsorships for their Media Centre.

The third school was Sunset Valley Secondary. I used five English teachers from Sunset Valley in the study. The school consists of 1300 learners and a staff of 44. The school is a Quintile 5 school, which differs from both Maplewood and Riverdale secondary, and for that reason, receives very little financial assistance from the government. It is a fee-paying school and all learners are required to pay school fees. The diversity of learners varies, with learners coming from areas near to the school such as Mountview, Brindhaven, Lotusville and Oaklands. The school's principal and staff pride themselves on academic excellence as well as sports and other activities like debates and quiz programmes. The school embraces the use of technology and hopes to have technological devices in all classrooms in the near future to make teaching a fully technology-based teaching and learning method.

## **Participants**

The recruitment of teachers needed for the study was based on certain criteria, including English teaching expertise and exposure to technology. This is discussed in detail below. Throughout the process, I was transparent towards and respectful of my participants. Rich and detailed responses were given by the teachers in all methods of data generation which assisted in answering the three research questions, and meeting the objectives of the study.

#### **4.5.2. Sampling**

According to Etikan, Musa, and Alkassim (2016), sampling is the act, procedure, or method of choosing a representative sample or portion of a population in order to ascertain the parameters or features of the entire population in order to observe and draw conclusions about that population.

The study used both purposive and convenient sampling techniques to select both the schools and participants. According to Parahoo (1997, p. 232), “purposive sampling is seen as a method of sampling where the researcher deliberately chooses who to include in the study based on their ability to provide necessary data.” Nieuwenhuis (2010) also noted that in purposive sampling, the participants are selected based on some defining characteristics that make them the holders of the data needed for the study. In other words, purposive sampling focuses on participants who share common factors, goals and ambitions. Therefore, the main aim of purposive sampling in qualitative research is to select and study a small number of people or cases in which the study can help produce a wealth of detailed information and an in-depth understanding of the people, cases, and situations (Denzin & Lincoln, 1998). Purposive sampling was suitable for this study as the seventeen teachers who were selected for this research are within the same district and are of neighbouring schools. This method of sampling recruited participants with specific expertise, knowledge and experiences in relation to the research questions, which provided valuable insight, and the in-depth exploration of specific experiences to enable the researcher to gather detailed information regarding the research questions. The sample was relatively small, which made the study both feasible and practical.

The criteria for the participants of the study was based on the relevance to the research topic because their experiences and attitudes were relevant to the research topic. It also provided variety, which included a diverse range of perspectives and characteristics which were relevant to the research questions. This also helped to capture a more comprehensive understanding of the topic being researched and the accessibility of these teachers also influenced the sampling criteria as they were easily accessible and willing to participate in the study. According to Sharma (2017), researchers acknowledge that, while purposive sampling offers several advantages, it also comes with certain limitations, such as that the findings may not be easily generalised to the broader population, as participants are selected based on specific characteristics, where the results may not be a representative of the entire population. Another limitation was that purposive sampling introduces the potential for bias, as the researcher’s

judgement in selecting participants is based on certain criteria might inadvertently introduce bias to the sample affecting the validity of the study. As the researcher, I tried to overcome this limitation by striving for objectivity in all aspects of the research when it came to the data generation, analysis, and interpretation by not letting personal biases influence my decisions. I also used the triangulation method, which allowed me to utilise three methods of generating data which helped me to ensure that my conclusions were based on diverse evidence from the participants, rather than solely on the researcher's perspective.

The second method of sampling used was convenience sampling, which, according to Saunders et al. (2012), is a non-probability sampling technique where researchers select participants based on their accessibility and proximity. It is a method often used for its simplicity and convenience. This sample, however, may not be representative of the population at large. Yin (2011), in agreement with Cohen et al. (2018) understands that convenience sampling points to selecting participants due to their availability and suitability for the study. Briggs et al. (2012) state that convenience sampling speaks to a situation wherein the researcher has easy access to the site being considered. Hence, as the researcher, it allowed me to generate my data easily and quickly, without the complexities and resource-intensive nature of other methods of sampling, which made it suitable to accommodate tight time constraints and the contextual responsibilities of the schools and teachers participating.

The teachers varied from teaching levels one to three, and were chosen because they had teaching experience using technology in the English classroom. The choice of the secondary schools for the study was also purposive, due to the access of these schools being neighbouring to the school at which I teach, and also the study is purposively limited to the English teachers of these schools. I also selected the two nearest in geographic location to my own site, for convenience. The criteria for the participants in this study was also based on their availability and willingness to participate in the study.

#### **4.5.2.1. Description of the sample**

Tabulated below is the biographical information of the participants as provided by them, using pseudonyms. According to Wang et al. (2010), a pseudonym is given to a person or group for a particular purpose, which can differ from their first or true name, to protect their identity,

hence the true names of the participants are not mentioned, so as to ensure anonymity and confidentiality.

**TABLE 3.1. Participants**

<b>Name</b>	<b>Name of schools (pseudonym)</b>	<b>Gender</b>	<b>Race</b>	<b>Age</b>	<b>Years of teaching experience</b>	<b>Teaching level</b>	<b>Data generation method</b>
Participant 1	Riverdale Secondary	Female	Indian	40s	11-15 years	1	Open-ended questionnaire/ Individual interview
Participant 2	Sunset Valley Secondary	Female	Indian	50s	Over 25 years	1	Open-ended questionnaire
Participant 3	Sunset Valley Secondary	Female	Indian	40s	16-20 years	1	Open-ended questionnaire
Participant 4	Sunset Valley Secondary	Female	Indian	30s	11-15 years	1	Open-ended questionnaire
Participant 5	Maplewood Secondary	Female	Indian	40s	16-20 years	1	Open-ended questionnaire/ Individual interview
Participant 6	Maplewood Secondary	Female	Indian	40s	21-25 years	3	Open-ended questionnaire/ Individual interview
Participant 7	Maplewood Secondary	Female	Indian	20s	1-5 years	1	Open-ended questionnaire/ Individual interview/Focus-group interview
Participant 8	Riverdale Secondary	Male	Indian	20s	1-5 years	1	Open-ended questionnaire/ Individual interview

Participant 9	Riverdale Secondary	Female	Indian	30s	6-10 years	1	Open-ended questionnaire/Focus-group interview
Participant 10	Riverdale Secondary	Female	Indian	20s	1-5 years	1	Open-ended questionnaire/Focus-group interview
Participant 11	Sunset Valley Secondary	Male	Indian	20s	1-5 years	1	Open-ended questionnaire/Focus-group interview
Participant 12	Maplewood Secondary	Male	Indian	30s	6-10 years	1	Open-ended questionnaire/Individual interview
Participant 13	Sunset Valley Secondary	Female	Indian	30s	6-10 years	1	Open-ended questionnaire
Participant 14	Riverdale Secondary	Male	Indian	20s	1-5 years	1	Open-ended questionnaire
Participant 15	Maplewood Secondary	Female	African	30s	6-10 years	2	Focus-group interview
Participant 16	Maplewood Secondary	Female	African	30s	6-10 years	1	Focus-group interview
Participant 17	Maplewood Secondary	Female	African	30s	1-5 years	1	Focus-group interview

The sample consisted of seventeen teachers who were purposefully and conveniently selected to participate in the study. Seven teachers were selected from Maplewood Secondary, where five were at Level One (teachers whose main role is in the classroom to educate, instruct and foster learning), two teachers were part of the School Management Team (SMT), which were the Level Two Head of Department for Languages, and the deputy principal, who also is part of the Languages Department. Five teachers from Riverdale, and five from Sunset Valley

Secondary, consisted of only level one teachers. No SMT members chose to participate from these two schools, indicating that they were unavailable due to time constraints.

Drawing on Table 3.1 above, in terms of gender, the study comprised of thirteen females and four males, and in terms of race, there were fourteen Indian teachers and three African teachers. In terms of age, there were five teachers who were in their 20s, seven in their 30s, four teachers were in their 40s, and one was in their 50s. The teaching experience also varied amongst the teachers at the different school. There were six teachers from Maplewood, Riverdale and Sunset Valley that had a teaching experience of 1-5 years; five teachers with 6-10 years teaching experience; two teachers had 11-15 years of experience; two teachers with 16-20 years of experience; and one each with 20-25 years and over 25 years of teaching experience. The diverse age groups provided insight into understanding their experiences and attitudes of technology.

From the seventeen participants that participated in the study, fifteen completed the open-ended questionnaire which were participants one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen and fourteen. The three other English teachers which were participants fifteen, sixteen and seventeen declined and indicated a willingness to engaging during the focus-group interviews. From Maplewood Secondary, four of the seven English teachers participated in the individual interviews which were participants five, six, seven and twelve, and three teachers declined citing time constraints. However, four out of the seven Maplewood teachers who were participants seven, fifteen, sixteen and seventeen participated in the focus group interview, with three teachers indicating a lack of availability. At Riverdale Secondary, all five teachers participated in the open-ended questionnaire which were participants one, eight, nine, ten, fourteen, participants one and eight in the individual interview and participants nine and ten in the focus-group interview. Three teachers were not able to participate in the individual interviews, and three were not able to participate in the focus-group interview due to being unavailable at the same time. At Sunset Valley, all five teachers who were participants two, three, four, eleven and thirteen participated in the open-ended questionnaires and only one teacher was available to participate in the focus-group interview via Zoom which was participant eleven, with two teachers from Riverdale Secondary. The remaining four teachers felt an interview, both individual and focus-group, would be time-consuming, and asked if they could be excluded from those data generating methods.

#### **4.6. Ethics, Gatekeeper Approval, Informed Consent**

Ethical issues are defined by De Vos et al. (2011) as a set of moral principles suggested by an individual or a group and are subsequently widely accepted as rules governing behaviour and conduct between research participants and researchers. According to Babbie (2010), there might be a conflict between the goals of the study and the participants' right to remain anonymous when doing research. Therefore, views and standards of conduct regarding what is right or wrong in performing research are central to the field of ethics in research. Therefore, ethical guidelines serve as the benchmarks and foundation for how each researcher ought to assess their own performance and ensure that the code of principles is followed in order to prevent harm.

Prior to commencing the study, ethical clearance (see Appendix A) was sought from the University of KwaZulu-Natal, the Humanities and Social Sciences Research Ethics Committee (HSSREC). Gatekeeper Approval (see Appendix B) was successfully obtained from the principals of the school and permission was granted to conduct the research at the schools which required access to the teachers at the schools to obtain the data needed for the research study. It was also my responsibility as the researcher to provide my participants with all relevant information regarding the purpose of the study, the time required, when interviews were being conducted and the protocols that would be followed. The participants were provided with consent letters informing them about the nature of the study, the assurance of anonymity and confidentiality, and that participation was voluntary and they were free to withdraw at any time. One of the primary ethical considerations that the study's participants provided was their informed consent (see Appendix C). Following the briefing provided by myself before conducting the research, the participants granted their voluntary participation in the study and acknowledged that they understood it by signing the consent form. Hence, the ethical standards were adhered to.

#### **4.7. Data Generation Strategies**

There are many different strategies that may be used for data generation. This study employs three methods of data generation strategies which were an open-ended questionnaire, individual semi-structured interviews, and focus-group interviews.

#### **4.7.1. *Open-ended Questionnaires***

Ahmad (2012) defines a questionnaire as a set of questions based on a topic which is designed to be answered by the respondent. Similarly, Bertram and Christiansen (2014) note that a questionnaire refers to a list of questions that respondents answer and can contain open-ended or closed-ended questions. An open-ended questionnaire relates to questions that do not provide participants with a pre-determined set of answer choices, but instead allows the participants to provide responses in their own words (Hyman & Sierra, 2016), thereby allowing respondents greater leeway and freedom to be specific in their response based on how the questions are phrased. In contrast, closed-ended questions restrict respondents to a list of options from which they must select. Qualitative studies that utilise open-ended questions allow for researchers to take a holistic and comprehensive look at the issue being studied, because open-ended responses permit participants to provide more options and opinions, which give the data diversity (Allen, 2017). The participants included some close-ended questions relating to gender, race, age, and teaching background/level, but the majority of questions were open-ended to elicit responses based on their attitudes and experiences.

The usage of an open-ended questionnaires (see Appendix 1) in this study worked well with the English teachers at the schools, because the questionnaires were a quick way to gather information from the participants based on their attitudes, experiences and views regarding technology usage in the English classroom. According to Rao (2005), the use of open-ended questionnaires helped in explaining and gaining insight in understanding a context or situation within a study. This method also does not take a long time to administer and complete, and is a cost-effective method of generating data (Rao, 2005). Because the questions in the questionnaires were open-ended, it provided the English teachers an opportunity to elaborate and share their personal experiences or opinions about the questions at hand (Tymms et al., 2012). Fourteen participants filled in the open-ended questionnaire. When handing the questionnaires to the teachers to complete, I assured them of confidentiality and that the information provided would only be used for the intended purpose. I explained the questions briefly to the teachers to enable clarity, and told them that I would collect the questionnaires in a week and that I would collect the questionnaires personally from them. The open-ended questionnaire focused on research questions One, Two and Three, which dealt with the experiences and attitudes of teachers to technology and how the experiences and attitudes shape their pedagogical decisions in the English classroom.

The participants provided descriptive responses based on the themes relating to the research questions in their own words. This was advantageous, because it provided more insights about the participants' understandings and experiences, which may not be captured by close-ended questions. The participants also elaborated their responses by providing in-depth information which resulted in richer and more detailed information, which is valuable in qualitative research (Tymms et al., 2012). The participants may also have felt more engaged and empowered when expressing their opinions in their anonymous questionnaires.

#### **4.7.2. Interviews**

An interview is “a specialized form of communication between people for a specific purpose associated with some agreed subject matter” (Anderson, 1990, p.222). According to Cohen, Manion and Morrison (2007), interviews are a qualitative data generation method where a researcher engages in direct, interactive conversations with participants to gather in-depth information. The main purpose of the research interviews is to obtain research-relevant information and achieve the research objectives of describing, predicting, or explaining the phenomenon, as the use of interviews is highly desirable for obtaining information based on emotions, feelings, experiences, and insider and other experiences.

##### **4.7.2.1. Individual Interviews**

Individual interviews are widely used in qualitative research as a strategy to generate information about a participant's experiences, views and beliefs concerning the research topic of interest (Lambert & Loiselle, 2007). According to Anderson and Ohlen (2005), individual interviews permit the researcher to probe and explore hidden meanings and understandings. The choice of this data method is appropriate in providing valuable information about the participants' attitudes, experiences, and perspectives based on the topic of research and thus, being a useful form of data generation in qualitative research. Anderson and Ohlen (2005) state that one-on-one interviews are effective in gaining understanding of each participant's personal meanings and experiences.

To address the study's research questions, I conducted a semi-structured interview (see Appendix 2). A semi-structured interview involves the researcher posing pre-determined questions and obtaining information from the participants' responses or behaviours (Creswell, 2008). The semi-structured interview is focused and structured, and the researcher creates specific questions with the respondents in mind. According to Arksey and Knight (1999), semi-

structured interviews are simply conversations between the researcher and participant in which the researcher knows what s/he wants to determine. The flexibility of semi-structured interviews is well suited to asking ‘why’ questions in order to make sense of the research questions. Arksey and Knight (1999) note that semi-structured interviews constitute versatile means of generating data and provide opportunities to develop a deeper understanding of the answers to research questions through the means of discussion.

Using semi-structured interviews, six English teachers were interviewed over a period of two weeks in order to accommodate teachers’ availability. In an attempt to make each participant comfortable during the process of the individual interview, I outlined the objectives clearly and explained the purpose of the study, and scheduled interviews with each of the participants at a mutually convenient time and place. As the interviewer, I built a rapport with the participants so that they did not feel intimidated, and also asked pointed questions which prompted the participants to further explain. This data method was suitable for this study because, according to Bertram and Christiansen (2014), such interviews are crucial for describing and understanding people's perceptions that may be distinct. I picked a semi-structured interview as the “interviewer is allowed to develop each situation in whatever way he wants” (Rao, 2005, p. 101). According to Rao (2005), a semi-structured interview facilitates a researcher's ability to delve deeply into the issue at hand and, as a result, comprehend the attitudes and behaviours of those engaged in the situations or setting under exploration. A semi-structured interview will also help with both uniformity and depth, meaning that participants are asked the same questions, while the fact that it is semi-structured provides for the added space to go further than what is asked, and by so doing add depth and clarity to questions asked.

Each of the participants has had different experiences and different approaches to technology use in their classrooms and a semi-structured interview allowed for the sharing of such experiences and approaches. Therefore, this was an appropriate and effective way to generate data on the attitudes and experiences of technology use in the English classroom by English teachers and the participants provided insightful and relevant information, which enhanced the quality of the data. Each interview was audio recorded, with participants’ prior permission, and transcribed before analysis.

#### **4.7.2.2. Focus Group Interviews**

According to Rabiee (2004, p.655), a focus group is “a technique involving the use of in-depth group interviews in which participants are selected because they are a purposive, although not

necessarily representative, sample of a specific population.” Lewis (2000) defines a focus group interview as a carefully planned discussion designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment. According to Lewis (2000), this type of interview will yield both a more diversified array of responses, and afford a more extended basis for designing systematic research into the situation at hand. This method is appropriate for qualitative approaches, and can be used where there is some benefit in getting a ‘group story’ about a particular shared experience (Morgan, 1998). Participants in this type of research are, therefore, selected according to the criteria that they would have something to say on the topic, have similar socio-characteristics and would be comfortable talking to the interviewer and each other (Richardson & Rabiee, 2001). The reason for choosing focus-groups is due to the range of information, ideas and feelings, and different perspectives that will be provided by these groups of individuals. The members of the group selected should feel comfortable with each other and engage in discussion. The participants in the present study were comfortable with each other, because they knew each other through other forums. Krueger (1998) believes rich data can only be generated if individuals in the group are prepared to engage fully in the discussion amongst the participants and, for this reason, advocates for the use of a homogenous group. In this case, the group selected were English teachers who were similar in that they taught the same subject and grades, and had access to similar technology resources.

According to Denscombe (2007), a focus-group interview should consist of a small group of people, who are brought together by the researcher to explore attitudes and perceptions, feelings and ideas about a topic. The focus group interviews were open to all participating teachers some chose to participate while others declined. The interviews took place over a week after school hours which was convenient for all participants. Discussion was encouraged amongst the participants to ensure that the participants were comfortable with each other. The focus-group interview (see Appendix 3) was also used to obtain information from the participants who shared similar as well as different attitudes to the topic of research that highlighted their beliefs, attitudes and any experiences with the use of technology in their English classroom. It provided an opportunity for the researcher to explore and understand the teachers’ perceptions by gathering in-depth qualitative data that highlighted and explained a range of viewpoints. The interview amongst the participants was guided by the researcher, such that each participant had the opportunity to share their thoughts. The participants were engaged and built on each other’s ideas, insights and supported each other’s perspectives. By using this

method of data generation, I was able to understand the experiences and attitudes of English teachers, how they perceived the use of technology in their classrooms, and how it shaped their pedagogical decisions. Like the individual interviews, the focus group interviews were also recorded, and detailed notes were taken by the researcher (with permission from participants), and transcribed for proper analysis of the data.

#### **4.8. Data Analysis**

According to Creswell (2014), the term data analysis refers to the process of inspecting, transforming, and modelling data with the goal of discovering meaningful patterns, drawing conclusions and supporting decision-making. Data analysis is a crucial step in research, helping researchers derive meaningful information from generated data to address research questions and objectives (Creswell, 2014). Denscombe (2010) claims that, following the qualitative data analysis, principles such as collecting the relevant data, exploring and understanding the data, interpreting and presenting the findings, and ensuring that ethical standards are maintained are extremely crucial in research and will result in more efficient outcomes of data analysis.

This study used thematic analysis. According to Boyatzis (1998), thematic analysis refers to a type of qualitative analysis that is used to analyse classifications and present themes such as patterns that relate to the data. He also adds that it illustrates the data in great detail and deals with diverse subjects via interpretations. Braun and Clark (2006) define thematic analysis as a method for systematically identifying, organising, and offering insight into patterns of meaning and themes across a dataset within qualitative data. This allows the researcher to see and make sense of collective or shared meanings and experiences once the themes extracted from the data have been analysed. Thematic analysis can detect and identify characteristics or variables that influence any issue generated by participants to provide the best relevant explanations for their ideas and behaviours.

According to Boyatzis (1998) and Braun and Clarke (2013), thematic analysis uses six phases in order to analyse the data in rich detail. The first phase is to familiarise yourself with the data by immersing yourself in the data that has been generated through reading, interpreting, analysing and making sense of the transcripts. The second phase is to generate codes by systematically analysing the data by providing a label to the data that is relevant to the research, and the third phase is choosing themes that are seen in the data by identifying any similarities.

The fourth phase reviews the themes obtained and analyses them in greater detail. The fifth phase involves defining and naming the themes by also identifying any information that can be removed from each theme. The final step of thematic analysis is producing the report which would be the write-up based on the findings. The phases will be discussed in detail with reference to the study.

### **Phase One: Familiarising yourself with the data**

The first phase involved me familiarising and immersing myself in the data through the process of reading and re-reading repeatedly the textual data, which had been obtained through the transcripts of individual and focus-group interviews, the responses from the open-ended questionnaire, as well as listening to the audio-recordings of the interviews that took place. I also made notes during the interviews and these were considered as well. During this phase, I was able to underline and highlight the important keywords that linked to the research questions and objectives of the study. At this point the re-reading of the data and listening to the recordings allowed me to understand the data in its raw form and I made notes to help me understand the data. As mentioned by Braun and Clarke (2006), note-making whilst reading or even listening to data helps to read and understand it, where the researcher is not just simply absorbing the surface meaning of the words, but reading the information and listening to it actively, analytically, and critically. In this case, the questionnaire and interviews allowed for questions based on how, what and why, in order to understand the experiences and attitudes of the teachers when it came to using technology in their English classrooms. This step allowed for granular analysis. It is pivotal that the data is well read and understood so the researcher is confident with the understanding and explaining which follows. Therefore, the immersion into the data allowed me to become familiar with the content. This phase of repeated reading and listening allowed me to engage with the data, which helped me gain a deep understanding of its richness and complexity.

### **Phase Two: Generating initial codes**

The codes identified during the process of analysing are known as the building blocks of analysis and codes identify and provide a label for a feature of the data that is potentially relevant to a research question (Braun & Clarke, 2013). Braun and Clarke (2013) also add that

coding can be done at the semantic and/or the latent level of meaning. Semantic levels in research deal with explicit, surface-level meanings or interpretations of data that directly involve the understanding of the data, such as identifying keywords, sentiments in a text, and themes (Hofmann, 1999). Latent levels go beyond the surface-level meanings and delve into underlying hidden patterns, relationships or structures within the data such as identifying motivations or influences that shape the study (Hofmann, 1999) and in this study, factors that influenced teachers' attitudes were identified. Therefore, these levels can provide a concise summary of a portion of data, or describe the content of the data, and such semantic or latent codes typically stay very close to content of the data, and to the participants' meanings. Codes can also go beyond the participants' meanings and provide an interpretation about the data content (Braun & Clarke, 2013). Codes are brief and serve as shorthand for something the researcher understands that does not require elaborate explanations and by breaking down the data into manageable segments, which could be sentences, paragraphs, or meaningful units of texts, helping to focus on a specific element during the coding process.

Codes are usually always a combination of descriptive and interpretive elements (Braun & Clarke, 2013). The descriptive codes helped me organise and summarise my data in a systematic manner during the analysis stage. The interpretive codes assisted in my research study by identifying patterns and themes within the data. This allowed me to interpret the data through perspectives of the teachers and their understandings. By understanding this phase, I was able to start with the coding process in which I assigned descriptive labels and codes to segments of paragraphs obtained from the questionnaire and texts, which were highlighted from the individual and focus-group interviews, where I had written down the codes and marked the texts associated with it.

As I generated my first code from the questionnaire, I then kept reading and re-reading the data until I found something that was relevant to my objectives and research question, until a new code was needed in order to capture a piece of data. I also constantly engaged in comparing segments of data from the open-ended questionnaire with previously coded segments from the individual and focus-group interviews which allowed me to identify similarities, differences and variations which helped contribute to the coding structure. This stage of the process was finalised when my data was fully coded, and the data relevant to each code had been collated, which was done in the form of a table. This also helped me set the foundation of identifying possible themes and patterns that helped contribute to a rich understanding of the research

questions. This stage helped me identify and understand a diversity of patterns as well as codes which appeared across more than one data item.

### **Phase Three: Identifying themes**

As I moved onto the next phase, the analysis of my research study began to take shape in the form of themes. A ‘theme’ according Braun and Clark (2013, p.83), “captures something important about the data in relation to the research question, and research objectives”. This phase involved revisiting the generated codes in phase two and being familiar with the codes and the segments of the data that it represented in the study. In this phase, I also started to look for recurring patterns in the open-ended questionnaire as well as the individual and focus-group interviews, where there could have been a link, connection and similarity amongst the codes. Braun and Clark (2013) also state that the basic process of generating themes and subthemes, which are the subcomponents of a theme, involves collapsing or clustering codes that seem to share some unifying feature together, so that they reflect and describe a coherent and meaningful pattern in the data.

Therefore, I identified codes that clustered together or shared commonalities in the methods of data generation, which assisted me in identifying themes. Another important element of this stage was starting to explore the relationship between themes, and considering how themes could work together in telling an overall story about the data. Good themes are distinctive and, to some extent, stand-alone, but also need to work together as a whole in the analysis (Braun & Clark, 2013). At this phase of the study, I was able to highlight a number of themes, but also kept an open mind, as well as explored different ways of grouping codes before settling on the most meaningful themes. I also conducted comparisons across the different segments of data as well as responses from the participants, which led to the themes being evident across the entire sets of data generated, and this helped provide me with a comprehensive understanding of the research questions of the study.

I ended this phase with a table outlining the themes that were identified using the different methods of data generation, and this helped in collating all important extracts of data which were relevant to each theme and this began the process of reviewing themes. As the themes were refined, I ensured that each theme captured a specific aspect of the data from the

interviews and the questionnaire. Three main themes were established, which helped in understanding the attitudes and experiences of teachers. Themes were broken down into sub-themes which helped contribute to addressing the research questions and meet the objectives of the study.

At the end of this step, the codes were organised into broader themes that seemed to say something specific about the research questions and an important element of this stage was exploring the relationship between the identified themes and considering how these themes would work together in telling an overall story about the data based on teachers' understanding, experiences, and attitudes of technology use in the English classroom. I developed concise descriptions that captured the essence of each theme, which enhanced the diversity of the perspectives from the participants, and provided a meaningful narrative that was coherent.

#### **Phase Four: Reviewing potential themes**

During this phase, I was able to review, modify and develop the preliminary themes that I identified in phase three. At this point I was able to identify useful data relevant to each theme identified. The data extracted from the open-ended questionnaire and transcripts of the individual and focus-group interview was read again and considered if each response and explanation supported the theme identified and the questions that were asked in order to ensure the requirements were met. I asked: 1) Does the theme make sense? 2) Does the data support the themes? 3) Am I trying to fit too much into a theme? 4) If themes overlap, should be separate themes? 5) Are there themes within themes (subthemes)? 6) Are there other themes within the data? The main themes were broken down into sub-themes, which helped with better understanding the relevance to the research question. I was able to link the coded data to the set of themes and thereafter move onto the next stage in the review process which was reviewing the themes in relation to the data. At this point I was able to do a final re-read of the data I generated through the instruments to understand whether the themes captured the data meaningfully and were aligned with the research. I also began considering alternative interpretations in line with the principle of reflexivity, understanding that participants will each have varying or similar perspectives (Finlay, 2002).

### **Phase Five: Defining and naming themes**

Defining and naming themes in thematic analysis is a critical process that involves providing clear descriptions and assigning meaningful labels to identified patterns within the data, which is the final refinement of the themes and the aim of this phase is to “identify the essence of what each theme is about” (Braun & Clark, 2013, p.92). I was able to clearly state in my research what was unique and specific about each theme, for example, being able to sum up the essence of the three identified themes, so as to ensure that the data generated and analysed was accurately represented. Research Question One and two both had two sub-themes and research question three had five sub-themes, which provided more clarity and accuracy in understanding the attitudes of teachers, Were they positive and/or negative? What were the positive experiences and negative experiences of teachers? This provided a clear indication that each sub-theme interacted and related to each other. This phase involved selecting extracts to present and analyse and then set out the story of each theme. Clarity and accuracy must be emphasised when defining themes so that a link takes place between the research title and objectives. Creswell and Creswell (2017) highlight the importance of ensuring coherence is present within themes and the research findings. The themes related directly to the research objectives of the study, namely exploring the attitudes and experiences of English teachers’ technology use, understanding how English teachers perceive and experience technology use, and finally to explore how pedagogical decisions of English teachers are shaped by attitudes and experiences of technology use.

### **Phase Six: Producing the Report**

The final phase of thematic analysis was the write-up. Producing the report and using thematic analysis, involves the presentation of the identified themes, their definitions and supporting evidence in a clear and coherent manner (Braun & Clark, 2017). The presentation of my data, which was extracted from the data instruments, was organised, and I aimed to report them in a logical manner. There was coherency between the data and the themes, which aligned with qualitative research. Each theme was introduced with a concise overview, and the research questions were emphasised with its relevance to the thematic introductions (Braun & Clark, 2006). Braun and Clark (2006) note that great importance ought to be placed in the presentation of themes, which must be connected in a logical and meaningful manner, as each theme must build onto the next so that a coherent story and understanding is created about the data.

I integrated evidence, in the form of quotes, into the themes in order to provide rich detail and to aid credibility of the analysis. I also linked my theoretical framework comprising the TAM and the theory of experience to the findings, which provided insights on how attitudes and experiences are theoretically determined and the data generated supported this theoretical framework. The findings were discussed and implications of each theme were explored with reference to how they each contributed to the broader understanding of the research questions. Each theme linked to one another, and a comparison was done using all data instruments. I also examined the data to determine how it spoke to the literature I had cited.

Overall, thematic analysis provided a complete approach to uncover numerous cross-references between the evolving themes and all data (Denzin & Lincoln, 2018). Thematic analysis allowed me to connect the numerous thoughts and opinions of participants and compare these to data collected in different situations at different periods from other or the same individuals throughout the study.

The analysis was done using an inductive approach and according to Creswell and Clark (2011), an inductive research approach would involve working from the “bottom up” in which the views of the participants are used to build broader themes and by interconnecting the themes. An inductive approach, as defined by Bryman (2016), is characterised by moving from specific observations to broader generalisations, allowing theories and patterns to emerge from the data itself. This approach was appropriate for the study as the data obtained from the open-ended questionnaires, and the individual and focus-group interviews derived concepts, themes as well as interpretations that were made from the raw data in order to understand the experiences and attitudes of teachers when it came to technology usage in their classrooms. I utilised this approach in my study by gathering information and identifying patterns based on the data that was generated (Merriam & Tisdell, 2016).

#### **4.9. Storage of data**

The storage of data in research is a critical aspect that involves managing and preserving research data throughout the research process. Proper data storage ensures the integrity, confidentiality and accessibility of the data (Gie & Beyers, 2014). The data obtained from the research will be locked and stored for five years, as per the University requirements, and the data will be shredded or burned after five years. During my research, the data I had generated

from my participants during their questionnaires, and individual and focus group interviews was accessible only to me and I was able to share the data with my supervisor. Passwords, encryption and secure authentication methods were used to protect against any unauthorised entry. The data retrieved was backed up frequently to prevent any loss in the case of hardware failures, data corruption, or accidental deletions. Compliance with the protection and privacy regulations were adhered to during the research process.

#### **4.10. Trustworthiness**

Trustworthiness is one way researchers can persuade themselves and readers that their research findings are worthy of attention (Lincoln & Guba, 1985). As Cohen, Manion and Morrison (2007) note, trustworthiness in qualitative research is fundamental, for without it, research findings can be deemed worthless. Lincoln and Guba (1985) define the concept of trustworthiness by introducing the criteria of credibility, transferability, dependability, and confirmability to parallel the conventional quantitative assessment criteria of validity and reliability. These criteria and their activities are discussed below with reference to how I enabled them in my study.

##### **4.10.1. *Credibility***

Credibility is defined as the truth value that addresses the question, “To what extent are the findings consistent with reality?” (Shenton, 2004, p.64). This criterion pertains to how the social reality under study is represented, and it evaluates the reliability of those representations for the community under examination, as well as the methods employed to elicit them (Shenton, 2004). Yin (2011) defines credibility as proof that the subject has been appropriately recognised and described, and that the research was carried out in a way that is accessible to the general public. According to Guba and Lincoln (1989), a study's credibility is established by the researchers' or readers' ability to identify the experience when it is presented to them.

A variety of approaches to address credibility were proposed by Lincoln and Guba (1985), however, triangulation of data generation was most applicable to this study, due to the three methods used to generate data. This helped enhance the credibility by cross-verifying the results from the findings, by understanding the different perspectives of the participants. The use of triangulation, according to Leedy and Ormrod (2005), raises the credibility of qualitative research.

Another way to ensure credibility is authenticity, which addresses the “fit” between respondents’ ideas and the researcher’s interpretation and portrayal (Tobin & Begley, 2004). A further way to enable credibility involves prolonged engagement with participants. Participants received two preliminary visits from the researcher in order to create a rapport and relaxed atmosphere, and to develop familiarity with the participants within a relationship of trust. The preliminary visits also served the purpose of briefly explaining to the participants the objectives of the research study, and the significance of each participant in the study. The rapport that developed prior to data generation also served to make participants feel free to voice their understandings, experiences, and attitudes without reservations.

#### **4.10.2. Transferability**

Lincoln and Guba (1985) define transferability as the extent of applicability or relevance of findings to other contexts or settings beyond the specific study conditions. Tobin and Begley (2004) argue that transferability recognises that the aim of a qualitative study can be applicable or relevant to other contexts or settings. The researcher cannot know the sites that may wish to transfer the findings; however, the researcher is responsible for providing thick descriptions, so that those who seek to transfer the findings to their own site can judge transferability (Lincoln & Guba, 1985). In addition, Lincoln and Guba (1985) emphasise that rich descriptions in a study allow readers to assess the transferability and applicability of the finding to other settings, and the data I collected from participants provided me with detailed and comprehensive descriptions and understandings of the research topic and context and the participants understandings, attitudes, and experiences.

The population of this study was based in high schools, with fairly limited technological devices for teaching and learning. Since it was not possible for the researcher to conduct research in all the schools, a sample that was representative of the schools was purposively and conveniently sampled, based on the fact that the technology use in neighbouring schools proved similar. Consequently, the research findings were transferable to the teachers and principals in similar contexts, who are integrating technology in their teaching practices. Transferability in this study was enhanced through the generation of detailed descriptions of the study’s context which was provided through descriptive data in the form of an open-ended questionnaire, along with individual and focus group interviews. This allowed for rich and comprehensive information about the study’s phenomena, which will help future readers to judge the applicability of the findings to their own situations. Being open about all the steps

involved in generating the data and providing all relevant information about the methods used also improves the transparency and transferability of the research

#### **4.10.3. Dependability**

According to Lincoln and Guba (1985), dependability refers to the stability, consistency and reliability of the study's findings over time and across different conditions. It is one of the criteria for ensuring the trustworthiness of research. Achieving dependability implies that the study's results are replicable and would not change significantly if the study were to be conducted again under similar conditions. Tobin and Begley (2004) support Lincoln and Guba by stating that dependability increases the trustworthiness of the findings by showing that the findings are consistent, and may be repeated.

This will mean ensuring that an audit trail of all steps of the research are included and checked and to achieve dependability, where researchers can ensure the research process is logical, traceable, and clearly documented (Koch, 1994; Tobin & Begley, 2004). When readers are able to examine the research process, they are better able to judge the dependability of the research (Lincoln & Guba, 1985). An audit trail also provides readers with evidence of the researcher's decisions and choices on theoretical and methodological concerns throughout the study, which necessitates a clear reason for such decisions (Koch, 1994). According to Sandelowski (1986), a study and its conclusions are auditable if another researcher can easily follow the decision trail. Furthermore, Koch (1994) contended that another researcher with the same data, perspective, and setting may reach similar results.

It becomes clear that dependability in a research study relies on being consistent and using consistent methods and procedures throughout the research process, especially when generating, interpreting and analysing data. To this end, I clearly outlined my methods of generating and analysing data so that others researchers are able to replicate the study.

#### **4.10.4. Confirmability**

Confirmability is concerned with establishing that the researcher's interpretations and findings are clearly derived from the data, requiring the researcher to demonstrate how such conclusions and interpretations have been reached (Tobin & Begley, 2004). According to

Guba and Lincoln (1989), confirmability is established when credibility, transferability, and dependability are all achieved. Confirmability, as noted by Creswell and Clarke (2011), refers to the assurance that the data generation occurs in an objective manner and a degree of neutrality exists. This is identified by the extent to which the findings of the study are shaped by the participants' responses, and not by researcher bias, motivation, or interest. As the researcher, I ensured to guard against this by considering the diverse perspectives from the participants, since confirmability ensures that the data collected and the analysis are based on the perspectives and experiences of the participants, rather than biased interpretations or personal biases of the researcher. While triangulation helps with credibility, it also helps to confirm the interpretation of the findings (Moser & Korstjens, 2018). Tracy (2010, p. 73) contends that "auditing could also be used to establish confirmability in which the researcher provides a methodological self-critical account of how the research was conducted." In order to make auditing possible by other researchers, it is a good idea that the researcher archives all data in a well-organised, retrievable form, so that it may be made available to others (Lincoln & Guba, 1989).

In this study, the research findings were also confirmed by referring back to the literature reviewed. Confirmability was highlighted through ensuring that the findings emanated from the experiences and views of the teachers who participated in the study, rather than from the preferences of the researcher. This was done by staying close to the participants' exact words rather than explaining their ideas for them. I also ensured that an audit trail was maintained and transparent at all times, which would allow other researchers to assess the research process.

#### **4.11. Limitations**

Wolery et al. (2018) deliberate on the constraints, weaknesses or challenges inherent in the research design, methods or data collection that may affect the interpretation, generalisability or validity of the study's findings, emphasising the need to identify and acknowledge limitations as a critical aspect of research transparency and integrity.

Only seventeen teachers participated in the study, making it limited and restricted research. There were also teachers who did not want to participate in the interviews but were prepared to answer the questionnaire, raising questions about their reasons for declining to participate. While participants requested not to be disturbed during their free periods, their availability

after school hours was often difficult to arrange. However, after much negotiation and adjustments to the schedule, it was possible to find some time to meet.

Some of the limitations when using the questionnaire were that the responses could have been biased, as participants could have provided socially desirable responses, which could have impacted the accuracy of the data. The open-ended questionnaire required long responses and the use of many questions may have also put teachers off from answering, because they may have found it time-consuming. While certain teachers refused to answer the open-ended questionnaire, others did answer it, and the use of multiple data sources assisted to limit any possible bias.

Another limitation was that teachers found both the individual and focus group interviews time consuming. Many teachers were unavailable at the same time to conduct the focus group interview collectively, where a Zoom interview was conducted for the three teachers who could not meet during the given time. As the face-to-face interviews were conducted, I also implemented the same structure for my online participants. I used a trustworthy platform which was Zoom to conduct my interviews with the teachers who were unavailable during school hours. I explained the purpose to my participants and ensured the questions were directly aligned to the research questions and objectives. I mentioned to my participants that there could be possible technical issues however should that occur questions will be repeated. Participants were asked for their consent to be recorded, which they agreed to so that their responses could be reviewed accurately. Participants were also informed that this platform used for the interview is secure and their names/recordings are confidential.

Some teachers also appeared to feel uncomfortable discussing their responses with a group of other teachers during the focus group interviews, and some responses may have not been shared in honesty. Therefore, the methods of triangulation served to cross-check the interpretations, understandings and experiences of the participants.

There was also the possibility that the contextual challenges were not fully captured. Such a limitation would have limited the depth of understanding. However, methods of triangulation were used to validate the themes and findings so as to enhance the credibility and richness of the analysis. The interpretation of the researcher could also have influenced the interpretation of themes, which may have led to biased interpretations. Similarly, the nature of reporting could have resulted in limitations, such as the lack of objectivity on the part of participants

in their perceived and reported information, based on personal beliefs or experiences. Overall, I aimed for objectivity, and I urged participants to do the same. The many data sources would have helped to overcome some limitations.

#### **4.12. Conclusion**

The above discussion outlined the research methodology followed in the search for an understanding of teachers' attitudes and experiences when using technology in their English classrooms. The qualitative case study research design and the relevant qualitative methods for data generation were explained. The discussion indicated how the data was analysed using the systemic process of coding, categorisation and interpretation. The various measures needed to ensure trustworthiness of the study were explained. The ethical issues which are of importance to this study were also highlighted.

Chapter 5 to follow presents the analysis, interpretation and discussion of the generated data

## CHAPTER 5

### DATA PRESENTATION AND DISCUSSION OF FINDINGS

#### 5.1. Introduction

The previous chapter discussed the methodology used in this study. This chapter presents data generated from participants using open-ended questionnaires, individual interviews and focus group interviews. The individual interviews and focus group interviews were audio recorded and were transcribed verbatim. Themes developed through the analysis of data and a discussion of the findings are presented.

#### 5.2. Data Analysis: Themes

Presented below are three themes that were identified from the data generation tools.

Themes	Sub-Themes from the Data Generation Tools
<b>Theme 1:</b> High School English Teachers' Attitudes, with Reasons, to Technology Use in the English Classroom	<ul style="list-style-type: none"><li>• High School English Teachers' Positive Attitudes to Technology Use in the English Classroom</li><li>• High School English Teachers' Negative Attitudes to Technology Use in the English Classroom</li></ul>
<b>Theme 2:</b> High School English Teachers' Experiences, with Reasons, of Technology Use in the English Classroom	<ul style="list-style-type: none"><li>• High School English Teachers' Positive Experiences of Technology Use in the English Classroom</li><li>• High School English Teachers' Negative Experiences of Technology Use in the English Classroom</li></ul>
<b>Theme 3:</b> High School English Teachers' Attitudes and Experiences of Technology and the way in which they Shape their Pedagogical Decisions	<ul style="list-style-type: none"><li>• High School English Teachers' Attitudes and Experiences of Technology and the way in which they Shape their Choice of Teaching and Learning Methods and Strategies</li><li>• High School Teachers' Attitudes and Experiences of Technology and the way in which they Shape their Choice of Teaching and Learning Materials</li><li>• High School English Teachers' Attitudes and Experiences of Technology and the way in which they Shape their Motivation to Teach Using Technology</li><li>• High School English Teachers' Attitudes and Experiences of Technology and how they are Shaped by Factors of Time and Resources</li></ul>

**Table 5.2: Themes Identified from Data Generation Tools**

### 5.3. Presentation of Data

#### 5.3.1. Theme 1: High School English Teachers' Attitudes, with Reasons, to Technology Use in the English Classroom

##### 5.3.1.1. High School English Teachers' Positive and Negative Attitudes to Technology Use in the English Classroom

High school English teachers have varying attitudes towards technology use in the English classroom (Gray et al., 2008). While they also have different reasons for their attitudes, their attitudes are considered a major predictor of the use of technology in educational settings (Gray et al., 2008). The data from the three methods of data generation, which are open-ended questionnaires, individual interviews, and focus-group interviews, indicate that the participants in the study generally have a positive attitude towards the use of technology in their English classrooms. However, they are faced with challenges when using technology. From the open-ended questionnaire, it is noteworthy that 11 of the 14 teachers expressed a positive attitude towards the use of technology in their English classrooms. All responses are cited verbatim, where all mention of 'learners' should be understood to refer to school-aged learners.

Their responses in Q1 of the open-ended questionnaire when asked to describe their attitudes towards the use of technology when teaching English lessons indicate the following:

*I am open to the use of any technology that enhances lessons/adds to learners' understanding of concepts. In the teaching of English, technology plays a vital role in enhancing learners' understanding of literature through the use of movies, and slide-presentations. (P2)*

*Positive. I have to be positive about it because it forms part of my daily life. My learners need to be aware and be able to grasp the utility of technology in theirs, in order to be productive, competitive and successful individuals in their own lives. (P8)*

*I enjoy teaching English using technology. In the age of technology, we must embrace its use. It's not a resource, it's the resource! It gives examples of concepts that we generally teach that is abstract and shows its practical use. (P13)*

*As an educator I am aware that learners absorb new information in many different ways and there is no one-size-fit-all in teaching and using technology in the English*

*classroom. Learners are fully technologically enthusiastic and in saying that, I believe technology in the English classroom can be of great benefit to both teachers and learners. (P14)*

In the individual interviews, when asked to describe their attitudes towards the use of technology, of the six teachers who participated, five described their positive attitudes towards technology, noting

*I like to say I have a positive attitude because it makes work lighter, it covers all angles with the learners on all cognitive levels. It is just more appealing, especially in the day and age we are living in.(P1).*

Similarly, P6 noted that *“I have a very positive attitude and I’m willing to embrace new ideas and assessing new English resources, looking at different ways to get learners to interact with technology.”* and P5 indicated that *“I find it to be really uplifting as it creates a positive attitude towards me as an educator when using technology in the English classroom.”*

In Q8 of the individual interview, teachers were asked to explain, with reasons, their attitudes towards technology use. Responses included, *“We are living in a digital era and we need to evolve our strategies in the English classroom. We need to keep the tech savvy learners of this generation engaged in meaningful learning.”* (P5), *“It is very convenient and fast”* (P7) and *“I encourage educators who don’t embrace it, to use it”* (P13). It is evident that teachers believed it is important to integrate technology in their English classrooms because it is fast, efficient and also important to keep up with the new generation of learners who are “tech savvy” and in doing so, this will enhance both teaching and learning.

However, three teachers who participated in the open-ended questionnaire stated that they are open to the use of technology, but mentioned the challenges they face which changes their attitude towards usage.

*I fully support the use of technology in the English classroom - it assists in learning and increases a learner’s interest. However, there are many contextual factors to consider, i.e. not every classroom is equipped with e-learning facilities. (P3)*

Others felt that *“For teachers it is time-consuming to set up for lessons due to the inadequate resources which are shared among all departments”* (P4) and *“I find it a bother to carry it around as I am not based in one class”* (P12).

These words indicate that the teachers support the use of technology and recognise the benefits of it, but face contextual challenges that alter their attitudes towards technology use in their English classrooms.

In the focus-group interview, the seven participating teachers had positive attitudes towards the use of technology in their English classrooms. Examples of views given to the question based on their attitudes towards technology use in their English classroom include:

*“I am in favour of technology because I believe that as a teacher of the 21<sup>st</sup> century, technology is the way to go” (P7); “I am very tech savvy myself, I embrace technology and I recognise the 4<sup>th</sup> Industrial Revolution” (P9); “I feel like learners grasp the information much better and when it comes to testing, they basically recall the information much easier compared to when we use a chalkboard” (P11); and “I love using technology because growing up we didn’t have these things and were not exposed to them. And now it’s here, why not use it. It makes things so much easier and gets learners engaged in lessons” (P15).*

It is evident from the above responses, that the teachers’ attitudes towards technology use was positive, and that they saw technology integration as an enhancement of teaching and learning. The participants also believed that technology integration was easy and increased learners’ understanding of content. It is evident that the teachers cited enjoyed integrating technology in their English classrooms, they found that it made their work load easier, and the integration was innovative, thus keeping abreast with the advancements and appealing to the learners in their English classrooms.

The participants also explained their reasons for their attitudes in the focus-group interviews by noting, *“Technology is a part of our lives and we need to prepare ourselves for the ever changing generation of learners to come” (P7); “The kind of responses I get from learners when technology is used is very positive so the outcomes are usually achieved” (P9); “The times we are living in, we are in fourth IR so that means soon everything will be technology related. So we should keep using it, we should get used to it, we should go for trainings and find out more about it and make our lives better” (P15).*

However, even though P10 stated a positive attitude, it was noted that challenges are still prevalent in classrooms, where it can affect their attitudes to continued usage: *“When sound becomes a challenge; or when learners in a large classroom cannot see the screen, I feel that dampens your attitude, because you want to give your learners the best where everyone is receiving the same information.”*

Similarly, another teacher stated that, *“I would love to use technology more often, but there are so many challenges to incorporate it so I just don’t bother”* (P8). This indicated that even though P8 and P10 are in favour of technology use, but due to the challenges they face, they recognised the obstacles, and P8 did not bother to utilise technological devices. When P8 was asked to explain the reasoning behind this attitude, the participant noted: *“The system in which we operate is under-resourced. As a public education system, we are far from attaining that ideal. The education system is financially weak so it is difficult to incorporate technology.”*

Based on the findings from the questions asked related to theme one, it is evident that most participants had a positive attitude towards the use of technology in the English classroom. Each participant described their attitude towards technology and the reasons for that attitude during the individual and focus-group interviews conducted. They also highlighted what technology means to them and how they feel when they have to use it during their lessons. The 17 participants who participated in the different data collection tools understood that technology is an effective tool in the teaching and learning process, it can greatly enhance lessons, it creates an interactive classroom atmosphere amongst teachers and learners, and it is dynamic. By using these different strategies of teaching it provides great engagement and efficiency in the classroom, which means keeping up-to-date with the technological advancements when it comes to teaching and learning, thereby creating a positive attitude amongst teachers.

Broekhuizen (2016) reinforces the findings by stating that, even though it may be a slow complex process of technology integration, there has been a great transformation which has brought about the use of various technological devices in a classroom, and this has helped to develop interactive and engaging lessons among teachers and learners. In all methods of data generated, participants were in favour of technology, due to learners having a positive attitude towards the use of technology in their classes. It also showed that, by using such devices, were engaged, and understood concepts of English better. Teachers also felt that taking away the monotonous way of learning enhanced their teaching, making it more effective. According to Mustafina (2016), a teacher will display a positive attitude toward technology when the teacher is motivated, and knows how to integrate technology into the classroom learning activities. In this study it is evident that teachers were confident because of the positive responses from the learners when they integrated technology into the various aspects of English. Although the understandings of technology to the participants indicated positivity, there were participants who associated their attitudes with negative contextual factors.

According to the TAM model, the third construct, attitude towards use (ATU) helps to explain users' decision to utilise technology. The intention of this construct in the TAM is to directly influence the frequency of the use of technology to create an attitude that is either favourable or unfavourable, and in the above responses from the participants, there were eight teachers' who had associated the use of technology in their classrooms positively, and had effective responses from the learners and therefore, their attitude was positive towards the use of technology. In Davis' TAM model, perceived usefulness (PU) and perceived ease of use (PEoU) help to explain attitudes towards using technology, which then predicts and explains behavioural intention to use. The behavioural intention to use technology usually predicts acceptance to use technology (Davis, 1989). The findings align with Davis' (1989) findings. The teachers' self-reported current usage and self-predicted future usage reflect positive PUs and their current usage and possible future usage reflect positive PEOUs.

Although the participants had a positive attitude towards technology, there were participants whose attitudes were influenced by the negative contextual factors. While being aware of technology, and knowing that it brings optimal change to lessons, they stated why they choose not to use technology in the classroom. This finding echoes other research, which found that this hesitance exists due to the lack of availability of technology in their schools and classrooms, lack of support from administration in need of training and technical support, and the time it may take to even set up and integrate these types of technological devices in their classes (Oju & Adu, 2018). An early study by Ertmer (1999) found that there was concern that learners might need to share devices, which would not be appropriate when individual learning was required. In the case of the present research study, the concern was not only with learners sharing devices, but that teachers shared these devices as well, which creates a challenge when two or more teachers need to use these devices at the same time. Hence, Chapelle (2011) supports the evidence provided above, by stating that infrastructure related to technological devices needs to be supplied to schools by providing sufficient computer laboratories and devices for teachers to utilise in the classroom. In doing so, this will ensure that teacher have easy access to these tools whenever needed. Varoy et al. (2021) note that the curriculum has been re-developed in order to include technology designed to make the practices of teaching for teachers more efficient. However, there were teachers in this research study that face deterrents that affect their attitudes towards the use of technology. Research by Stover et al. (2015) states that, even though technology in the classroom provides an interactive approach between the teacher and learner, it is important to note that many schools around the world do

not have or have limited access to technology in their classrooms, and therefore, attitudes towards technology for these teachers will be poor. This corroborates Davis et al. (1989), who note in the TAM model, that it is important to understand the reasoning behind teachers' acceptance or rejection of systems of technology use. The teachers in this research study understood the relevance and importance of technology, and following this model, when a particular type of a technological device is perceived to be useful as well as easy, then continued use can be anticipated. The participants of this study would then be able to understand and see the significant changes that technology could bring in their daily lives and then the acceptance will be much greater. The participants' obstacles, "*it is time consuming to set up due to inadequate resources*", "*not every classroom is equipped with e-learning facilities,*" and "*education system is financially weak so it is difficult to incorporate technology*" reinforce those of Pinho and Soares (2011), who found that, if teachers' technology use is easy, they are able to navigate through the challenges of its use, and it provides benefit and enjoyment, then there will be continued usage and the attitudes will be favourable. However, if these users perceive the use to be difficult and unfavourable where resources are not easily accessible to them, then they will most probably find it to be limited in its efficacy, or not useful at all.

The next theme highlights teachers' experiences of technology.

### **5.3.2. Theme 2: High School English Teachers' Experiences, with Reasons, of Technology Use in the English Classroom**

#### **5.3.2.1. High School English Teachers' Positive and Negative Experiences of Technology Use in the English Classroom**

Teachers' past experiences of technology in their classrooms play a crucial role in technology adoption, as noted by Ortega and Fuentes (2015). The data from the three methods of data generation indicate that the participants in the study have had both positive and negative experiences when using technology in their English classrooms. These participants linked their positive experiences with learners being more engaged and it facilitated better learning and overall teaching, and it served as a way to prepare learners for a more technologically advanced world. However, the participants also shared their negative experiences in relation to the lack of facilities for each teacher, hence sharing of technological devices amongst the department,

as well as time constraints. The experiences of these participants will be further analysed through the generated data.

Based on the findings from the open-ended questionnaire, the 14 participants were asked in Q4 to explain their level of comfort when using technology in their English lessons and ten of these participants (P1, P2, P5, P6, P7, P8, P9, P10, P11, P12) used words such as “*comfortable*”, “*highly comfortable*”, “*confident*” and “*excellent*”, appearing to share similar views. In Q4, teachers also described their comfort levels. The participants noted, “*I feel confident to use technology as it is an effective teaching tool*” (P1); “*I find it more convenient to forward information on chat groups as the time in the class is crucial*” (P2); “*I feel highly comfortable. Technology reduces stress levels when using resources that appeal to learners*” (P9); “*I feel comfortable as I do understand the basics of technology which is necessary for my lesson. It helps me as an educator to display my creativity through power-point presentations*” (P10); and “*I feel comfortable using technology as I am tech-savvy and trained in ICT, which has readied me to be able to use technology in my lessons*” (P11). The responses indicated positive experiences with technology, highlighting its convenience, effectiveness to teach and learn, ability to lower stress levels, and feelings of empowerment in technology use because of training.

These responses were closely linked to Q1 in the individual interview, where the participants were asked to explain what training they may have had in technology use. The responses appear linked to the responses above due to the relationship between the comfort levels a teacher may have when using technology in their English classrooms and the training received in technology integration. If a teacher has received training, they would most probably feel more comfortable and confident to integrate technology in their lessons. However, if a teacher has not received any training, then they may feel less confident and prefer using their traditional methods of teaching in their English classrooms. In other words, their training may influence their experiences.

Question One in the individual interviews asked participants what training they had received in technology use, either as learners or teachers. They noted that they had done a “*Personal Advanced Computing Course*” (P1) and “*course in End-user Computing and Information Technology and obtained certificates. I also attended workshops in the Western Cape*” (P5). P7 noted that their school had sent educators for workshops, which allowed them to learn how

to work with technology and this resulted in a more positive, confident and enhanced teaching and learning experience in the classroom.

P8 and P13 shared a similar experience in which they explained their training was based at University where they registered for a computer literacy module. They noted that

*All I know about technology is mostly self-taught. With the training I received from campus, it mostly was about Microsoft office and not really using technology in the English classroom or any other classroom for that matter. It was more for administrative purposes, so I don't really think it was really effective (P8); and*

*At campus we did a computer literacy course and this introduced us to using technology, especially where we were using Word, Excel, and PowerPoint, which helped me. Now, as an educator, we have been trained at schools to use technology because we are in the 4<sup>th</sup> Industrial Revolution, and it helps us as educators, because with these devices we are able to better our results and report our results as we go forward (P13).*

This indicates that even though a computer course was done at University to acclimatise learners to computer usage, these participants believed that did not receive training on how to integrate technology into teaching methodologies. However, the teachers were open to embracing technology, recognising its importance in education and in life. They also wanted to use technology as a way to better their teaching methods for better performance.

P6 indicated that teachers did not receive any specialised training on how to integrate technology, except for workshops that were held at school where the SSS Programme (The School Support Services (SSS) Programme in South African education is part of the broader efforts by the Department of Basic Education to provide various forms of support to schools in order to enhance teaching and learning outcomes (Department of Basic Education, 2016). The Department of Basic Education (2016) further adds that this programme was designed to address barriers to learning and provide schools with the necessary resources and assistance to ensure that all learners have the opportunity to success academically and can include interventions such as professional development for teachers, curriculum support and the provision of necessary materials and resources) was introduced and implemented. P6 explained, *“Most of the technology techniques that we use is self-taught. It's left to the individual to figure things out in terms of implementation.”* This indicates that even when teachers indicate that they did not receive training, they can find ways to utilise the technology,

should they wish to. In the focus-group interviews, participants were asked the same question, that is, to explain what training they had in technology use as either a learner or teacher. Participants 7, 9, 10, 11, 15 and 17 stated that the training they received was at their universities, and it proved effective, as this was their first exposure to technology use. P7 stated that *“there was a module which taught us the basics, as well as our teaching practice module that introduced us to the OHP.”* P7 further added that this type of training at university was highly effective, because it allowed them to learn more about technology. Apart from P9 doing a computer course and learning more about technological devices, the participant noted that while doing her degree, *“I did a computer course and it was quite effective.”* At that point in the focus group interview that P9 mentioned that while it was effective learning about technology, P9 did not use it, due to the limited resources available at her school. These views shared by P9 were similar to those of P10 who stated, *“I have also done a module. However, it was just the basics and I have put it to use by using, for example, a laptop to show various slides during lessons, but again, due to limited resources, we cannot do more when it comes to showing visuals to learners.”* P11 also shared that, *“when I did my PGCE, I did receive training in terms of ICT where they basically taught us how to use tablets, laptops or basically any technology in our classrooms.”* P11 also stated that this type of training was effective in showing how this would benefit the learners, but it was unfortunate that public schools did not cater for such resources to be used in the classroom. P15 and P17 has learned the basics, such as Microsoft Excel, Word, and learning ways in which lessons can be enhanced, however P17 stated that the school P17 first went to, did not have these devices so P17 had to find other ways to teach without technology. P16 stated that, *“I received teacher training on the CPTD (Continuous Professional Teacher Development) management system”* which workshopped methods of integrating technology into the classroom, which was a helpful activity for teachers. P16 believed that as teachers begin to develop confidence through being workshopped, they become eager to try the technology. All participating teachers received some sort of training, either as a learner or as a teacher. Each believed it was effective training but some also stated how they were unable to put this into practice, due to the limited resources available at their schools. Having experienced some training in technology usage, the participants experienced technology as very useful when used in their English classrooms. Technology has been experienced as an *effective teaching tool and resources that appeal to learners*, which allowed the participants to be creative in their lesson plans when teaching using technology.

Question 10 of the open-ended questionnaire asked participants to explain the barriers or challenges when integrating technology in their English lessons. The 14 participants concluded that they experienced barriers such as inadequate resources/lack of resources, time constraints, overcrowded classes, learners' lack of devices, poor network connectivity, and lack of sponsorships for technological devices to the school for the utilisation of learners and teachers. The participants noted their barriers by stating, *“lack of resources, inadequate knowledge and skills, institutional barriers, assessment and subject culture can serve as significant barriers”* (P1); *“Overcrowded classrooms, discipline issues with behavioural problems, lack of resources especially Wi-Fi as not every classroom has good connection”* (P6); *“Not all learners have access to the Wi-Fi at school and due to loadshedding, technology cannot be used”* (P7). P9 and P12 shared a different experience of technology use with learners and noted that *“Learners work at different speeds. Not every child takes or adapts to technology easily.”* (P9), and *“Learners who come from poor backgrounds don't have access to technology at home”* (P12). Participants 13,14 and 15 all had the same experience of the lack of access to technological devices: *“Not all learners have access to technology at school and many abuse the devices for other uses.”* (P13), *“Everyone does not have full access to resources.”* (P14) and *“There is limited access to technological devices. Moving from class to class and setting up devices is time-consuming and laborious.”* (P15).

The responses from the participants mainly highlighted external factors that echoed the 2013 study of Hechter and Vermette, who stated that the main obstacles preventing teachers' technology integration are lack of resources, including equipment, lack of time, lack of or poor training opportunities, and lack of funding and poor administrative support. Due to these barriers, teachers therefore faced negative experiences of technology use in their classrooms and therefore the teachers did not experience technology to be positive in their school.

The participants were asked to explain in Q4 of their individual interviews what encouraged them to use technology and what served as a barrier to use technology. The participants shared their positive experiences, that were mainly experienced by the learners:

*The learners prefer technology because it's their tool and it is what they are doing at the moment. Learners prefer it, instead of looking at a hardcopy, instead of listening to the teacher standing in front of them and speaking for the entire lesson, they just prefer technology* (P1); and

*The fact is that learners are very technologically advanced. They're very tech savvy and they want to incorporate it, so it's something that we cannot hide away from, we cannot deny it. We are living in a technologically advanced society and we need to embrace it (P6).*

P8 very confidently stated:

*I think my zeal for teaching was revitalised when I saw that learners were eager to learn through technology. I think that technology is a much more effective resource and our performance as teachers in class is much better.*

P13 shared,

*I love using technology in my class. Technology helps our learners understand, especially in a language such as English, where they are second language speakers and it makes it difficult for them to understand. Therefore, when they are answering questions, the visuals from lessons using technology help them understand it better.*

Evidently, it can be seen that it was the learners' reaction and ability to understand and relate to technology that encouraged teachers to use technology. Learners' positive responses to technology urged the teachers to recognise its power to engage learners. It was also important that a teacher acknowledged how technology may bridge the language gap for second language learners of English.

Understanding how technology produced positive experiences for teachers and learners in English classrooms, P5 and P7 noted that teachers need to be more *"technologically equipped and trained to teach in the 21<sup>st</sup> century"* (P5). The belief was that teachers are entering a new era, with a different cohort of learners and teachers, who need to be equipped in their teaching methodologies so that they can relate to learners as P5 continued, *"we need to upgrade our skills and methodologies to teach in fun ways."* P7 also stated that with the use of technology, *"it is much faster, more efficient and easily accessible to utilise in the classroom for exciting lessons."* These views emphasise the efficiency of technology in the classroom and using it as a teaching methodology that creates exciting, interactive and creative lessons, which makes learners engaged.

In Q4 of the individual interviews, when the participants were asked what encouraged them to use technology and what served as barriers, participants pointed to the barriers such as limited resources available to teachers in their classrooms, learners not having access to obtain these

resources sent to them, and large classes which impact on the delivery of the lesson. P6 recognised a reality of South African learners and noted that

*The socio-economic factors of many learners do not allow them the access to latest technological devices. There is a divide between the advantaged and disadvantaged learner. The advantaged learner will have access to a laptop and an advanced form of laptop to download certain programmes; whereas a disadvantaged learner may have a basic entry level phone that does not accommodate the various apps, such as excel spreadsheets or a particular document that you are sharing with them. You are sharing all the information, you are sharing the resources in the hope that everyone will have access to it and download it. However, it is not always possible.*

These words indicate that, while teachers may be eager to use technology because they realise the benefits it brings to the learners, they also understand that not all learners will have direct access to obtaining these vital resources which poses an unfair disadvantage to those learners. Similarly, while P13 was enthusiastic about technology as a beneficial resource in the classroom, a major barrier was recognised. P13 noted, “*let us be realistic, this is a public school with both advantaged and disadvantaged learners and many learners do not have these devices that they can use at home and data is very expensive. So at school, I try as much as possible to use all of this technology.*” P13 clearly understood the barrier experienced by learners when trying to integrate technology. However, P13 had recognised how to overcome such barriers.

The importance of writing and how technology affected it was also highlighted. P8 noted that, while technology was vital in the 21<sup>st</sup> century and that technology lifted teachers’ burdens regarding administrative paperwork and lesson delivery using advanced resources, P8 found that learners were not fully engaged with the content of the lesson which usually required time to write out information and respond in writing to questions. P8 noted that

*The challenge I faced was deciding whether to use technology to engage learners with their work or through writing and answering questions in their books. After a lesson using technology, the learner walks out of the classroom without anything written down.*

As much as P8 wanted to integrate technology to engage learners in meaningful teaching and learning, the learners were so taken in by the devices used in the classroom and with a new method of learning, that they did not make the effort to do any written work. P8 feared that if

work was not being written, that evidence of proper teaching was not possible. In P8's experience, writing was the only source of evidence for teaching and learning.

Other barriers that affected teachers' experiences of technology were cited. P5 experienced contextual barriers such as *"lack of technological resources, such as Wi-Fi fibre connections at school and sometimes it does not pick up in all classrooms. There are constant interruptions during the lessons and sometimes learners lose focus."* P7 pointed to experiences of technology use in terms of learner numbers. P7 noted that *"there are too many kids to deal with so it becomes a barrier and there are many disruptive learners."* This indicated that, while learners may be enthusiastic about technology use in the classroom, it could become disruptive, possibly because of their excitement at what they are experiencing, which stands in contrast to the more traditional ways of teaching. This could create a negative experience in the classroom, time is lost trying to settle learners. It becomes clear that teachers need to be taught how to manage scheduling when using technology.

In Q4 of the focus group interview, the participants extended the conversation on what encouraged technology use and what served as a barrier. Each participant explained that technology was constantly advancing, that teachers need to embrace that advancement in their classrooms, that lesson preparation was easier with the use of technology, and that technology benefitted their learners' experiences of and responses to the topics covered in their classroom. This is similar to the study by Alzaidiyeen and Fong (2010), who found that teachers experienced technology in their classroom to be advantageous by indicating how computers helped organise their work and lesson preparation which saved time and effort, and using technology, such as computers in the class, made teaching and learning more effective, especially with creating an interactive classroom.

P7, P11 and P16 recognised the benefits of technology in a school, noting, *"I feel that lesson preparation is easier than having to carry textbooks and filing all the time"* (P7); and *"We are living in a technologically advanced society and it is nice to incorporate that in our lessons"* (P11). P16 stated that

*What motivated me is the fact that our learners will need technology for college and their careers, so why not start now during the learning path at school. I remember how I struggled at University using technology for the first time in my life - using the internet, having to do my research and also using the Turnitin*

*plagiarism service. Those things were all new to me and I don't want my learners to go through the same things.*

Participant 16 understood the barriers experienced personally and endeavoured to empower learners to know more and thus enjoy an easier journey in their tertiary experiences. Participants 9, 10, 15 and 17 all agreed that teaching using technology benefitted learners and the responses they experience from their learners are encouraging. The participants cited experienced their learners being more attentive and learners' concentration and attention spans were excellent, which helped learner to retain the information better. Participants also pointed out that utilising technological devices in the classroom can get through to learner of different learning levels and styles. They noted, "*Learners retain more information when they are watching something and you tend to see that they basically pay more interest, and concentration is better.*" (P10), "*They're [learners] excited and willing to learn, that's why we (teachers) want to use it more often*" (P15); and "*What motivated me is that in my class, I saw and realised that learners have different learning styles*" (P17).

The participants' experiences relate to the teacher participants in Voogt's (2012) study who had developed a high level of confidence when teaching because learners were more engaged. The participants recognised their experiences as positive largely because the learners played an active role. Dewey's theory of experience notes that growth is tied to experience and experience results in growth. Experiences resulting in growth are dependent on the relationship between the current experience and past and future ones. The interaction that teachers have within their teaching environment will depend largely on their experiences and continued usage will depend on their past experiences and this impacts the usage of their present experiences.

In Q3 of the individual interview, the participants were asked to share experiences of technology use. Based on their experiences, the participants noted, "*The technology itself worked extremely well, it ran smoothly, the learners were engaged, they were enthusiastic. They found the lesson interesting, it was interactive*" (P1); "*The strategies that worked well for me were the videos as it broke away from the monotony of the teacher talking all the time. I also incorporated games such as 30 seconds, scrabble, heads up, using my cell phone as well as flashcards and hangman. They were a huge hit amongst the learners*" (P5); "*When the learner is in the classroom, it is effective when using technology because many learners are visual learners. So when they are able to actually see the content of what you are teaching, looking at diagrams or looking at the actual text in video format, they are able to link up more*

*clearly with the block chain of themes related to the subject content” (P6); “Technology has helped save time with regards to not writing on the chalkboard, and it allows us to not turn our backs towards the learners and so we have face to face interactions.” (P7), “Learners were enthusiastic about different styles of teaching that were unfamiliar to them; they were more in tune with me in the lesson” (P8); and “In Literacy and Literature, it helps our learners understand, because they come from backgrounds where English is not their First Language and it becomes difficult for them to understand Literature, so when using devices like the computer or YouTube, our learners literally can go and find out and understand what is going on in the text, so it gives them a better understanding of the problem.” (P13).*

The participants’ sharing of their experiences pointed out that different methods and varied ways of teaching content in English classrooms worked well in keeping the learners engaged and enhancing their level of understanding. The teachers also recognised the time saving involved and the possibilities for interaction and collaboration amongst the learners and teacher. While teachers experienced what worked well for them, there were also problems experienced.

In sharing their experiences in the individual interviews, participants also pointed to the barriers experienced. They noted that *“I have large numbers in the classroom and use just a laptop without a projection screen. It limits the learners from actually seeing the entire visual on the laptop” (P1); and “There are technical difficulties as the school is under-resourced and I have to use my own data for streaming videos and carry my own cables, speakers and laptop” (P5). P6 and P13 also echoed the same experiences when it came to learners receiving information based on lessons via technological devices. They noted*

*My experience is that, when learners are at home, it can be a little problematic especially if they don’t have Wi-Fi. They don’t have enough data to download documents or presentations so the information doesn’t reach everyone (P6); and*

*I have experienced the use of technology as being hindered because of loadshedding, and learners who don’t have devices at home. I have found it difficult and so have the learners (P13).*

The participants’ words indicate that regardless of the technology in the classroom, many learners may face challenges once the work moves to their homes. Some may not possess such devices at home, and some may not know how it works if they have limited access to it. To overcome such challenges experienced by teachers, they often resort to textbooks and

worksheets as easier methods to get the work done. Like P13, P7 also mentioned problems of “loadshedding”, but also added experiencing “malfunctions or the devices becoming corrupted and poor connectivity.” P8 pointed out that, because classrooms were not set up for devices, teachers experienced barriers trying to “set up the technology in the classroom”.

In Q3 of the focus group, the participants continued the discussion of their experiences. P7, 9, 10, 11, 15, 16 and 17 reiterated previous sentiments, noting that what they experienced to work well was the positive responses received from the learners, how interactive and innovative lessons were, and how the classroom atmosphere changed positively, with learners being more attentive, excited and interested. The participants noted that “The learners pay more attention to visuals because some learners fall behind when you discuss verbally, so when they are watching something, I feel they retain more” (P10); and “I experienced that whenever I come in with certain technologies to use on that day, the learners are very excited, attentive, and they want to listen to everything that you have to say or offer in that lesson” (P15).

However, there were also negative experiences as well. P7, 9, 10 and 11 shared that they experienced “a lack of resources” (P7); “technology that time-consuming to set up” (P9); and “having to use my personal laptop in a class that is huge, where the learners at the back only watch the visuals because there aren’t speakers to use” (P10). As was indicated in previous data generation methods, teachers again reinforced the issues of loadshedding, lack of resources and large classes (P11). The problems noted by P16 and P17 were based on the learners getting too excited and thus creating a disruptive atmosphere in the classroom. “I experienced the learners getting overly excited which is useless because they miss out on learning points I’m trying to teach them.” (P16). P17 also shared a similar response noting, “they (learners) love to watch documentaries on sections I’ve taught, but they get too excited, they make noise, they laugh and talk by saying: ‘did you see that?’ or ‘did you see that scene earlier?’ and in doing so they end up disturbing the whole class.” This was a clear indication from certain teachers that learners displayed excitement when a new method of teaching was used in their classes. This is echoed in the 2017 study of Eickelman and Vennemann, which emphasised how learners were constantly engaged with the new technology and teachers noticed significant improvement and understanding. However, the Eickelman and Vennemann (2017) study did not highlight the disruptive effects of technology use in the classroom. It was evident that, while learners being excited in a class ought to be encouraged and channelled into creative responses, the teachers recognised these as challenges.

In Q5 of the individual interviews, the participants were asked to explain their experiences (both good and bad) of using technology in your English classrooms. The participants shared positive and negative experiences in their classrooms based on the teachers' and learners' attitudes and prior experiences of it. The participants explained how they experienced the benefits of technology in terms of teacher-learner engagement and classroom interaction.

In the individual interview, participants pointed out the learners' positive experiences of technology use in the English classroom and a teacher noted that, "*Discussions become more interactive with learners, and I feel that more time is spent with learners now that you don't waste time writing on the chalkboard*" (P7). The increased interaction and the interactive nature of teaching and learning English became evident. Other teachers pointed to the role of visuals and visual literacy in the English classroom. They said,

*Learners were enthusiastic, interested, engaging, and it really was a fun lesson. If I could do all my visual literacy lessons using technology, that would be great. It helps learners work better with visuals and helps artistic learners who have a lower competency level in terms of reading and written work. Visuals help learners see the emotion of it* (P1);

*The use of technology in the English classroom has had a huge positive impact on the teaching and learning process as learners enjoy visuals and they are learning in a fun and enjoyable way* (P5);

*The good part of it is that you are reaching the learners who have difficulty in actually reading a text by providing a visual stimulation to the learners, for example the visual aid and technology that assists in projecting a particular text like Hamlet or The Picture of Dorian Gray* (P6); and

*What works well for me is I was able to show the learners snippets of the movie, Tsotsi, so that they could visually identify the intensity of certain themes in the novel, like violence or gangsterism, which I think creates a more contextual learning space.* (P8)

Teachers' explanations of their experiences emanate from their learners' responses to the use of technology. When learners are enjoying a lesson and are actively involved, teachers, too, feel motivated by the experience. The visuals also help learners who think more visually and help them understand.

P8 also explained the effective use of technology to teach writing. P8 noted that technology was used to

*show learners examples of good writing. I find that with the chalkboard that is impossible and also with worksheets, it's very time-consuming, so showing them an example of how to write a good essay and what is a bad essay through a projector is very effective and that worked really well in my class. Also, it reduces the strain on me in terms of running out worksheets. It's also good to teach how to do mind maps and take notes. The chalkboard is not big enough to draw a proper mind map, but by using a projector, mind maps become very effective especially when characterising characters in the novels and set books we study.*

P8 recognised the drawbacks to spending time writing on the chalkboard and understood the value of learners seeing what was being explained. Learners are embedded in a visual culture through television, gaming, and social media, so being taught through this medium becomes very effective. P13 also explained the experiences of using technology by saying, *“the results speak volumes, learners literally understand better, especially when it comes to literature. Usually, they don't or can't understand the language that is being used in the literary text so it gives them the opportunity to understand it better and better explain their answers when asked questions.”* It is evident from the responses from P13 point to a strong understanding of how technology supports understanding, especially in understanding language that might be difficult to comprehend.

In the focus groups, similar responses were evident. They noted that *“For me it is the learners' reaction to it. They enjoy the lessons more and get more out of the lesson when we make use of technology compared to the chalk and talk. So the reaction and the experience I have with them is different and that's positive.”* (P9); and *“The good experience that I have when using technology is seeing the learners faces light up when they see technology being used in the classroom. When we use a projector, which is not too often, they are very excited and they are very eager to learn”* (P11). Again, like in the individual interviews, the teachers' responses were largely based on learners' reactions to the devices, which enhanced their lessons. Even if learners were not frequently introduced to technology in their classrooms, when they were, there was a more positive and interactive learning environment. P15, 16 and 17 supported these views, noting that *“I've observed that the learners perform rather better in those aspects that were taught using some kind of technology because I think they have the vision in their heads”* (P15); *“I have a good experience with using audio clips to conduct my listening comprehension*

*lesson. Learners were excited and they were engaging” (P16); and “The good experience is that my learners really enjoyed watching Romeo and Juliet and they even make references to scenes, which was good and positive” (P17). The responses point to the importance of drawing on learners’ visual and aural learning styles. Learners were able to understand the content of the lesson better when listening and watching content related to their lesson and were able to be more interactive and provide more valuable feedback. This was of benefit to the teacher.*

However, these participants also shared their negative experiences of using technology in their English classrooms. P7 stated *“The Media centre needs to be booked and moving to the Media centre takes up a lot of time and lesson time is lost.”* As for previous data generation methods, teachers pointed to the need to use personal laptops without big screens, and using laptops without adequate sound (P10, P16, P17). P9 explained that, due to the lack of available devices at the school, technology use is not consistent and it does not happen as often as it should, where as a result, a lack of resources becomes the barrier. P11 described further technological barriers by saying that *“we are faced with many barriers for example, when we have to use technology, the lack of reliable Wi-Fi is an issue so, when using YouTube to teach something and we have the video buffering continuously, that’s when we lose the learners’ attention.”* P11 noted that, at times, and due to the poor connection he gets in his class, he has to use his cellphone to hotspot.

The participants of this study noted that they were largely comfortable when using technology, learners were enthusiastic and found the lessons interesting when they used visuals, but some were easily distracted and were disruptive and noisy. The participants stated that technology use in their English classrooms saved time, and they were able to have more interactive lessons. Similarly, Coklar and Yurdakul’s (2017) study found that, when technology is used in the classroom, it increases learner interest, as they are attracted to the visual content as many learners are visual and aural, and this helps to develop the lessons actively and improved retention.

However, the participants noted that, due to the lack of resources, technology use could not be consistent in the classroom as devices were limited in a class and it was not practical to use their own devices due to the large number of learners in the classroom. Loadshedding and poor connection were also other contributing factors noted by these teachers. The findings cited echo those of Ortega and Fuentes (2015), who found that teachers’ experiences are shaped by the availability of suitable resources, and the time required to set up devices which results in limited

teaching time. This relates to the study by Stover et al. (2015), who claim that, even though technology in the classroom provides an interactive approach between the teacher and learner, it is important to note that many schools around the world do not have or have limited access to technology in their classrooms, and therefore, that experiences and uses for these teachers will be poor. As a result, despite teachers finding technology to be beneficial, the lack of resources creates a negative experience, which results in teachers rarely using these devices. Even though these devices were working well for some participants in the study and benefited learners, it was noted that this was not a consistent method of teaching and this could not provide continuous value and progress to learners and the teacher. According to Hixon and Buckenmeyer (2009), in order for technology to work successfully, it is important that these challenges faced by teachers are overcome.

The findings indicate that teachers' past experiences (whether positive or negative) would decide their technology use in the future. Similarly, the theory of experience indicates that past experiences would shape present and future experiences. Dewey's ideas indicate that growth is tied to experience and experience is the vehicle for growth that enhances potential for further learning and development, and in order for an experience to result in growth, it must meet the dual criteria of continuity and interaction. Experiences will depend on past, current and future experiences, and continuity will be based on how these experiences have impacted the individual. In the research study, the experiences of the participants were both good and bad, however, due to the limited resources that teachers have in their classrooms, there is reduced use of technology in their English lessons. Ultimately, teachers will make pedagogical decisions based on their attitudes to technology and their experiences of technology.

### **5.3.3. Theme 3: High School English Teachers' Attitudes and Experiences of Technology and the way in which they Shape their Pedagogical Decisions**

A study conducted by researchers McCulloch et al. (2018) found that teachers' attitudes about and experiences of teaching and learning impact their behaviour and teaching pedagogies in the classroom.

The data from the three data generation methods indicate that the participants' pedagogical experiences and attitudes toward technology affect their utilisation of technology in teaching. This means that teachers will bring their previous experiences with technology into the classroom, along with their knowledge, skills, and attitudes, which will determine their use of

technology as part of their pedagogy. These previous experiences of and attitudes to technology will determine whether technology features in their pedagogical decisions.

In terms of pedagogical choices, it was important to establish what forms of technology were available for teachers and learners to use. Eight participants stated that their schools had access to technological devices at their E-Learning centres which needed to be booked. P4 noted that *“Tablets are available for use by learners in the E-Learning centre. Laptops and projectors are available for use by educators via booking.”* The participants shared that laptops were provided to each department, but these had to be booked in advance, projectors were available in selected rooms, and the E-learning centres (also referred to as the ICT Room) had devices such as smart boards, projectors, tablets and computers available to book, which could lead to scheduling conflicts. The participants noted that technology use as pedagogy was supported in their schools. P11 stated that, *“Technology is supported to a certain extent as my school would like for us to start progressing towards the use of technology in our lessons. However, due to financial reasons it is hard but they are currently seeking sponsorships”*. P14 also stated that the school is in full support of technology use in teaching and learning, however it is only available to one room. P14 noted that *“the school’s and principal’s approach is for the age of technology. However, the necessary devices such as tablets and projectors are restricted to certain rooms.”* Similarly, P1 noted that, *“We have limited technology implementation.”* This indicates that schools and principals perceive the usefulness of technology use for teaching and learning in theory, but in practice, it is not possible at all times.

P5, 10, 11 and 14 also point to a lack of resources, saying *“At the present moment, there are no resources available. There are many teachers in the department and it is challenging to share one laptop and projector”* (P5); *“Technology implementation is limited due to financial constraints and it is very difficult to secure sponsorships”* (P10); *“Technology implementation is supported to a certain extent. Due to financial reasons, it is hard but they are currently seeking out sponsorships”* (P11); and *“devices such as tablets and the OHP are restricted to certain rooms and gathering learners is a bit time consuming. In addition, Wi-Fi is not received in all classrooms”* (P14). It becomes clear that pedagogical decisions are based not just on attitudes and past experiences, but on current financial realities in schools and classrooms.

P2 shared another view. P2 noted that, *“We do have internet access and the use of projectors, but it is difficult to actually create the time to utilise these facilities. I find it easier to just cascade this information to the learners via our class WhatsApp group for learners to view at*

*their leisure for exam purposes.*” These words indicate that, despite having these devices, the participant found it difficult to create time within the lessons to make use of them.

Answers in the open-ended questionnaire supported teachers’ answers in other data generating methods. Issues covered in the questionnaire included the technology available in schools (projectors, laptops, computers, tablets, screens, Wi-Fi, internet access to log on to YouTube), the limited availability of such resources, and the need for sponsorships in order to uplift their implementation of these devices in their English lessons. Crompton (2013) notes that although technology integration is perceived to be useful and advantageous, it may not necessarily be possible for all teachers due to a lack of technology integration. Theoretically, the change in pedagogy for teachers is ideal, but in practice, the opportunities offered are limited and this determines teachers’ attitude toward integration (Zheng & Huang, 2014). In terms of the TAM model, teachers’ attitudes are determined based on their ease of use when integrating technology and in the case of the participants, they each face some challenge or the other.

In terms of actual technology use in English lessons, in Q5 of the open-ended questionnaire, participants were asked to state the aspects in English for which they use technology. All 14 participants stated that technology was used mainly for literature lessons as well as for other aspects of English such as language, writing skills, advertising and cartoons, and oral presentations. P5 stated, *“Literature, especially poetry. Learning about the poet’s background and a visual analysis helps learners follow easily, breaking away from the monotony of the teacher explaining line by line.”* P10 also shared a similar response, noting *“I use technology to teach set books as I can play the movie version of a novel which allows learners to retain information better as many are visual learners. PowerPoint presentations are used to explain poetry, and the background and characters.”* However, P8 mentioned that, while literature is often taught using technology, he also integrated technology into other lessons. P8 noted, *“I use technology for all aspects of English. Whilst literature, such as novels, plays and poems are popular aspects, I found that language aspects and creative writing skills worked really well on projected PowerPoints and other creative ways to teach such skills.”* These participants found technology to work well in aspects of literature, mainly poetry, novels, and plays, which helped aid the understanding for learners when it came to understanding the contexts of these texts. It was also mentioned that learners retained information better when technology was used to teach literature lessons and teachers found the learners to be more engaged as compared to using more traditional methods of teaching literature. Based on the findings from the open-

ended questionnaire, all 14 participants shared similar understandings of technology use in their English classrooms.

The individual interviews provided further information on how English teachers use technology in their English classrooms. As stated by some of the participants: *“I have used my cellphone and my laptop to conduct lessons using YouTube videos to teach aspects of language such as adjectives, idioms and songs that were chosen for my learners’ levels”* (P5); *“We have used PowerPoints, videos, and oral presentations that learners incorporate as visual aids. I’ve utilised cellphones and WhatsApp chats for sharing documents and voice notes with learners.”* (P6). Many participants also used technology for oral presentations, where P1 indicated devices used was slideshow and videos demonstrating to learners what advertising and visual literacy are, and P1 used visual elements to explain the advertising principles, such that learners could understand better. In the focus group, many responses from previous data generating methods were reiterated. However, they also included the use of the radio for listening comprehensions.

In Q6 of the open-ended questionnaire, the participants were asked, in an ideal situation, how technology would be used in the English classroom in order to optimise teaching and learning. Each participant stated that they would use a device for various elements of English such as literature, poetry, drama and writing skills to identify spelling and grammatical errors, to show how summary writing is done, or even to teach language aspects to show the link, for example, between language and advertisements or cartoons. P3 stated that, in an ideal situation, learners would be shown visuals of what was in a text and short clips of the movie for literature to explain certain parts to a novel, play or poem. P4 stated that ideally *“activities for learners should be uploaded on a portal”* for easier access and reference to what was taught in that particular lesson. P5 further added, *“I would use videos to teach certain aspects of language and poetry and also song lyrics to teach certain aspects of language. I would also like learners to use tablets and introduce games in small groups to teach language aspects such as adjectives, nouns etc.”* P8 noted that, *“It is reinvigorating for me just to think about an ideal situation in which I can use technology. There are so many ways that I can implement technology - PowerPoints, visual literacy activities, songs, and showing learners what a good essay looks like versus badly written essays. Learners do not see the value of worksheets anymore. They throw them away. In an ideal world, learners can research in class and watch videos of lessons instead of listening to me all the time”* (P8). P11 stated that *“My ideal situation would be to be able to teach using a smartboard, as you are able to play videos, show*

*PowerPoints, play informative and educational games.” and P14 shared, “Ideally, I would use technology in the introduction of my lessons, as learners now get to put a visual element to the text. It can lead to a more captivating and attention grabbing lesson for the learners.”*

These participants have all stated in their responses how any form of technology can ideally enhance their lessons as well as their learners’ learning experiences. Therefore, it is evident that teachers were fully aware of the benefits technology brings to the lessons and ideally would want to have such devices in their English classrooms to help aid in the lessons conducted. By allowing them to share, they were able to imagine enhanced pedagogies and recognised how teachers and learners would benefit.

The participants were asked to explain, in Q8 of the open-ended questionnaire, how they as teachers teaching English in the 21<sup>st</sup> century, were providing the knowledge, skills and values to learners so that they would be able to leave school with the requirements to succeed outside school. All participants believed that their learners should be able to take away life lessons, morals and values, as well as a skill that can be used in their careers, especially where technology was involved. The responses from the participants were as follows: P1 noted,

*I have instilled in learners that when they leave my class, they must take away three things: 1. learn something about life; 2. learn something about the world; 3. learn a skill in English, so that when they are out in the world living life, they will communicate well in English.*

P2 stated,

*I teach my learners how to communicate. I also attempt to instil morals and values via messages and lessons learned from the literary texts. I also encourage learners to utilise technology in their oral presentations.*

P3 noted,

*Teaching them literature, it’s a mirror to their lives - the morals, values in texts. Formats for letter writing and emails help them in the real work world, speech skills to speak on public platforms, and language aspects to enable them to construct proper sentences when speaking and writing.*

P6 shared,

*I engage with learners on various platforms. I ensure that they have the ability to critically engage in meaningful conversations and present themselves responsibly.*

P9 stated,

*I encourage creativity, because I think it is important in life. Critical thinking is a skill that is required for life and I always try to develop it in learners. Communication skills are essential, because learners must be able to express themselves accordingly.*

From these responses, it is evident that a teacher's role in the classroom is not just to deliver the content of the lesson as per a textbook, but to also ensure that when learners leave their classrooms, they are not just taking away the knowledge of the lesson, but the skills which they can use outside of the classroom and which will be of benefit to them. While the participants previously expressed the importance of learners having knowledge about technology and how to use it, in this question, the focus was not explicitly on technology, but on other important skills. These skills included communication and speech skills, inculcation of morals and values, and the importance of creative and critical thinking. Thus, while technology was recognised as beneficial to learners, it was just one form of knowledge and skill among many other forms of knowledge, skills and values.

In Q9 of the open-ended questionnaire, participants were asked to share how the many forms of technology (resources) that learners have access to are capitalised on in their English classrooms. Each participant stated that technology had helped in many ways by allowing learners to connect with each other, work with each other interactively, engage with the topic and texts for discussion, and share work and resources amongst learners. P1 and P2 stated that technology as a resource helped the learners to understand, peer teach, as well as interact effectively. Learners are also required to utilise technology in their oral and group presentations in the classroom as reference to their piece of work, which created a highly interactive and engaging environment (P2). P3 however, stated that learners are not just allowed to use technology when they want to but strictly when they need to do some sort of research. P5, 6, 7, 8, 9 also stated that technology as a resource was useful for sharing information amongst learners on chat groups, *"I have created a learner group on WhatsApp to share resources and interact with learners during the holidays to assist with remediation and enrichment. Learners appreciate this and there has been an improvement in lessons being more learner-centred."* (P5). P9 also shared that learners were allowed to complete their homework and send it to her

via WhatsApp, because this makes it easier to identify their mistakes and then rectify them. P9 also stated that “ *I used it as a communication tool to assist them with additional work should they require it. I also use WhatsApp for reminders about assessments and other important dates.*” Each participant emphasised that on the chat groups they have created for their subjects and grades, vital information and notes are sent to learners to read through and complete if it is not completed at school. It also allows for interaction to take place and learners can gain clarity on any aspects that are confusing and teachers have the opportunity to respond with clarification to their learners. It is very clear that teachers utilise WhatsApp groups most often and appear to capitalise on the benefits of a WhatsApp group to enable communication and clarification.

In Q11 of the open-ended questionnaire, the participants were asked for their views on NOTICE 752 of 2010: Department of Basic Education (DBE) ‘Action Plan to 2014: Towards the Realisation of Schooling 2025’, where one of the 13 Goals is “to Increase access amongst learners to a wide range of media, including computers, which enrich their education”. All participants stated that technology integration in schools to enrich education amongst learners is an excellent idea, noting that it is vital for technology to be a part of the curriculum, and it will benefit future generations. However, as positive as these participants were towards the proposed goal by the DBE, many of them were also doubtful as the government has not many schools to date have devices to hand. Most of the devices at these schools have been through sponsorships, so teachers were not hopeful that this goal would be implemented. The responses shared by the participants were as follows: P2 states that, “*I view this as a far-fetched goal due to the financial constraints being experienced by the Dept. of Education. Security at schools is also a serious challenge, with computers being stolen, Wi-Fi signals not reliable; hence my decision to cascade information to learners via WhatsApp from my home as almost all senior learners have access to cellphones. Perhaps the Dept. of Education should be utilising this form of technology as most learners have cellphones.*” P3 believed that this was not practical especially for public schools, noting, “*That would be ideal in a private or model C school, but for a public, fee-paying school, it’s not practical. If the department provides this for every learner, teaching and learning would be great. Until this happens, traditional teaching and learning would continue.*” P5 noted that “*It is an excellent idea on paper. Implementing this idea at schools may be a challenge. Learners have a lack of respect for school property given the pathetic conditions of textbooks at the end of the year. Vandalism and irresponsibility is second nature to many learners at our school. Despite having a fully equipped E-Learning*

centre at the school, it has not enriched learning. No amount of innovative learning and teaching can change the mind set of learners that lack inclination and motivation to learn.” P8 stated, “I would really love for this goal to be achieved but by 2025? As time goes by, the vision of implementing technology goes further away from our grasp due to other issues that arise such as overcrowded classrooms, corruption in the system, and issues of energy that seem to worsen. On paper it seems noble, but in reality it seems that the people in power like to keep our children in poverty.” P9 believes that this is a beneficial initiative, but also has her concerns, noting “Wonderful initiative. If learners and teachers had access to online learning during COVID-19, then teaching could still have taken place. However, that was not the case in the majority of the schools. The DBE has often made promises like these or set goals such as these but often failed to deliver. I would love if this goal was achieved, however I doubt it will.” P11 stated, “I do share the same sentiments as we are living in the 21<sup>st</sup> century and the 4<sup>th</sup> Industrial Revolution (4IR) is eminent, however, the cycle of poverty and lack of infrastructure hinders this idea and progress of achieving this long term goal.” These responses from the participants all related to one another. Many are in favour of this vision and goal by the DBE but have very little faith this will come to pass for future generations, as economic oppression remains widespread. The responses indicate that teachers are very aware of the realities of their situations. They are also aware of many unfulfilled promises in the past. Overall, they do not appear to be optimistic that technology integration in its fullest form will be realised in the near future.

In Q10 of the individual interviews, the participants were asked to share their opinion of what would be the ideal way that technology could be integrated into English classrooms to support teaching and learning. Each participant wanted to embrace technology, which meant that each teacher wanted to have technological devices in their classrooms, so that not only would they have the theoretical knowledge to learn, but also the skills that go hand-in-hand with it. The participants also felt that technology would aid in better performance for learners, teachers’ paperwork would lessen, and they would be able to keep up with educational and technological advancements. The responses were as follows: P1: “In the future, as English teachers, we would like more screens, projectors, laptops, iPads so that learners are able to source material for their work, use resources as materials from different sources and learners could actually use technology in the classroom to get a better understanding of the English language.” P5 noted that “The ideal would be for teachers to become equipped with the necessary skills needed to incorporate technology in the classroom. I think professional development should be

*an ongoing thing for teachers and every classroom should be equipped with a projector, laptop, speaker, Wi-Fi or fibre connection to enhance teaching and learning and learners should also be given an opportunity to use tablets in the classroom and have online activities to engage in, as we are all trying to move away from worksheets and activity books. Going paperless in this day and age is one of the ways to minimise learners from leaving textbooks at home, so I think technology would definitely have a huge impact on learners in a positive way in the classroom".* P7 also shared a similar view, noting that technology needs to be present in a teacher's classroom and a classroom climate must be created where technology is integrated into lessons and further added that, *"English lessons would become more interactive and instead of making learners only read novels, they can also watch the movies based on these books and plays in class to reinforce what the novel is about. Also policymakers need to ensure that every school has some sort of technological device installed in all classrooms."* P6 noted that, *"I would say the first point is access for every educator to PowerPoint presentations and also having proper networking systems at the school, having access to Wi-Fi in every classroom for the teachers so they are able to search for resources, and YouTube videos on particular sections in English. So if you are teaching a particular section in English like how to conduct an interview, you can show the learners visually how it is done instead of depending only on theoretical knowledge. So when they are being tested on it, they remember visually how a particular aspect is done and can apply this to their work. Technology just enhances everything."* P6 also stated that when learners watch videos of, for example, a language aspect, or writing skills, such as how to write an interview, technology helps them to visualise the principles being taught. P8 also explained how vital it is for teachers to be equipped with the necessary tools such as a projector, computer, whiteboard or a laptop to conduct lessons, as that is the way forward with many other countries around the world. He also went on to say that, *"I think that as a developing country and a developing schooling system, we really fall short of where we should be and that hampers our performance in class."* P12 believed that technology must definitely be implemented and integrated in English classrooms, and schools need to embrace the 4IR so that learners, who are technological savvy, will be able to embrace this new method of learning with more understanding of the topics being taught.

In the focus-group interview, the participants echoed many of their sentiments in the questionnaire. P7 stated that support needed to come from the Department of Basic Education, so that resources may be provided to schools. Likewise, schools need to encourage the use of technology so that teachers can be technologically informed, and practice the use of technology

in their lessons, which would result in better teaching and learning. Participants 9, 10 and 11 stated that school managements needed to play a very pivotal role in ensuring that technology was being used by teachers. P9 explained, *“I would say that the management needs to encourage the proper use of technology in our classrooms/school. They need to try to secure sponsorships for technological devices as well. They have to fill in the relevant forms, they have to attend workshops, they have to send teachers for training. So I know for a fact that management puts a lot of effort and a lot of time into trying to advance schools with technology and although it does not always work out, I do feel that they do support it 100%, and they would like for us to use it more in the classroom. They do try to make it available and try to get the necessary resources for it.”* P10 also shared the same belief when it came to the support of the management at the school. He also added how both the school and community play an active role in trying to secure sponsorships to help benefit both the teacher and learners. P11 explained that, *“Management encourages technology in the classroom just as we do. They also know that learners retain information better through visuals.”* P11 also added that despite the school securing a sponsorship for a different subject, was hopeful that they would also receive a sponsorship for their English Department. P15 added to P7’s responded that the Department of Basic Education needed to provide these resources to schools, so that there are enough resources for all. P15 further added that teachers need to be trained in order to carry out their jobs well and utilise these resources effectively. P13 also added that, while an E-Learning centre is available at the school, tablets are not being used by the learners, which defeats the purpose of even having such devices. P13 mentioned that there are not enough tablets to cater for an entire class.

From the responses received from the focus-group participants, it is evident that technology plays a vital role, but that it depends on the availability of resources to the schools, and the support received from the Department of Basic Education and school management. The participants in this interview clearly stated that support is received by teachers from their management, but also needed support of complete suitable resources by the government, as well as teacher training, so as to aid better instruction and delivering of lessons. Aligned with this study, Tondeur et al. (2017) found that there is a close relationship between teachers' experiences and attitudes, and their pedagogical decisions when it comes to the use of technology, if teachers are given appropriate access to technology. In the current study, teachers had a positive attitude to the use of technology in their English classrooms, and were able to perceive its usefulness. However, the limited resources were a challenge to them, and

thus there was not a perceived ease of use of technology. This is of concern for pedagogical decisions and thus, for teaching and learning.

As technology is advancing, teachers need to familiarise themselves with and use the various types of technological devices available, which help acquire the pedagogical possibilities through technology (Dong & Newman, 2018). Dong and Newman (2018) add that teachers have to be willing to constantly develop their pedagogies when it comes to technology, due to the developments occurring regularly. The teachers in this study explained that they were willing to integrate technology into their teaching pedagogies, especially with learners being technologically savvy, and for that reason, ongoing teacher development is imperative. A study by Prestridge (2014) argues that, even though teachers are faced with many barriers to teaching using technology in their classroom and the school context, it is important that they overcome these barriers and become the agents of change, especially in a rapidly changing world. In this study, we are able to understand how the teachers, despite having limited devices and other technologies, are able to utilise their own devices in their classrooms to try and deliver their best possible lessons.

The participants were asked in Q7 of the open-ended questionnaire to share how their views on technology use supported and complemented English lessons, as compared to more traditional ways of teaching English. From the 14 participants, only two stated that technology integration takes away the value of lessons where learners need to learn critical and analytical skills which cannot be taught with technology alone. P3 explained in her questionnaire that, *“Nothing beats using a hardcopy of the text when reading, teaching and studying. Asking learners to download and read doesn’t work - poor families, no data, but they would read worksheets given.”*, and P5 notes that *“English requires more traditional methods of development of critical skills and analytical minds.”* What the two teachers are indicating is that they are convinced in the success of print and traditional methods to teach skills needed in an English lesson. While P3 points to economic reasons, P3 still emphasises the need for a *hardcopy* to teach English skills. P5 appears to equate *critical skills and analytical minds* with *traditional methods*. As these responses were written in a questionnaire, it was not possible to ask follow up questions as to how such ideas might be implemented in practical terms.

Another factor noted was that learners at many public schools may not be technological savvy as they do not have access to certain devices. Five participants explained that both technology and traditional methods ought to work hand-in-hand, as they are equally imperative and of

benefit to both teachers and learners. P5 stated that technology creates an opportunity for different strategies and methodologies to be introduced whilst also working with traditional methods. P8 also explained,

*I think technology should complement traditional ways of teaching English by integrating worksheets, chalkboards and textbooks. Different stages of the lesson can implement different resources to enhance learners' overall English skills, whilst technology keeps learners attentive and engaged in the lesson. Technology does not solve all literacy problems, but it is an important feature that could improve the poor performances of the majority of learners today. In view of the vast financial and social inequalities among learners, a complete technological revolution in schools is not practical. I feel there has to be a balance.*

P12 and 13 also explained that both methods of teaching are necessary as one cannot exist without the other. P12 stated, “*You need to talk through a power-point presentation and a learner cannot understand by just viewing, they need a book to write down and make reference to.*” Seven participants (P2, 4, 7, 9, 10, 11, 14) explained that the use of technology is beneficial and improves the teaching and learning process.

However, P7 stated that technology is “*faster, easier, less complicated and there is better engagement with learners as it allows them to have access to what they need and when they need it as opposed to traditional ways of teaching.*” P10 noted that technology is “*modern and it is something learners prefer, because they are connected to the modern world.*” P10 also added that learners tend to be “*active in the lesson, disciplined and retain information faster.*” P11 stated that,

*Traditional methods are mundane and outdated as it only gives learners one perspective. Whereas, if you show them videos and allow them to search using the internet during a lesson, they are exposed to a variety of perspectives and learners tend to be more interactive in the lesson and feel motivated to ask questions during the lesson.*

Similarly, P14 noted that “*we are now in the 4IR and it is necessary as teachers to expose learners to technology at an early age so this can be of great benefit to them*”. Lastly, P9 explained how technology is a “*great teacher tool and improves learners' ability to understand concepts as learners tend to also like the technology more than traditional forms of teaching.*” The sentiments cited above indicate the participants' attitudes towards and experiences of

technology and traditional methods of teaching. However, it becomes clear that the majority of the participating teachers believed that technology plays a significant role in the English classroom for both teachers and learners.

In Q9 of the individual interviews, the participants were asked to explain to what extent they shaped their English lessons to include technology. From the six participants, two stated that they use very limited or minimal use of technology in their classroom English lessons. P1 stated, “*I do use technology, however, I do not engage my class in it 100%, so basically I use technological devices for my lessons but the learners do not get the full use of it, unfortunately*”, and P6 explained that

*It isn't to a large extent, but I do use it to a limited extent to enhance what I am doing. I think it is because of the subject content, but I do encourage it in my oral lessons in terms of learners doing oral presentations and teaching them how to use a visual aid because using a visual aid has become a compulsory component of English home language. So encouraging them how to use a visual aid is vital. It's not just putting up a presentation or a video with the projector and laptop and then delivering your speech, but making regular reference to the presentation. But I don't rely on technology heavily as a starting point in my lessons, but more as a summary of what I'm teaching.*

P1 and P6 state that technology does enhance the lessons, but only to a certain extent, as they are not reliant on technology for their entire lesson, but only during certain parts of the lesson. However, participants 5, 7, 8 and 12 stated that technology is used in their lessons for purposes such as language and literature. P5 explained how she wished that, during her own schooling, technology was an option for her to learn in such a manner that her performance could be better at school. P5 further stated that,

*Textbooks alone cannot equip us for the real world because theory goes hand-in-hand with practicals, and I want to be a better teacher for my learners; so by upgrading my skills and bringing in new strategies into the classroom, it would ignite interest in the subject and the learning in all learning areas. My lessons are structured in a way to incorporate different strategies for teaching a particular lesson using different technological devices.*

P7 indicated that “*I use technology to shape my lessons in language and literature to create a visual, audible and realistic lesson, to help learners be a part of it and to bring about group work as well as show them slideshows*” and P12 stated,

*Literature is one of the biggest sections that I do use it for. But also in our language lessons, for different parts of speech, understanding words, and how to construct sentences. It helps using technology because it’s not just a teacher standing in front and teaching a lesson, it literally shows you how these words are constructed and YouTube has a plethora of different ideas on how to do it so using technology definitely helps our learners.*

The teachers cited above recognised the benefits, in real terms, of technology integration into their pedagogical decisions. P5 aligned technology integration to pedagogy and to becoming a better teacher. Similarly, the other two teachers cited pointed to drawbacks in traditional teaching and knew where and how to access effective technological resources to enhance their pedagogies.

However, P8, while indicating his previous effective use of technology, pointed to a personal contextual barrier to technology integration:

*I used to use movie clips of novels and Shakespeare – they were very popular. I think teaching Shakespeare using those YouTube lessons were very effective, so when I used to use technology, I used them to shape my lessons with integration of those clips and also some writing skills. But recently, I don’t really shape my lessons according to how I could use technology. I try not to do that, because I know technology is never going to happen fully in my class. There’s also another story about how my projector that I used got stolen, so I think that also shapes my attitude now towards using technology and using my personal funds to replace items. I feel that while it may be appreciated, it did not fit the context in which I teach because of the criminal elements that exist there. So yes, maybe technology would be good, but I think the context is a serious factor. So I don’t shape my lessons currently to include technology, instead I use existing traditional resources, like worksheets and the chalkboard. There’s not even a whiteboard to conduct my lessons.*

P8’s negative experience has shaped both his attitudes to technology and his pedagogical decisions. While he knows that technology is useful in a classroom, technology is not perceived

to be user-friendly in the context in which he works. He, therefore, reverted to his traditional ways of teaching. Thus, while teachers recognised the benefits of technology and had experienced positive lessons using it, their attitudes and pedagogical decisions were shaped by their past experiences of technology use and their current contextual conditions.

TAM and the theory of acceptance proved useful to understand teachers' attitudes to technology use, and the way in which their experiences decided their pedagogical decisions. This study also explains and confirms the findings of earlier studies (such as Wong, et al., 2010), who found that technology's perceived usefulness (PU) has both direct and indirect impacts on behavioural intention. Therefore, educators were more likely to use technology in their lessons if they believed it would be beneficial and a significant means to provide and enhance teaching and learning. In the current study, PU indicated how teachers experience technology usage in their English classrooms, and the contribution it makes to their lessons and whether or not continued usage will occur due to their attitudes based on it. It was evident that teachers' attitude towards technology was positive, but that they faced barriers with integrating technology so that also played a role in their behavioural intention. In other words, they lacked PEOU.

From the responses obtained from the data generation methods, in relation to the theory of experience, the interaction with technology also served as a way to interact with these devices within the context by testing them against traditional methods, and understanding their experiences as they actively constructed meanings. Through their experiences of interacting with technology, they were becoming agents of their own teaching methodologies, rather than passively absorbing the norm of teaching traditionally. When new teaching methods work well for teachers, they will most probably continue using the methods. Continuation then results in a favourable experience. However, if the opposite is true and experiences are negative, then interaction and continuation with new methods will stop.

#### **5.4. Conclusion**

This chapter has presented data generated from the participants using an open-ended questionnaire, individual and focus-group interviews. Themes were developed to explore the participants' understanding of technology, including their attitudes and experiences, and how such shape their pedagogical decisions. Each response was analysed and supported with the relevant literature and theoretical framework that underpinned this study.

From the findings in the data, it is evident that the participants had a positive attitude towards the use of technology, but also faced contextual barriers in their classrooms, which created a challenge when utilising technology. The majority of the teachers in this study had a positive attitude to technology and many had positive experiences with it. However, challenges to implementation were evident. The teachers also saw the benefits that came with technology in their classrooms amongst the learners, and overall teaching and learning, and the ways in which it enhanced their teaching pedagogies.

Chapter 6 summarises the findings, considers implications of the study, identifies limitations, and makes recommendations for future studies.

## CHAPTER 6

### SUMMARY, IMPLICATIONS AND CONCLUSION

#### 6.1. Introduction

In this study, the main aim was to understand high school English teachers' attitudes and experiences when using technology in their English classrooms and to ascertain how, if at all, it shapes their pedagogical decisions. An interpretive paradigm, qualitative approach, and case study design was used to conduct the study, and three data generation methods, which were an open-ended questionnaire, individual interviews and focus group interviews were used to generate data. The study worked with 17 teacher participants at three participating schools. All participants shared their attitudes and experiences, including the opportunities and challenges they faced when using technology in their classrooms. Additionally, like the literature reviewed for the study, it was established that technology integration during teaching is influenced by several contextual factors.

This chapter summarises the main findings of the research study, in light of the research questions. Implications drawn from the study will be explored, limitations encountered will also be outlined, and finally, recommendations for future research will be suggested.

#### 6.2. Main Findings

Below are the main findings based on the research questions:

##### 6.2.1. High School English Teachers' Attitudes, with Reasons, to Technology Use in the English Classroom

The first research question sought to understand teachers' attitudes towards technology use in the English classroom. The study has shown that most of the participating teachers had a positive attitude towards technology use in the English classroom. The participants understood that technology was an effective tool in teaching and learning as it greatly enhances the lessons, making learners more actively engaged, and creating an interactive classroom atmosphere amongst both teachers and learners. The teachers also recognised that in a dynamic teaching and learning environment, it is imperative to keep up-to-date with the latest advancements to enable greater engagement and efficiency for teachers and learners who use it.

While teachers displayed a positive attitude towards technology, there were many contextual factors that influenced their attitudes towards implementing continuous usage of technology in their English classrooms. Such factors resulted from a lack of technological devices in their schools and classrooms, the lack of technical support should they experience difficulties in their lessons when using technology, the fact that it is time consuming to move from their classrooms to the designated media or e-learning centre to make use of some of the devices, and the challenge of sharing devices should multiple teachers want to use the room or devices at the same time. Thus, while teachers are generally positive about technology use and recognised its benefits, the challenging contextual factors often prevented its use.

### **6.2.2. High School English Teachers' Experiences, with Reasons, of Technology Use in the English Classroom**

The second research question sought to understand teachers' experiences of using technology in the English classroom. While some teachers had positive experiences, there were also many negative experiences of using technology in the English classroom. When using technology, the teachers experienced their learners being more engaged, and they experienced technology facilitating better learning. They also realised that it was a method of preparing learners for a more technologically advanced world. They further experienced a sense of confidence when delivering the lesson because they had the knowledge of technology, due to training received. The teachers also stated that when they used technology they experienced being more creative with their lessons by using methods they would not generally use with traditional methods.

However, the teachers also shared their negative experiences, which impacted their use of technology in their classrooms. Such experiences echoed their attitudes to technology brought about by a lack of facilities, the sharing of devices, and the time constraints associated with moving to get to the required venues and devices. The teachers also pointed out that they experienced uneven availability of resources, with some learners having devices and others who did not. Despite teachers being open to the idea of technology, and thus having a positive attitude towards technology integration into the lessons, the teachers felt that their experiences were largely negative, due to the many barriers faced.

### **6.2.3. How High School English Teachers' Attitudes and Experiences of Technology Shape their Pedagogical Decisions**

The third research question sought to understand how teachers' attitudes and experiences shape their pedagogical decisions. The data was clear that overall, teachers had a positive attitude

towards technology, and some teachers had positive experiences when integrating technology in their English classrooms. Teachers in this study were willing to integrate technology in their pedagogies as they were aware that of the enhanced learning opportunities it could provide to learners. The teachers also acknowledged that technology use would empower them and enable them to innovate their teaching practices and enhance engagement. However, the integration of technology in pedagogy depended on the availability of facilities and devices to allow for continued usage. Overall, despite understanding the benefits of technology to their pedagogical practices, more teachers chose tried and tested traditional methods over more modern methods involving technology. However, they did emphasise that if technology were integrated into their classrooms, they would engage fully with it.

### **6.3. Theoretical Implications**

This study was underpinned by the technology acceptance model (TAM) proposed by Davis (1986) and the theory of experience proposed by Dewey (1938).

TAM was useful in explaining and understanding the research questions based on teachers' attitudes to the use (ATU) of technology in their English classrooms and in their teaching pedagogies. The model and its key concepts, perceived usefulness (PU) and perceived ease of use (PEoU) were key determinants to explain their acceptance and adoption of technology (Venkatash & Davis, 2000), and were seen as the main determinants of the teachers' positive and negative attitudes towards technology in the English classroom. As per the model, teachers have perceived these devices in their classrooms as useful as a way to save time in certain aspects of English lessons and are aware that technology allows lessons to be visually engaging. However, the theoretical implications also explain why teachers have a low usage of technology in their classrooms due to the non-availability of devices in their classrooms and therefore, the perceived ease of use may not be experienced by teachers. In fact, technology use is challenging due to the various contextual barriers.

The findings from the research study indicates a strong correlation with the theory of experience by Dewey (1936). It is evident that learners benefitted from technological devices utilised in the classroom as they were actively engaged, which allowed them to construct their understanding of concepts and develop practical skills, which is central to Dewey's (1936) theory. However, the study also revealed that, despite technology being effective in promoting the teaching and learning outcomes, the participating teachers' experiences could be explained

by Dewey's (1936) ideas about interaction and continuity. Teachers explained that their interaction with technological devices was positive, because it helped to create a more interactive and engaging teaching and learning environment, but that their experiences did not positively impact continuity. While their interactions with technology positively impacted their pedagogy, the contextual barriers they faced led to their resorting to traditional methods of teaching as technology use was not ongoing and sustainable. Therefore, for technology to be used in the future, it has to be formalised in the education system, and schools need to be fully resourced to engage with it, or teachers will base their future experiences on past experiences, which indicate a lack of adaptation.

#### **6.4 Implications for Policy**

The implementation of technology in the English classroom can have several policy implications. In light of the study, it becomes clear that a number of important policy changes need to be made. These changes align with those of UNESCO (2013), and include:

- Infrastructure investment - If technology use in the English classroom becomes a requirement, then policies need to be enacted to ensure that schools have adequate infrastructure, such as internet access, computers, tablets, whiteboards, among others, to support technology integration.
- Teacher training - Policies should mandate continuing professional development for teachers to learn how to effectively integrate technology into their teaching practices.
- A digital literacy curriculum - If changes need to take place and technology is recognised as imperative in schools to prepare learners for a digitally modern world, then a curriculum that includes digital literacy skills is important so both teachers and learners are able to effectively navigate and utilise technological tools for teaching and learning.
- Accessibility - Policies by the Department of Basic Education should address the accessibility issues that schools face when it comes to technology integration and to ensure that schools have the access they need, so technology tools may be used by teachers and learners. Aligned with accessibility is equity. Warschauer (2003) emphasises that educational policies should aim to bridge the digital divide by ensuring equitable access of technology in all schools.
- Integration with pedagogy - Educational policies set out by the Department of Basic Education need to encourage the integration of technological tools in alignment with

pedagogical goals (Selwyn, 2011) rather than just using technology without preparing teachers and learners for a digital world.

Unless the government adapts to these changes regarding technology and finds methods to introduce its use, these goals regarding technology integration in schools and classrooms will not be attained.

### **6.5. Methodological Implications**

The use of the interpretive research paradigm proved effective in understanding the nature of the research topic which explored understandings of technology, attitudes, beliefs, experiences, and perceptions. This allowed for better meaning through the interaction of participants from the data generated. This provided insight and information on the attitudes and experiences of the teachers regarding the use of technology and addressed the research questions of the study which helped achieve the research objectives. The qualitative research approach helped to generate rich, in-depth data, in participants' own words, which helped to understand the attitudes and experiences of the teachers when implementing technology in their English classrooms. This helped the researcher to understand the challenges and benefits that were experienced by high school teachers of English. The case study research design helped the researcher to ask "how" and "why" questions and thus enable deep understanding of the issues being studied.

The issues of trustworthiness were supported by the sample methods used, which were well-suited to the research questions and objectives of the study. Credibility was ensured through combining the different sources of evidence, which helped enhance the study through cross-verifying the results and understanding the different perspectives of the participants. Transferability was enabled by providing detailed descriptions of the setting and participants so that the readers could make connections between this study and their own experiences. The study aimed to be transferable, so that it could be applied to other school contexts where other teachers or schools may have the same or even similar experiences of and attitudes to technology integration in their classrooms. Dependability was ensured throughout the study by ensuring that the research process was detailed and transparent when it came to the procedures involved between the researcher and participants. Confirmability was ensured through the data generation and analysis staying close to the participants' actual perspectives and experiences using their words.

## **6.6. Professional Practice Implications**

The evidence from the study suggests that there needs to be potential changes in policies, procedures, and practices. The goal with technology integration is to bridge the gap between research and practice. Therefore, it is important that teachers are provided with technology based training programmes to ensure that they have the necessary skills to utilise technology in their classrooms. While the CAPS document indicates that technology needs to be integrated in schools and lessons, there are experienced educators who have not received any form of training, which impacts their attitudes to technology. While curricular documents advocate for technology integration, the call becomes meaningless to some schools who do not have devices making resource allocation to educational institutions imperative. Schools need to have resources provided to them, while ensuring that there is equitable access to all teachers, learners and schools.

On a personal note, I know the benefits of technology integration and would like to use it more often. However, I also understand and experience the many challenges teachers are faced with regarding technology integration especially when schools are not able to provide resources. It is a task of the Department of Basic Education to ensure that equity is spread across all schools. Public schools and their learners can benefit significantly from technology.

## **6.7. Areas for Future Research**

There are many possibilities for future research and I highlight four of them. Firstly, the study focused mainly on teachers' attitudes and experiences of technology use in the English classroom. There is a need for an in-depth study of technology usage in the classroom by identifying the issues that arise as a results of technology implementation and integration in the classroom when teaching and learning takes place, especially in South African schools. Secondly, the study worked with three schools in the Verulam area, which were semi-resourced secondary schools. Further research is needed on larger samples and more schools, to provide insights into and understanding of technology use in the English classrooms amongst many more schools in other circuits and districts. Thirdly, research should be carried out in both urban and rural schools to gain a better and in-depth understanding of technology implementation across contexts. Finally, it may be useful to conduct research into technology acceptance based on teachers' years of experience to ascertain whether age and experience shape technology acceptance.

## **6.8. Conclusion**

In this study, the technology acceptance model (TAM) (Davis, 1986) and the theory of experience (Dewey, 1938) helped to understand and explain the participants' responses. The TAM was useful in understanding the likelihood of technology being adopted by the participating teachers in their context. The TAM constructs, perceived usefulness (PU) and perceived ease of use (PEOU) helped to explain the teachers' attitudes towards using technology which then predicted and explained their behavioural intention to use it. The behavioural intention to use technology predicted acceptance to use technology. Therefore, the TAM was useful to explore the participating teachers' attitudes towards technology use in the English classroom and to understand the factors that have led to this attitude.

To understand the participating teachers' experiences of technology in the English classroom, Dewey's (1925) theory proved useful. Dewey noted that growth is tied to experience, and experience is the vehicle for growth that enhances potential for further learning and development. Experience resulting in growth will depend on the relationship between a current experience and past and future ones, and an individual's interactions within the learning environment. Dewey's theory of experience helped to explain the interaction of teachers' experiences of and attitudes towards technology with their social and physical environments. It also helped to explain how the social and physical environments shaped the participating teachers' attitudes to and experiences of technology use in the classroom.

Ultimately, all participants fully understood the immense benefits of using technology to teach English, or any other subject. They noted the possibilities of technology transforming teaching and learning. In other words, they indicated a positive attitude towards technology. However, many participants also recognised the contextual barriers within their social and physical environments to using technology and identified negatives experiences of using technology. The participating teachers' positive and negative attitudes towards and experiences of technology use in the English Classroom shaped their pedagogical decisions about whether or not to use technology in the future. Thus, there is a strong positive attitude to technology, which is perceived to be useful, but there is equally an understanding, through past experiences and knowledge of their learning environments, that there is little ease of use of technology. Thus, the participating teachers' current experiences with technology will shape their future ones.

The Department of Basic Education (2010) notes that all teachers are obliged to use technology in their teaching and learning. As such, it is imperative that the Department implements and actions policies and programmes to equip teachers to use technology successfully and possibly revolutionise the education system to enable relevance. More importantly, schools need to have an adequate and equitable allocation of technological resources for teachers and learners. The nature of the 21<sup>st</sup> century learner demands that teachers integrate technology into pedagogic activities in order to prepare learners for the rapidly-advancing 21<sup>st</sup> century technological world.

## REFERENCES

- Abbit, J. (2011). Measuring technological pedagogical content knowledge in preservice teacher education: A Review of Current Methods and Instruments. *Journal of Research on Technology in Education*, 43(4), 281-300. <https://doi.org/10.1080/15391523.2011.10782574>
- Abdullah, F., & Ward, R. (2016). Developing a General Extended Technology Acceptance Model for E-Learning (GETAMEL) by analysing commonly used external factors. *Computers in Human Behaviour*, 56(1), 238-256. <https://doi.org/10.1016/j.chb.2015.11.036>
- Adnan, N., Nordin, S.M., B, Bahruddin., & Ali, M. (2017). How trust can drive forward the user acceptance to the technology? In-vehicle technology for autonomous vehicle. *Transportation research part: A policy and practice*, 118(1), 819-836. <https://doi.org/10.1016/j.tra.2018.10.019>
- Ahmad, J. (2012). English Language Teaching (ELT) and Integration of Media Technology. *Procedia Social and Behavioural Sciences*, 47(1), 924 -929. <https://doi.org/10.1016/j.sbspro.2012.06.758>
- Ahmadi, M. R. (2018). The Use of Technology in English Language Learning: A Literature Review. *International Journal of Research in English Education*, 3 (2), 115-125. <https://doi.org/10.29252/ijree.3.2.115>
- Albirini, A. (2006). Teachers' Attitudes toward Information and Communication Technologies: The Case of Syrian EFL Teachers. *Computers and Education*, 47(4), 373-393. <https://doi.org/10.1016/j.compedu.2004.10.013>
- Allen, M. (2017). *Communication Research Methods*. SAGE Publications.
- Almutwakki, A.Y., Ghurab, M.M., & Saeed, S.M. (2018). ICT Role in Yemen Basic Education and Awareness of Teachers. *International Journal of Innovative Science, Engineering and Technology*, 5(6), 33-45. <https://doi.org/10.1000/j.jas.2018.02.015>

Aslan, A., & Zhu, C. (2015). Pre-service Teachers' Perceptions of ICT Integration in Teacher Education in Turkey. *The Turkish Online Journal of Educational Technology*, 14(3), 97-110. <https://www.bit.ly/3bvgJ97>

Alsulami, S. (2016). The Effects of Technology on Learning English as a Foreign Language Among Female EFL Students at Effatt College: An Exploratory Study. *Studies in Literature and Language*, 12(4), 1-16. <https://doi.org/10.3968/7926>

Alvarado, L., Aragon, R.R., & Bretones, F.D. (2020). Teachers' Attitudes Towards the Introduction of ICT in Ecuadorian Public Schools. *TechTrends*, 64(3), 1-8. <https://doi.org/10.1007/s11528-020-00483-7>

Anderson, G.J. (1990). *Fundamentals of educational research*. Farmer Press Publications.

Anderson, B., & Ohlen, J. (2005). Being a hospice volunteer. *Palliative Medicine*, 19(8), 602-609. <https://doi.org/10.1191/0269216305pm1083oa>

Anderson, R.O., & Wu, T.Y. (2015). Technology-enhanced stem (science, technology, engineering, and mathematics) education. *Journal of Computers in Education*, 2(3), 245-249. <https://doi.org/10.1007/s40692-015-0041-2>

Anderson, T., & Rivera-Vargas, P. (2020). A Critical look at Educational Technology from a Distance Education Perspective. *Digital Education Review*, 37(1). <https://doi.org/10.1344/der.2020.37.208-229>

Arifah, A. (2014). *Study on the use of technology in ELT classrooms: Teachers' perspective*, (Master's Thesis), BRAC University, Bangladesh. Department of English and Humanities. <https://hdl.handle.net/10361/3999>

Arksey, H., & Knight, P.T. (1999). *Interviewing for Social Scientists*. Sage Publications. <https://doi.org/10.4135/9781849209335>

Arrow, K.J. (1962). *Economic Welfare and the Allocation of Resources for Inventions*. Princeton University Press.

ATSE. (2013, December 13). *Agreement Technologies in Software Engineering*. <https://cs-gw.utcluj.ro/adrian/workshops/ATSE2013.html>

Autio, O., Jamsek., J., Soobik, M., & Olafsson, B. (2019). Technology education in Finland, Slovenia, Estonia and Iceland: The structure of students' attitudes towards technology. *International Journal of Technology in Education and Science*, 3(2), 95-106. <https://www.ijtes.net>

Azjen, I., & Fishbein, M.A. (1980). *Understanding attitudes and predicting social behaviour*. Prentice Hall.

Babbie, E., & Mouton, J. (2006). *The Practice of Social Research*. (5<sup>th</sup> ed.). Chris Caldeira.

Babbie, E. (2010). *The practice of social research*. (12<sup>th</sup> ed.). Wadsworth.

Bahia, K., Castells, P., & Pedros, X. (2019). *The impact of mobile technology on economic growth: global insights from 2000-2017 developments*. 30<sup>th</sup> European Conference of the International Telecommunications Society: Towards a Connected and Automated Society, Helsinki, Finland. <https://hdl.handle.net/10419/205164>

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Barak, M. (2004). The Use of Computers in Technological Studies: Significant Learning or Superficial Activity? *Journal of Computers in Science Teaching*, 23(4), 329-346. <https://www.learntechlib.org/p/11435>

Barbour, M.K. (2007). Teacher and developer perceptions of effective web-based design for Secondary school students. *Journal of Distance Education*, 21(3), 93-114. <https://www.jofde.ca/index.php/jde/article/view/30>

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: study design and implementation for novice researchers. *The qualitative report*, 13(4), 544-559. <https://doi.org/10.46743/2160-3715/2008.1573>

Baylor, L.A., & Richie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Journal of Computers and Education*, 39(2), 395-414. [https://doi.org/10.1016/S0360-1315\(02\)00075-1](https://doi.org/10.1016/S0360-1315(02)00075-1)

Belland, B.R. (2009). Using the theory of habitus to move beyond the study of barriers to technology integration. *Computers and Education*, 52(2), 353-364. <https://doi.org/10.1016/j.compedu.2008.09.004>

Bentham, H. (2013). Clearing the path that has been laid: A conceptualization of education for sustainable development. *Journal of Teacher Education for Sustainability*, 15(2), 25-41. <https://doi.org/10.2478/jtes-2013-0009>

Bergold, J., & Stefan, T. (2012). Participatory Research Methods: A Methodological Approach in Motion. *Journal of Qualitative Social Research*, 13(1), 1-30. <https://doi.org/10.17169/fqs-13.1.1801>

Bernstein, B. (2000). *Pedagogy, Symbolic Control and Identity*. Rowman and Littlefield Publishers.

Bertram, C., & Christainson, I. (2014). *Understanding Research: An introduction to reading research*. (1<sup>st</sup> ed). Van Schaik.

Bertram, C., & Christiansen, I. (2020). *Understanding Research: An introduction to understanding research* (2<sup>nd</sup> ed.). Van Schaik.

Bingimlas, K. (2009). Barriers to the Successful Integration of ICT in Teaching and Learning Environments: A Review of the Literature. *Eurasia Journal of Mathematics Science and Technology Education*, 5(3), 235-245. <https://doi.org/10.12973/ejmste/75275>

Black, P.J., & William, D. (2018). Classroom assessment and pedagogy. *Assessment in Education Principles Policy and Practice*, 25(1), 1-25. <https://doi.org/10.1080/0969594X.2018.1441807>

Bloomberg, L.D., & Volpe, M. (2022). *Completing your qualitative dissertation: A road map from beginning to end*. Sage Publications.

Botelho, F.H.F. (2021). Childhood and Assistive Technology: Growing with opportunity, developing with technology. *Assistive Technology: the official journal of RESNA*, 33(1), 87-93. <https://doi.org/10.1080/10400435.2021.1971330>

- Bradley, J. (2012). If We Build It They Will Come? The Technology Acceptance Model. *Information Systems Theory*, 28(1), 19-36. <https://doi.org/10.1007/978-1-4419-6108-2-2>
- Bredo, E. (1997). The Social Construction of Learning. *Handbook of Academic Learning: Construction of Knowledge*. Academic Press.
- Briggs, A.R.J., Clark, J., & Hall, I. (2012). Building bridges: Understanding student transition to University. *Quality in Higher Education*, 18(1), 3-21. <https://doi.org/10.1080/13538322.2011.614468>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1177/1478088706290630a>
- Braun, V., & Clarke, V. (2013). *Successful Qualitative Research: A Practical Guide for Beginners*. Sage Publications.
- Bray, A., & Tangney, B. (2017). Technology usage in mathematics educational research- A systematic review of recent trends. *Computers and Education*, 114(2), 255-273. <https://doi.org/10.1016/j.compedu.2017.07.004>
- Broekhuizen, M. L. (2016). Technology integration in education: A review of research and practice. *Educational Technology Research and Development*, 64(3), 491-512. <https://doi.org/10.1007/s11423-016-9445-2>
- Bryman, A. (2016). *Social Research Methods*. (5<sup>th</sup> ed.). Oxford University Press.
- Buabeng-Andoh, C. (2012). Factors Influencing Teachers' Adoption and Integration of Information and Communication Technology into Teaching: A Review of the Literature. *International Journal of Education and Development using Information and Communication Technology*, 8(1), 136-155. <https://www.learntechlib.org/p/188018/>
- Buchanan, R. (2020). Through growth to achievement: Examining edtech as a solution to Australia's declining educational achievement. *Policy Futures in Education*, 18(8), 1026-1043. <https://doi.org/10.1177/1478210320910293>
- Bugliarello, G. (2000). Reflections on Technological Literacy. *Bulletin of Science, Technology and Society*, 20(2), 83-89. <https://doi.org/10.1177/027046760002000201>

Burgelman, R.A., Maidique, M.A., & Wheelwright, S.C. (1996). *Strategic Management of Technology and Innovation*. (2<sup>nd</sup> ed.). I.L. Irwin Publishers.

Cahyani, H., & Cahyono, Y.B., (2012). Teachers' Attitudes and Technology use in Indonesian Classrooms. *TEFLIN Journal*, 23(2), 130-148.

<https://doi.org/10.15639/teflinjournal.v23i2/130-148>

Chan, F.M. (2002, October). *ICT in Malaysian schools: Policies and strategies*. Paper presented at a workshop on the promotion of ICT in education to narrow the digital divide, Tokyo, Japan.

Chapelle, C. (2011). *Computer applications in second language acquisition: Foundations for teaching, testing and research*. Cambridge University Press.

Chau, P.Y.K., & Hu, P.J. (2002). Examining a Model of Information Technology Acceptance by Individual Professionals: An Exploratory Study. *Journal of Management Information Systems*, 18(4), 191-229. <https://www.jmis-web.org>

Chau, T.Q., & Nguyen, T.T.H. (2021). A Theoretical Study on the Genuinely Effective Technology Application in English Language Teaching for Teachers and Students. *AsiaCALL Online Journal*, 12(5), 17-23. <https://asiacall.info/acoj>

Cheng, S.L., & Xie, K. (2018). *The relations among teacher value beliefs, personal characteristics, and TPACK in intervention and non-intervention settings*. Elsevier Ltd. Publishers.

Chigona, A., Chigona, W., & Davis, Z. (2010, March 25-26). *Motivating factors: Educators' use of ICT on schools in disadvantaged areas in the Western Cape*. Proceedings of International Conference on Information Management and Evaluation. University of Cape Town.

Chowdhury, A.S., Arefin, Sh., & Rahaman, M.M. (2018b). Impacts of ICT integration in the higher education classrooms: Bangladesh perspective. *Journal of Education and Practice*, 9(32), 82-86. <https://www.researchgate.net>

Chowdhury, T., Adafin, J., & Wilkinson, S. (2019). Review of Digital Technologies to Improve Productivity of New Zealand Construction Industry. *Journal of Information Technology in Construction*, 24(1), 569-587. <https://doi.org/10.36680/j.itcon.2019.032>

- Cloete, A. (2017). Technology and education: Challenges and opportunities. *HTS Theological Studies*, 73(4), 1-7. <https://doi.org/10.4102/hts.v73i4.4589>
- Clarke, V., & Braun, V. (2017). Thematic Analysis. *The Journal of Positive Psychology*, 12(3), 297-298. <https://doi.org/10.1080/17439760.2016.1262613>
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education*. (6<sup>th</sup> ed.). Routledge.
- Cohen, L., Manion, L., & Morrison, K. (2011). *Research Methods in Education* (7<sup>th</sup> ed). Routledge.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research Methods in Education*. (8<sup>th</sup> ed.). Routledge. <https://doi.org/10.4324/9781315456539>
- Coklar, A.N., & Yurdakul, I.K., (2017). Technology integration experiences of teachers. *Journal of Discourses and Communication on sustainable education*, 8(1), 19-31.
- Conrad, K.M., & Dillon, J.M. (2020). Mobile Technology Adoption Across the Lifespan: A mixed methods investigation to clarify adoption stages, and the influence of diffusion attributes. *Computers in Human Behaviour*, 112(1), 106-456. <https://doi.org/10.1016/j.chb.2020.106456>
- Costley, K.C. (2014). *The positive effects of technology on teaching and student learning*. Arkanas Tech University.
- Creswell, J.W. (2008). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. (3<sup>rd</sup> ed.). Sage Publications.
- Creswell, J.W., & Plano Clark, V.L. (2011). *Designing and Conducting Mixed Methods Research*. (2<sup>nd</sup> ed.). Sage Publications.
- Creswell, J.W., & Creswell, J.D. (2017). *Research Design: Qualitative, Quantitative, and Mixed Method Approaches*. (4<sup>th</sup> ed.). Sage Publications.
- Crompton, H. (2013). *A historical overview of mobile learning: Toward learner-centred education*. Routledge Publishers.

Cuban, L. (2012, June 7). Three ways of integrating technology in schools. *WordPress*. <https://larrycuban.wordpress.com/2012/06/07/three-ways-of-integrating-technology-in-schools>

Davis, F.D. (1986). *A Technology Acceptance Model for Empirically Testing New End-User Information Systems*. (Doctoral of Philosophy Thesis) in Management, Wayne State University. Massachusetts Institute of Technology. <https://hdl.handle.net/1721.1/15192>

Davis, F.D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *Management Information Systems Research (MIS)*, 13(3), 319-400. <https://doi.org/10.2307/249008>

Davis, F.D., Bagozzi, R.P., & Warshaw, P.R., (1989). User Acceptance of Computer Technology: A comparison of two theoretical models. *Journal of Management Science*, 35(8), 982-1003. <https://doi.org/10.1287/mnsc.35.8.982>

Dawson, K., Cavanaugh, C., & Ritzhauot, A.D. (2008). Florida's EETT Leveraging Laptops Initiatives and Its Impact on Teaching Practices. *Journal of Research on Teaching in Education*, 41(2), 143-159. <https://doi.org/10.1080/15391523.2008.10782526>

Denscombe, M. (2007). *The Good Research Guide: For small-scale social research projects*. Open University Press Publishers.

Denzin, N.K., & Lincoln, Y.S. (1998). *The landscape of qualitative research: Theories and issue*. Sage Publications.

Denzin, N.K., & Lincoln, Y.S. (2018). *The SAGE Handbook of Qualitative Research*. (5<sup>th</sup> ed.). Sage Publications.

Department of Basic Education. (2004). *Transforming Learning and Teaching through ICT*, Draft White Paper on e-Education. South African Government.

Department of Basic Education. (2006). *National Assessment Report (Public Ordinary Schools)*. National Education Infrastructure Management System (NEIMS). South African Government. [https://www.gov.za/sitesdefault/files/gcis\\_document/201409/educattion-annual-report-0708.pdf](https://www.gov.za/sitesdefault/files/gcis_document/201409/educattion-annual-report-0708.pdf)

Department of Basic Education. (2007). *National Assessment Report (Public Ordinary Schools). National Education Infrastructure Management System (NEIMS)*. South African Government. [https://www.gov.za/sitesdefault/files/gcis\\_document/201409/education-annual-report-0708.pdf](https://www.gov.za/sitesdefault/files/gcis_document/201409/education-annual-report-0708.pdf)

Department of Basic Education. (2011). *Curriculum and Assessment Policy Statement (CAPS). Grade 10-12: Mathematics*. South African Government. [https://www.gov.za/sitesdefault/files/gcis\\_document/www.education.gov.za/CAPS](https://www.gov.za/sitesdefault/files/gcis_document/www.education.gov.za/CAPS)

Department of Basic Education. (2014). *Draft Gender Equity Policy Framework for Basic Education*. Draft White Paper on e-Education. South African Government.

Department of Basic Education. (2016). *e-Education White Paper*. South African Government.

Department of Basic Education. (2018). *Education Statistics in South Africa*. South African Government.

Department of Basic Education. (2020). *Technology Integration in Schools: A comprehensive guide*. South African Government. <https://www.education.gov/tech2020>

Department of Science, Technology and Innovation. (2019). *Science, technology and innovation enabling inclusive and sustainable South African development in a changing world* White Paper. South African Government.

De Vos, A., Strydom, H., Fouche, C., & Delpont, C. (2011). *Research at Grass Roots: For Social Sciences and Human Services Professions*. Van Schaik Publications.

Dewey, J. (1925). *Experience and nature*. Dover Publications.

Dewey, J. (1938). *Experience and Education*. Macmillan Publications.

Dewey, J. (1938/1997). *Experience and education*. Macmillan Publications.

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 ICT*, 14(2), 1846-1884. <https://www.learntechlib.org/p/184684/>.

- Dong, C., & Newman, L. (2018). Enacting Pedagogy in ICT Enabled Classrooms: Conversations with Teachers in Shanghai. *Technology, Pedagogy and Education*, 27(4), 499-511. <https://doi.org/10.1080/1475939x2018.1517660>
- Doucet, A., Evers, J., Guerra, E., Lopez, N., Soskil, M., & Timmers, K. (2018). *Teaching in the Fourth Industrial Revolution: Standing at the Precipice*. Routledge.
- Drayton, B., Falk, J.K., Stroud, R., & Hobbs, K. (2010). After Installation: Ubiquitous Computing and High School Science in Three Experienced, High-Technology Schools. *Journal of Technology, Learning and Assessment*, 9(3), 1-56. <https://ejournals.bc.edu/ojs/index.php/jtla/article/view/1608>
- Drijvers, P. (2013). Digital Technology in Mathematics Education: Why it works (or doesn't). *Institute of Education Sciences*, 8(1), 1-20. [https://doi.org/10.1007/978-3-319-17187-6\\_8](https://doi.org/10.1007/978-3-319-17187-6_8)
- Drossel, K., Eickelmann, & Gerick, J. (2017). Predictors of teachers' use of ICT in school- the relevance of school characteristics, teachers' attitudes and teacher collaboration. *Education and Information Technologies*, 22(2), 551-573. <https://doi.org/10.1007/s10639-016-9476-y>
- Dudney, G. (2010). *The internet and the language classroom*. Cambridge University Press.
- Du Plessis, E., Conley, L., & Du Plessis, P. (2007). *Teaching and Learning in South African schools*. Van Schaik.
- Durrheim, K. (2004). *Research Design, Research in practice: Applied methods for the social sciences*. UCT Press.
- Eady, M.J., & Lockyer, L. (2013). *Tools for learning: Technology and teaching strategies*. Cambridge University Press.
- Eagly, A.H., & Chaikem, S. (1993). The Psychology of Attitudes. *Psychology and Marketing*, 12(5), 459-466. <https://worldcat.org/title/489777652>
- Eickelmann, B., & Vennemann, M. (2017). Teachers' attitudes and beliefs regarding ICT in teaching and learning in European countries. *European Educational Research Journal*, 16(6), 733-761. <https://doi.org/10.1177/1474904117725899>

Emre, D. (2019). Prospective Teachers' Perceptions of Barriers to Technology Integration in Education. *Contemporary Educational Technology*, 10(4), 381-398.

<https://doi.org/10.30935/cet.634187>

Erdemir, N., Bakirci, H., & Eyduran, E. (2009). Determining of Student Teachers' Self-Confidence Using Technology in Instruction. *Journal of Turkish Science Education*, 6(3), 99-108. <https://www.tused.org>

Eristi, S.D, Kurt, A., & Dinadar, M. (2012). Teachers' Views about Effective Use of Technology in Classrooms. *Turkish Online Journal*, 3(2), 30-41.

<https://doi.org/10.17569/tojqi.51671>

Ertmer, P.A. (2009). Addressing first-and second order barriers to change: Strategies for technology integration. *Educational Technology Research Development*, 47(4), 47-61.

<https://doi.org/10.1007/BF02299597>

Etikan, I., Musa, S.A., & Alkassim, R.S. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4.

<https://doi.org/10.11648/j.ajtas.20160501.11>

Farjon, D., Smits, A., & Voogt, J. (2019). Technology integration of pre-service teachers explained by attitudes and beliefs, competency, access and experience. *Computers and Education*, 130(1), 81-93. <https://doi.org/10.1016/j.compedu.2018.11.010>

Fataar, A. (2020, June 11). A Pedagogy of Care: Teachers rise to the challenge of the new normal. *Daily Maverick*. <https://www.dailymaverick.co.za/article/2020-06-22-a-pedagogy-of-care-teachers-rise-to-the-challenge-of-the-new-nromal/>

Fishbein, M.A., & Azjen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Fu, J.S. (2013). ICT in Education: A Critical Literature Review and Its Implication. *International Journal of Education and Development Using Information and Communication Technology*, 9(1), 112-125. <https://www.learntechlib.org/p/111900/>

Garcia, L.C.C., Jimenez, I.A.C., Violante, G.M., Marcolin, F., & Vezzetti., E. (2020). Commonly Used External TAM Variables in e-Learning, Agriculture and Virtual Reality Applications. *Department of Management and Production Engineering*, 13(1), 1-21. <https://doi.org/10.3390/fi13010007>

Garrison, J. (1994). Realism, Deweyan, Pragmatism and Educational Research. *Journal of Educational Researcher*, 23(1), 5-14. <https://doi.org/10.23007/1176280>

Geldreich, K., & Hubwieser, P. (2020). *Programming in primary schools: Teaching on the edge of formal and non-formal learning*. Springer Publications.

George, A., & Sanders, M. (2017). Evaluating the potential of teacher-designed technology-based tasks for meaningful learning: Identifying needs for professional development. *Education and Information Technologies*, 24(6), 2871-2895. <https://doi.org/10.1007/s10639-017-9609-y>

Gie, R., & Beyers, N. (2014). *Getting started in clinical research: Guidance for junior researchers*. Cape Town: Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University.

Gillespie, H. (2006). *Unlocking learning and teaching with ICT: Identifying and overcoming barriers*. David Fulton.

Goetz, G. (2020). The Odyssey of Pedagogies of Technoscientific Literacies. *Postdigital Science and Education*, 3(1), 520-545. <https://doi.org/10.1007/s42438-020-00188-3>

Goldstein, O., & Tessler, B. (2017). The impact of the National Program to integrate ICT in teaching in pre-service teacher training. *Interdisciplinary Journal of E-Learning and Learning Objects*, 13(1), 151-166. <https://doi.org/10.28945/3876>

Graddol, D. (1997). *The Future of English? A guide to forecasting the popularity of the English language in the 21<sup>st</sup> century*. The English Company.

Gray, K., Kennedy, G.E., Judd, T.S., Churchward, A., & Krause, K.L. (2008). First year students' experiences with technology: Are they really digital natives? *Australian Journal of Educational Technology*, 24(1), 108-122. <https://doi.org/10.14742/ajet.1233>

Grubler, A. (2003). *Technology and Global Change*. International Institute for Applied Systems and Analysis. Cambridge University Press.

Gu, X., Zhu, Y., & Guo, X. (2013). Meeting the “digital natives”: understanding the acceptance of technology in classrooms. *Educational Technology and Society*, 16(1), 392-402. <https://doi.org/10.1177/1469787417723231>

Hadiyanto, M., Amirul, F., Arif, N., Fajaryani, N., & Habibi, A. (2017). In Search of Quality Student Teachers in a Digital Era: Reframing the Practices of Soft Skills in Teacher Education. *Turkish Online Journal of Educational Technology*, 16(3), 71-78. <https://www.tewtjournal.org>

Hanifa, F., Hardinata, A., Simatupang, H., Latip, A., Efwinda, S., & Yogica, R. (2020). Survey on the effectiveness of online lectures during Covid-19 pandemic: Methods and Difficulties. *Indonesian Science Education Research*, 2(2), 7-12. <https://jurnal.unimed.ac.id/2012/index.php/iser>

Harryanto., Muchriana, M., Ansari, S.A. (2018). Application of TAM model to the use of information technology. *International Journal of Engineering and Technology*, 7(29), 37-40. <https://www.sciencepubco.com/index.php/IJET>

Hart, S., & Laher, S. (2015). Perceived usefulness and culture as predictors of teachers' attitudes towards educational technology in South Africa. *South African Journal of Education*, 35(4), 1-13. <https://doi.org/10.15700/saje.v35na1180>

Hechter, R., & Vermette, L. (2013). Technology Integration in K-12 Science Classrooms: An analysis of barriers and implications. *Themes in Science and Technology Education*, 6(2), 73-90. <https://www.learntechlib.org/p/148638/>

Hennessy, S., & Murphy, C. (2020). The Role of Digital Technologies in Education: Perspectives from the UK and Beyond. *Educational Technology Research and Development*, 68(3), 1217-1234. <https://doi.org/10.4324/9780429356789>

Hennessy, S., Ruthven, K., & Brindley, S. (2010). Teacher Perspectives on Integrating ICT into Subject Teaching: Commitment, Constraints, Caution, and Change. *Journal of Curriculum Studies*, 37(2), 155-192. <https://doi.org/10.1080/0022027032000276961>

Herron, C.A., Hanley, J.E.B., & Cole, S. (1995). A comparison study of two advance organizers for introducing beginning foreign language students to video. *The Modern Language Journal*, 79(3), 387-395. <https://doi.org/10.1111/J.1540-4781.1995.TB01116.X>

Hixon, E., & Buckenmeyer, J. (2009). Revisiting technology integration in schools: Implications for professional development. *Computers in the Schools*, 26(2), 130-146. <https://doi.org/10.1080/07380560902906070>

Hofer, M., & Swan, K.O., (2011). Technological pedagogical content knowledge in action: A case study of a middle school digital documentary project. *Journal of Research on Technology in Education*, 41(2), 179-200. <https://doi.org/10.1080/15391523.2008.10782528>

Hoffman, T. (1999). *Probabilistic latent semantic indexing*. Proceedings of the 22<sup>nd</sup> annual international ACM SIGIR Conference on research and development in information retrieval. Berkeley (pp.211-218). <https://doi.org/10.1109/BigDataCongress.2015.21>

Hohr, H. (2013). The Concept of Experience by John Dewey Revisited: Conceiving, Feeling and “Enlivening”. *Studies in Philosophy Education*, 32(1), 25-38. <https://doi.org/10.1007/s11217-012-9330-7>

Hong, X., Liu, Q., & Zhang, M. (2021). Preschool Teachers’ Technology Acceptance During the COVID-19: An Adapted Technology Acceptance Model. *Frontiers in Psychology*, 12(1), 1-11. <https://doi.org/10.3389/fpsyg.2021.691492>

Hootf Graafland, J. (2018). *New Technologies and 21<sup>st</sup> century children*. Organisation for Economic Co-operation and Development Publication.

Hussein, Z. (2017). Leading to Intention: The Role of Attitude in Relation to Technology Acceptance Model in E-Learning. *Procedia Computer Science*, 105(1), 159-164. <https://doi.org/10.1016/j.procs.2017..1.196>

Hyman, M.R., & Sierra, J.J. (2016). *Open-versus close-ended survey questions*. Business Outlook.

Inan, F.A., & Lowther, D.L., (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Journal of Education Tech Research Development*, 58(2), 137-154. <https://doi.org/10.1007/s11423-009-9132-y>

Islami, M.M., Asdar, M., & Baumassepe, A.N. (2021). Analysis of perceived usefulness and perceived ease of use on the actual system usage through attitude using online guidance application. *Hasanuddin Journal of Business Strategy*, 3(1), 52-64.

<https://doi.org/10.26487/hjbs.v3i1.410>

Juma, M.F., Fue, K.G., Barakabitze, A.A., Nicodemus, N., Magesa, M.M., Kilima, F.T.M., & Sanga, C.A. (2017). Understanding Crowdsourcing of Agricultural Market Information in a Pilot Study: Promises, Problems and Possibilities (3Ps). *International Journal of Technology Diffusion (IJTD)*, 8(4), 1-16. <https://doi.org/10.4018/978-1-5225-8362-2.ch044>

Kao, C.P., Wu, Y.T., & Chang, Y.Y. (2020). Understanding Web-Based Professional Development in Education: The Role of Attitudes and Self-efficacy in Predicting Teachers' Technology- Teaching Integration. *Asia-Pacific Educational Research*, 29(1), 405-415.

<https://doi.org/10.1007/s40299-019-00493-x>

Khoza, S.B. (2018). Can Teachers' Reflections on Digital and Curriculum Resources Generate Lessons. *Africa Education Review*, 15(4), 20-35.

<https://doi.org/10.1080/18146627.2017.1305869>

Kimmons, R., & Hall, C.S. (2016). Towards a Broader Understanding of Teacher Technology Integration Beliefs and Values. *Journal of Technology and Teacher Education*, 24(3), 309-335.

<https://www.learntechlib.org/primary/p/172627/>

Kirschner, P. (2015). Do we need teachers as designers of technology enhanced learning? *Instructional Science*, 43(2), 309-322. <https://doi.org/10.007/s111251-015-9346-9>

Kiraz, E., & Ozdemir, D. (2006). The Relationship between Educational Ideologies and Technology Acceptance in Pre-service Teachers. *Educational Technology and Society*, 9(2), 152-165. [https://www.j-ets.net/ETS/journals/9\\_2/13.pdf](https://www.j-ets.net/ETS/journals/9_2/13.pdf)

Koch, T. (1994). Establishing rigour in qualitative research: The decision trail. *Journal of Advanced Nursing*, 19(5), 976-986. <https://doi.org/10.1111/j.1365-2648.1994.tb01177.x>

Kolbakova, F. (2014). *The Use of ICT among the Teachers of English in Estonia by Comparison with Europe and Asia* (Master's Thesis), University of Tartu, Estonia.

[https://dspace.ut.ee/bistream/handle/10062/46990/Master's\\_Thesis\\_Kolbakova.pdf](https://dspace.ut.ee/bistream/handle/10062/46990/Master's_Thesis_Kolbakova.pdf)

Kopcha, T.J. (2012). *Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development*. Elsevier Ltd. Publishers.

Krueger, R., (1998). *Focus Group: A practical guide for applied research*. SAGE Publications.

Kumar, V., Kumar, U., & Persaud, A. (1999). Building Technological Capability Through Importing Technology: The Case of Indonesian Manufacturing Industry. *The Journal of Technology Transfer*, 24(1), 81-96. <https://doi.org/10.1023/A:1007728921126>

Kusumarasyati, (2004, July). *Listening, Viewing and Imagination, Movie in EFL classes*. Paper Presented at Second International Conference on Imagination and Education, Vancouver.

Lambert, S.D., & Loiselle, C.G. (2007). Health Information- Seeking Behavior. *Qualitative Health Research*, 17(8), 1006-1019. <https://doi.org/10.1177/1049732307305199>

Lee, C.B., Teo, T., & Chai, C.S. (2008). Understanding pre-service teachers' computer attitudes: applying and extending the technology acceptance model. *Journal of computer assisted learning*, 24(2), 128-143. <https://doi.org/10.1111/j.1365-2729.2007.00247.x>

Leedy, P.D. (1997). *Practical research: Planning and Design*. (6<sup>th</sup> ed.). Prentice-Hall

Leedy, P.D., & Ormrod, J.E. (2005). *Practical Research: Planning and Design*. Prentice Hall Publishers.

Lehtinen, A., Nieminen, P., & Viri, J. (2016). Preservice Teachers' TPACK Beliefs and Attitudes toward Simulations. *Contemporary Issues in Technology and Teacher Education*, 16(2), 151-171. <https://www.learntechlib.org/primary/p161874>

Lewis, M.W. (2000). Exploring Paradox: Toward a More Comprehensive Guide. *The Academy of Management Review*, 25(4), 760-776. <https://doi.org/10.2307/259204>

Li, L. (2014). Understanding language teachers' practice with educational technology: A case from China. *System*, 46(1), 105-119. <https://doi.org/10.1016/j.system.2014.07.016>

Li, L. (2017). *New Technologies and Language Learning*. Palgrave.

- Lin, T., Chen, N-S., Hsiu-Chia, K., & Kinshuk. (2004). *Synchronous learning model over the internet*. International Conference on Advanced Learning Technologies.  
<https://doi.org/10.1109/ICALT.2004.1357466>
- Lincoln, Y., & Guba, E.G. (1985). *Naturalistic inquiry*. Sage Publications.
- Lincoln, Y., & Guba, E.G. (1989). *Fourth Generation Evaluation*. Sage Publications.
- Livingstone, S. (2012). Critical Reflections on the Benefits of ICT in Education. *Oxford Review of Education*, 38(1), 9-24. <https://doi.org/10.1080/03054985.2011.577938>
- Loughran, J.J. (2006). *Developing a Pedagogy of Teacher Education: Understanding Teaching and Learning about Teaching*. Routledge.
- Lui, A. (2011). Study on the Triple Helix Model of the Transformation of Scientific and Technological Achievements in China. *Research in Science Studies*, 8(1), 1129-1134.  
<https://sciro.org/> Levin, J.A., Bruce, B. (2001). *Roles for new technologies in language arts: Inquiry, communication, construction, and expression*. Macmillan Publications.
- Luo, J.J. (2004). *Using DVD films to enhance college freshmen's English listening comprehension and motivation*. National Tsing Hua University.
- MacFarlane, K., & Woolfson, L. (2013). Teacher attitudes and behaviour toward the inclusion of children with social, emotional and behavioural difficulties in the mainstream schools: An application of the theory of planned behaviour. *Teaching and Teacher Education*, 29(1), 46-52. <https://doi.org/10.1016/j.tate.2012.08.006>
- Makgato, M. (2014). Challenges Contributing to Poor Integration of Educational Technology at Some Schools in South Africa. *Mediterranean Journal of Social Sciences*, 5(20), 1285-1292.  
<https://doi.org/10.5901/mjss.2014.v5n20p1285>
- Mamba, M.S.N., & Isabirye, N. (2015). A Framework to Guide Development Through ICTs in Rural Areas in South Africa. *Information Technology for Development*, 21(1), 135-150.  
<https://doi.org/10.1080/02681102.2013.87431>
- Margot, K.C., & Kettler, T. (2019). Teachers' perception of STEM integration and education: A systematic literature review. *International Journal of STEM Education*, 6(1), 1-16.  
<https://doi.org/10.1186/s40594-018-0151-2>

- Maree, N., & Vos, D. (2021). The Influence of Value and Science and Technology in the Education Systems of South Africa and Russia. *Perspectives in Education*, 39(4), 27-42. <https://doi.org/10.18820/2519593X/pie.v39.i4.3>
- Maxwell, J.A. (2013). *Qualitative Research Design: An Interactive Approach*. Sage Publications.
- McCulloch, A.W., Hollebrands, K., Stohl Lee, H., & Harrison, T. (2018). Factors That Influence Secondary Mathematics Teachers' Integration of Technology in Mathematics Lessons. *Computers and Education*, 123(4), 26-40. <https://doi.org/10.1016/j.compedu.2018.04.008>
- McMillan, J.H., & Schumacher, S. (2010). *Research in Education: Evidence-Based Inquiry*. Pearson Education.
- Mdlongwa, T. (2012). *Information and Communication Technology (ICT) as a Means of Enhancing Education in Schools in South Africa: Challenges, Benefits and Recommendations* (Report No. 80). Pretoria, Africa Institute of South Africa.
- Merriam, S.B., & Tisdell, E.J. (2016). *Qualitative Research: A Guide to Design and Implementation*. (4<sup>th</sup> ed.). Jossey Bass.
- Miller, C.C. (2015, January 15). Technology Has Made Life Different, but Not Necessarily More Stressful. *The New York Times*. <https://www.nytimes.com/2015/01/16/upshot/technology-has-made-life-different-but-not-necessarily-more-stressful>
- Mofareh, A.A. (2019). The Use of Technology in English Language Teaching. *Frontiers in Education Technology*, 2(3), 168-180. <https://doi.org/10.22158/fet.v2n3p168>
- Mugo, G.D., Njagi, K., Chemwei, B., & Motanya, J. (2017). The Technology Acceptance Model (TAM) and its Application to the Utilization of Mobile Learning Technologies. *British Journal of Mathematics and Computer Science*, 20(4), 1-8. <https://doi.org/10.9734/BJMCS/2017/29015>
- Morgan, D. (1998). *Planning focus groups*. Sage Publications.

Motala, S., & Sayed, Y. (2009, June 30). 'No Fee' Schools in South Africa: Policy Brief. <https://files.eric.ed.gov/fulltext/ED508824.pdf>

Mouza, C. (2008). Learning with Laptops: Implementation and Outcomes in an Urban, Under-Privileged School. *Journal of Research on Technology in Education*, 40(4), 447-472. <https://www.learntechlib.org/p/166940>

Mozjeko, A., Caputi, P., Howard, S.K., & Chan, A. (2015). Technology practices: Confirmatory factor analysis and exploration of teachers' technology integration in subject areas. *Computers Education*, 90(1), 24-35. <https://doi.org/10.1016/j.compedu.2015.09.008>

Mthethwa, M.Z. (2015). *Application of GeoGebra on Euclidean geometry in rural High Schools-Grade 11 learners*. University of Zululand.

Mumtaz, S. (2000). Factors Affecting Teachers' Use of Information and Communications Technology: A Review of the Literature. *Journal of Information Technology for Teacher Education*, 9(3), 319-342. <https://doi.org/10.1080/14759390000200096>

Mustafina, A. (2016). Teachers' Attitudes Toward Technology Integration in a Kazakhstani Secondary School. *International Journal of Research in Education and Science (IJRES)*, 2(2), 322-332. <https://doi.org/10.21890/ijres.67928>

Naicker, V., & Bessick, J. (2013). Barriers to tacit knowledge retention: An understanding of the perceptions of the knowledge management of people inside and outside the organization. *South African Journal of Information Management*, 15(2), 1-8. <https://doi.org/10.4102/sajim.v15i2.556>

Ndibamela, P. (2014). Teachers' Attitudes towards the Use of Information Communication Technology (ICT) as a Pedagogical Tool in Secondary Schools in Tanzania: The Case of Kondo District. *International Journal of Education and Research*, 2(2), 1-16. <https://www.ijern.com>

Negroponte, N. (1995). *Being Digital*. Alfred Knopf Publications.

Niewenhuis, J. (2010). *Introducing qualitative research. First Steps in research*. Van Schaik Publications.

Nikolopoulou, K., & Gialamas, V. (2015). ICT and Play in Preschool: Early Childhood Teachers' Beliefs and Confidence. *International Journal of Early Years Education*, 23(4), 409-425. <https://doi.org/10.1080/09669760.2015.1078727>

Nkula, K., & Krauss, K.E. (2014). *The Integration of ICTs in Marginalized Schools in South Africa: Considerations for understanding perceptions of in-service teachers and the role of training*. 8<sup>th</sup> International Development Informatics Association (IDIA) Conference, Port Elizabeth.

Nomalungelo, G. (2018). *Three-Stream Model; Fourth Industrial Revolution: Department progress report*. South African Basic Education.

Ntuli, E., & Kyei-Blankson, L. (2012). Teacher Assessment of Young Children Learning with Technology in Early Childhood Education. *International Journal of Information and Communication Technology Education*, 8(4), 1-10. <https://doi.org/10.4018/jitce.201210001>

Ojo, O.A., & Adu, E.O., (2018). The effectiveness of Information & Communication. *Technological ICTs in teaching and learning high schools in the Eastern Cape Province*, 38(2), 1-11. <https://doi.org/10.15700/sage.v38ns2a1483>

Oju, O., & Adu, E. (2018). The effectiveness of Information and Communication Technologies (ICTs) in teaching and learning in high schools in Eastern Cape Province. *South African Journal of Education*, 38(2), 148-311. <https://doi.org/10.15700.saje.v38ns2a1483>

Olelewe, C.J., & Amaka, E.U. (2011, October 17-21). *Effective utilisation of Information and Communication Technology (ICT) for sustainable manpower development among computer educators in colleges of education in the South-East geo-political zone of Nigeria*. Paper presented at the 24<sup>th</sup> National Association of Technology Teachers (NATT) on Technical Vocational Education and Training (TVET) for Sustainable Industrial Development in Nigeria, Nigeria.

Ong, C.S., & Lai, J.Y (2006). Gender Differences in Perceptions and Relationships among Dominants of E-Learning Acceptance. *Computers in Human Behaviour*, 22(5), 816-829. <https://doi.org/10.1016/j.chb.2004.03.006>

- Onita, G.C., Zhang, Q., Banks, M.S., & Zhang, X. (2021). Understanding switching behaviour of mobile payment enabled transportation apps: A push-pull-mooring perspective. *Issues in Information Systems*, 22(1), 124-135. [https://doi.org/10.48009/1\\_iis\\_2021\\_124-135](https://doi.org/10.48009/1_iis_2021_124-135)
- Ortega G.J.L., & Fuentes, A.R. (2015). Communication Skills Training in Trainee Primary School Teachers in Spain. *Journal of Teacher Education for Sustainability*, 17(1), 86-98. <https://doi.org/10.1515/jtes-2015-0007>
- Ottenbreit-Leftwich, A., Ertmer, P., & Tondeur, J. (2015). *Teacher beliefs and uses of technology to support 21<sup>st</sup> Century Teaching and Learning*. Routledge.
- Oye, N.D., Iahad, N., Rahim, Ab., & Rahim, N.Z. (2014). The history of UTAUT model and its impact on ICT acceptance and usage by academicians. *Education and Information Technologies*, 19(1), 251-270. <https://doi.org/10.1007/s10639-012-9189-9>
- Oyunge, T.O. (2021). Exploring Secondary School Teachers' Pedagogical Beliefs and the Integration of ICT in the Context of a Developing Country: A Technology Acceptance Model Perspective. *European Journal of Education Studies*, 8(3), 206-231. <https://doi.org/10.46827/ejes.v8i3.3639>
- Ozer, Z. (2018). An investigation of prospective ELT teachers; attitudes towards using computer technologies in foreign language teaching. *Journal of Language and Linguistic Studies*, 14(1), 328-341. <https://doi.org/10.3316/informit.865531538455708>
- Paluri, R., & Mehra, S. (2015). Exploring the acceptance for e-learning using technology acceptance model among university students in India. *International Journal of Process Management and Benchmarking*, 5(2), 194-210. <https://doi.org/10.1504/IJPMB.2015.068667>
- Pamuk, S., Ergun, M., Cakir, R., & Yilmaz, H.B. (2013). Exploring relationships among TPACK components and development of the TPACK instrument. *Education and Information Technologies*, 20(2), 1-23. <https://doi.org/10.1007/s10639-013-9278-4>
- Panakaje, N., Ur Rahiman, H., Parvin, S.M.R., P, S., K, M., Yatheen, & Irfana, S. (2024). Revolutionizing pedagogy: Navigating the integration of technology in higher education for teacher learning and performance enhancement. *Cogent Education*, 11(1), 1-28. <https://doi.org/10.1080/2331186X.2024.2308430>
- Parhoo, K. (1997). *Nursing Research: Principles, Process and Issues*. Macmillan.

- Patel, C. (2013). Use of multimedia technology in teaching and learning communication skills. *International Journal of Advancements in Research Technology*, 2(7), 116-123. <https://www.scribd.com>
- Pavitt, K. (1985). Patent Statistics as Indicators of Innovative Activities: Possibilities and Problems. *Scientometrics*, 7(1), 77-99. <https://doi.org/10.1007/BF02020142>
- Penprase, B.E. (2018). *The Fourth Industrial Revolution and Higher Education*. Macmillan Publications.
- Pinho, J.C., Soares, A.M. (2011). Examining the technology acceptance model in the adoption of social networks. *Journal of Research in Interactive Marketing*, 5(2/3), 116-129. <https://doi.org/10.1108/17505931111187767>
- Pittman, T., Gaines, T. (2015). Technology integration in third, fourth and fifth grade classrooms in a Florida school district. *Educational Technology Research and Development*, 63(1), 539-554. <https://doi.org/10.1007/s11423-015-9391-8>
- Polly, D., Rich, P., Glazer, E.M., & Hannafin, M.J. (2009). Factors and Interactions Influencing Technology Integration During Situated Professional Development in an Elementary School. *Computers in the Schools*, 26(1), 21-39. <https://www.learntechlib.org/p/104724/>.
- Pourhosein Gilakjani, A. (2014). A Detailed Analysis over Some Important Issues towards Using Computer Technology into the EFL Classrooms. *Universal Journal of Education Research*, 2(2), 146-153. <https://doi.org/10.13189/ujer.2014.020206>
- Prasajo, L.D., Mukminin, A., Habibi, A., Marzulina, L., Sirozi, M., & Harto, K. (2018). Learning to teach in a digital age: ICT integration and EFL student teachers' teaching. *Teaching English with Technology*, 18(3), 18-32. <https://www.tewtjournal.org>
- Prasojo, L.D., Habibi, A., Yaakob, M.F.M., Mukminim, A., Hawsindy, S., & Sofwan, M. (2019). An explanatory sequential study on Indonesian principals' perceptions on ICT integration barriers. *The Electronic Journal of e-Learning*, 17(1), 1-10. <https://www.ejel.org>
- Prestridge, S. (2012). The beliefs behind the teacher that influences their ICT practices. *Computers and Education*, 58(1), 449-458. <https://doi.org/10.1016/j.compedu.2011.08.028>

Prestridge, S. (2014). The Beliefs Behind the Teacher That Influences Their ICT Practices. *Computers and Education*, 58(1), 449-458. <https://doi.org/10.1016/j.compedu.2011.08.028>

Price-Rom, A, & Sainazarov, K. (2010). *Active-learning pedagogies as a reform initiative: The case of Kyrgyzstan*. American Institute for Research.

Prince, J. (2017). English Language Learners in a Digital Classroom. *CATESOL Journal*, 29(1), 51-73. <https://eric.ed.gov/id=EJ1144336>

Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society Journal*, 63(4), 655-660. <https://doi.org/10.1079/PNS2004399>

Rahimi, A., & Bigdeli, R.A. (2014). The dynamicity and flexibility of EFL teachers' role identities in language institutes. *ABAC Journal Assumption University*, 34(2), 45-55. <https://www.abacjournal.au.edu>

Ramen, A., & Don, B. (2013)

Ramorola, M. (2013). Challenge of Effective Technology Integration into Teaching and Learning. *Africa Education Review*, 10(4), 654-670. [doi.org/10.1080/18146627.2013.853559](https://doi.org/10.1080/18146627.2013.853559)

Rao, T. B. (2005). *Research methodology*. Paras Publication.

Razak, N.A., Alakrash, H., & Sahboun, S.Y. (2018). English Language Teachers' Readiness for the Application of Technology Towards Fourth Industrial Revolution Demands. *Asia-Pacific Journal of Information Technology and Multimedia*, 7(2), 89-98. [https://doi.org/10.17576/apjitm-2018-0702\(02\)-08](https://doi.org/10.17576/apjitm-2018-0702(02)-08)

Rehm, G., & Hegele, S. (2018). Language Technology for Multilingual Europe: *An Analysis of a Large-Scale Survey regarding Challenges, Demands, Gaps and Needs*. Proceedings of the Eleventh International Conference on Language Resources and Evaluation, Berlin, Germany (pp.3282-3289).

Richardson, C.A., & Rabiee, F. (2001). A Question of Access: An exploration of the factors that influence the health of young males aged 15 to 19 living in Corby and their use of health care services. *Health Education Journal*, 60(1), 3-16. <https://doi.org/10.1177/001789690106000102>

- Moser, K., & Korstjens, I. (2017). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *European Journal of General Practice*, 24(1), 1-10. <https://doi.org/10.1080/13814788.2017.1375091>
- Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General practice*, 24(1), 120-124. <https://doi.org/10.1080/13814788.2017.1375092>
- Mykytn, P.P., Harrison, D.A., & Riemenschneider, C.K. (2003). Understanding IT Adoption Decisions in Small Business: Integrating Current Theories. *Information and Management*, 40(4). [https://doi.org/10.1016/S0378-7206\(02\)00010](https://doi.org/10.1016/S0378-7206(02)00010)
- Sabzian, F., Pourhossein G., A., & Sodouri, S., (2013). Use of technology in the classroom for professional development. *Journal of Language Teaching and Research*, 4(4), 684-692. <https://doi.org/10.4304/jltr.4.4.684-692>
- Sad, S.N., & Acikgul, K. (2020). Mobile Technology Acceptance Scale for Learning Mathematics: Development, Validity, and Reliability Studies. *International Review of Research in Open and Distributed Learning*, 21(4), 161-180. <https://doi.org/10.19173/irrodl.v21i4.4834>
- Safdar, A., Muhammad, I.Y., & Parveen, Q. (2011). Effectiveness of Information and Communication Technology (ICT) In Teaching Mathematics at Secondary Level. *International Journal of Academic Research*, 35(5), 67-72. <http://www.mollymckee.wiki.westga.edu/file/view/Effectiveness+of+ICT+in+Teaching+Mathematics+at+Secondary+Level.pdf>
- Sahal, D. (1981). Alternative conceptions of technology. *Research Policy*, 10(1), 2-24. [https://doi.org/10.1016/0048-7333\(81\)90008-1](https://doi.org/10.1016/0048-7333(81)90008-1)
- Sandelowski, M. (1986). The problem of rigor in qualitative research. *Advances in Nursing Science*, 8(3), 27-37. <https://doi.org/10.1097/00012272-198604000-00005>
- Santana, N.B., Rebelatto, D., Perico, A.E., & Moralles., H.F. (2015). Technological innovation for sustainable development: An analysis of different types of impacts for countries in the BRICS and G7 groups. *International Journal of Sustainable Development and World Ecology*, 22(5), 1-12. <https://doi.org/10.1080/13504509.2015.1069766>

Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research Methods for Business Students*. Pearson Education.

Schul, J.E. (2015). Pedagogical Triangulation: The Mergence of Three Traditions in History Instruction. *The Social Studies*, 106(1), 24-31. <https://doi.org/10.1080/00377996.2014.961184>

Scherer, R., Tondeur, J., Siddiq, F., & Baran, E. (2018). The importance of attitudes toward technology for pre-service teachers' technological, pedagogical, and content knowledge: Comparing Structural Equation Modeling Approaches. *Computers in Human Behaviour*, 80(1), 67-80. <https://doi.org/10.1016/j.chb.2017.11.003>

Scherer, R., Siddiq, F., & Tondeur, I. (2019). The Technology Acceptance Model (TAM): A meta-analytic structural equation modelling approach to explaining teachers' adoption of digital technology in education. *Computers and Education*, 128, 13-35. <https://doi.org/10.1016/j.compedu.2018.09.009>

Selwyn, N. (2011). *Education and Technology: Key Issues and Debates*. Continuum International Publishing.

Serin, H., & Bozdog, F. (2020). Relationship between teachers' attitudes towards technology use in education and autonomy behaviours. *The Turkish Online Journal of Educational Technology*, 19(3), 60-69. <https://eric.ed.gov/?=EJ1261402>

Shannon, C.E., & Weaver, W. (1949). *The Mathematical Theory of Communication*. University of Illinois Press.

Sharma, G. (2017). Pros and Cons of different sampling techniques. *International Journal of Applied Research*, 3(7), 749-752. <https://www.allresearchjournal.com>

Shenton, A.K. (2004). Strategies for Ensuring Trustworthiness in Qualitative Research Projects. *Education for Information*, 22(2), 63-75. <https://doi.org/10.3233/EFI-2004-22201>

Shiowattana, P. (1991). *Transfer of Japanese Technology and Management to the ASEAN countries*. Tokyo Publications.

Shyamlee, S.D., & Phil, M., (2012). *Use of Technology in English Language Teaching and Learning: An analysis in international conference on language, media and culture*. International Conference on Language, Medias and Culture. Singapore (pp150-156).

Siefert, B., Yearta, L., Oliveira, T., & Stover Kelly, K. (2019). Perceptions and Use of Technology Across Content Areas with Linguistically Diverse Middle School Students. *Journal of Digital Learning in Teacher Education*, 35(2), 107-121.

<https://doi.org/10.1080/21532974.2019.1568327>

Silverman, D. (2003). *“Beginning Research”*. *Interpreting Qualitative Data Methods for Analysing Talk, Text and Interaction*. Sage Publications.

Silverman, D. (2010). *Doing Qualitative Research: A practical Handbook*. (3<sup>rd</sup> ed.). Sage Publications.

Simon, M. (2011). Assumptions, Limitations and Delimitations (2011 Ed.). Dissertation Success.

Simons, H. (2009). *Case Study Research in Practice*. Sage Publications.

Soobik, M. (2014). Teaching Methods Influencing the Sustainability of the Teaching Process in Technology Education in General Education Schools. *Journal of Teacher Education for Sustainability* 16(1), 89-101. <https://doi.org/10.2478/jtes-2014-0005>

Spector, J.M. (2016). The potential of smart technologies for learning and instruction. *International Journal of Smart Technology and Learning*, 1(1), 21-32.

<https://doi.org/10.1504/IJSMARTTL.2016.078163>

Srivastava, S., & Dangwal, K.L. (2016). Digital pedagogy in teacher education. *International Journal of Information and Science*, 3(2), 67-72. <https://www.indianjournals.com>

Stark, J. (2020). Dewey’s theory of experience: A theoretical tool for researching music teacher learning. *Action, Criticism, and Theory for Music Education*, 19(1),18-152.

<https://doi.org/10.22176/act19.1.118>

Steyn, H.J., Wolhuter, C.C., Vos, D., & De Beer, Z.L. (2017). *South African Education System: Core characteristics*. Keurkopie.

- Stover, S., Noel, D., McNutt, M., & Heilmann, S.G. (2015). Revisiting Use of Real-Time Polling for Learning Transfer. *Journal of Teaching and Learning with Technology*, 4(1), 40-60. <https://doi.org/10.14434/jotlt.v4n1.13002>
- Sumak, B., Hericko, M., & Pusnik, M. (2011). A meta-analysis of e-learning technology acceptance: The role of user types and e-learning technology types. *Computers in Human Behaviour*, 27(6), 2067-2077. <https://doi.org/10.1016/j.chb.2011.08.005>
- Taiwo, S. (2009). Teachers' Perception of the Role of Media in Classroom Teaching in Secondary Schools. *The Turkish Journal of Educational Technology*, 8(1), 75-83. <http://www.tewtjournal.org>
- Teddle, C., & Yu, F. (2007). Mixed Methods Sampling: A Typology with Examples. *Journal of Mixed Methods Research*, 1(1), 77-100. <https://doi.org/10.1177/1558689806292430>
- Teo, T. (2009). Modelling technology acceptance in education: A study of pre-services teachers. *Computers and Education*, 52(2), 302-312. <https://doi.org/10.1016/j.compedu.2008.08.2006>
- Tihanyi, L., & Roath, A.S. (2002). Technology transfer and institutional development in Central and Eastern Europe. *Journal of World Business*, 37(3), 188-198. [https://doi.org/10.1016/S1090-9516\(02\)00077-9](https://doi.org/10.1016/S1090-9516(02)00077-9)
- Tira, A.C.D.H., Wardana, I.M., & Setiawan, I.P.Y. (2016). Aplikasi Model TAM Pada Penggunaan E-Newspaper di kota Denpasar. *e-Junar!Ekonomi Dan Bisnis Universitas Udayana*, 6(5), 1485-1512.
- Tobin, G.A., & Begley, C.M. (2004). Methodological Rigour within a Qualitative Framework. *Journal of Advanced Nursing*, 48(4), 388-396. <https://doi.org/10.1111/j.1365-2648.2004.03207.x>
- Tokel, S.T., & Isler, V. (2013). Acceptance of virtual worlds as learning space. *Innovations in Education and Teaching International*, 32(1). <https://doi.org/10.1080/14703297.2013.820139>
- Tondeur, J., van Braak, J., Ertmer, P.A., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: a systematic review of qualitative evidence. *Educational Technology Research and Development*, 65(1), 555-575. <https://doi.org/10.1007/s11423-016-9481-2>

Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2020). Enhancing pre-service teachers' technological pedagogical content knowledge (TPACK): A mixed-method study. *Educational Technology Research and Development*, 68(1), 319-343. <https://doi.org/10.1007/s11423-019-09692-1>

Tracy, S.J. (2010). Qualitative Quality: Eight “Big-Tent” Criteria for Excellent Qualitative Research. *Qualitative Inquiry*, 16(10), 837-851. <https://doi.org/10.1177/1077800410328121>

Tymms, P., Arthur, J., Waring, M., Coe, R., & Hedges, L.V. (2012). *Questionnaires. Research methods and methodologies in education*. SAGE Publication.

UNESCO (2005). *Information and Communication Technologies in Schools: A handbook for teachers, or how ICT can create new, open learning environments*. Paris: UNESCO

UNESCO (2009). *2009 World Conference on Higher Education- The New Dynamics of Higher Education and Research for Societal Change and Development*. Paris: UNESCO

UNESCO Institute for Statistics. (2013). *Information and communication technology (ICT) in education in five Arab States: a comparative analysis of ICT integration and e-readiness in schools in Egypt, Jordan, Oman, Palestine and Qatar*. Talal Abu-Ghazaieh Organisation.

Uwasu, M., Yabar, H., Hara, K., & Shimoda, Y. (2009). Educational initiative of Osaka University in sustainability science: Mobilizing science and technology towards sustainability. *Sustainability Science*, 4(1), 45-53. <https://doi.org/10.1007/s11625-009-0066-4>

Vandeyar, T. (2015). Policy Intermediaries and the Reform of e-Education in South Africa. *British Journal of Educational Technology*, 46(2), 344-359. <https://doi.org/10.1111/bjet.12130>

Van de Vlies, R. (2020). *Digital strategies in education across OECD countries: Exploring education policies on digital technologies*. OECD Publishing.

Varoy, E., Lee, K., Luxton-Reilly, A., & Giacaman, N. (2021, June 26- July 1). *Comparing pre-tertiary curricula to investigate the timing of computing exposure* [Paper Presentation]. ACM Conference on Innovation and Technology in Computer Science Education, Germany. <https://doi.org/10.1145/3430665.3456341>

- Vasile, V., Onete, B., & Teodorescu, I. (2016, April 21-22). *Enhancing E-Learning Using Social Media Tools* [Conference Presentation]. The 12<sup>th</sup> International Scientific Conference eLearning and Software for Education, Bucharest. <https://doi.org/10.12753/2066-026X-16-168>
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Journal of Management Science*, 46(2), 186-204. <https://doi.org/10.1287/mnsc.46.2.186.11926>
- Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Research (MIS) Quarterly*, 27(3), 425-478. <https://doi.org/10.2307/30036540>
- Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39(2), 273-315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- Voogt, J. (2012). *ICTs for Curriculum Change*. UNESCO Institute for Information Technologies in Education.
- Wahab, S.A., Rose, R.C., & Osman, S.I.W. (2012). Defining the Concepts of Technology and Technology Transfer: A Literature Analysis. *International Business Research*, 5(1), 61-71. <https://doi.org/10.5539/ibr.v5n1p61>
- Waheed, M., & Jam, F.A. (2010). Teacher's intention to accept online education: Extended TAM model. *Interdisciplinary Journal of Contemporary Research in Business*, 2(5), 344-2010. <https://www.ijcrb.webs.com>
- Wang, S., Ramdani, J.M., & Sun, S. (Alice), Bose, P., & Gao, X. (Andy). (2024). Naming Research Participants in Qualitative Language Learning Research: Numbers, Pseudonyms, or Real Names? *Journal of Language, Identity & Education*, 1-14. <https://doi.org/10.1080/15348458.2023.2298737>
- Wolery, M., Lane, K.L., & Common, E.A. (2018). *Writing tasks: Literature reviews, research proposals, and final reports*. In *Single Case Research Methodology*. Routledge.
- Wong, L-H, Chen, W., Looi, C-K., & Zhang, B. (2010). Students' Personal and Social Meaning Making in a Chinese Idiom Mobile Learning Environment. *Educational Technology and Society*, 13(4), 15-26. <https://www.jstor.org/stable/jeductechsoci.13.issue-4>

Wong, K., Osman, R., Goh, P., & Rahmat, K. (2013). Understanding student teachers' behavioural intention to use technology: Technology Acceptance Model (TAM) Validation and Testing. *International Journal of Instruction*, 6(1), 89-103.

<https://doi.org/10.1108/10650741311288788>

Xing, B., & Marwala, T. (2017). Implications of the Fourth Industrial Age for Higher Education. *The Thinker*, 73(1), 10-15. <https://ssrn.com/abstract=32253331>

Yadav, A., Larimore, R., Rich, K., & Schwarz, C. (2019). *Integrating computational thinking in elementary classrooms: Introducing a toolkit to support teachers*. Proceedings of Society for Information Technology and Teacher Education International Conference. Las Vegas (pp.347-350).

Yeh, R.K.-J., & Teng, J.T.C. (2012). Extended conceptualisation of perceived usefulness: empirical test in the context of information system use continuance. *Behaviour and Information Technology*, 31(5), 525-540. <https://doi.org/10.1080/0144929X.2010.517272>

Yin, R.K. (2011). *Case study research design and methods*. (2<sup>nd</sup> ed.). Sage Publications.

Yin, R.K. (2014). *Case Study Research Design and Methods*. (5<sup>th</sup> ed.). Sage Publications.

Yu, T.K., Lin, M.L., & Liao, Y.K. (2017). Understanding factors influencing information communication technology adoption behaviour: The moderators of information literacy and digital skills. *Computers in Human Behaviour*, 71(1), 196-208. <https://doi.org/10.1016/j.chb.2017.02.005>

Zaineldeen, S., Li, Hongbo., Koffi, L.A., & Mohammed, B. (2020). Technology Acceptance Model Concepts, Contribution, Limitation, and Adoption in Education. *Universal Journal of Educational Research*, 8(11), 5061-5071. <https://doi.org/10.13189/ujer.2020.081106>

Zoch, M., Myers, J., & Belcher, J. (2016). Teachers' engagement with new literacies: Support for implementing technology in the English/language arts classroom. *Contemporary Issues in Technology and Teacher Education*, 17(1), 25-52. <https://www.learntechlib.org/primary/p/151010>

**APPENDIX A**

**OPEN- ENDED QUESTIONNAIRE**

Thank you for agreeing to answer this questionnaire. Please answer it as honestly as possible. There are no 'right' or 'wrong' answers. Please do not add your name to the questionnaire to ensure anonymity. Please write as much as you like in response to the questions posed.

**A) Biographical Information**

**1. Gender:**    Male                       Female

**2. Age Category:**

20s             30s             40s             50s             60s             prefer not to say

**3. Years of teaching experience:**

Less than one year             1-5 years             6-10 years             11-15 years

16-20 years             21-25 years             over 25 years

**4. Currently teaching at level:**

1             2             3

**B) General Attitudes/Experiences of Technology Use in the Classroom**

1. How would you describe your attitudes towards the use of technology when teaching English lessons?

---

---

---

---

---

2. How is technology implementation supported in the school, if at all?

---

---

---

---

---

3. Please indicate what forms of technology are available for you to use at school.

---

---

---

---

4. Please explain your level of comfort in using technology in your English lessons.

---

---

---

---

5. For what aspects of English do you use technology, if at all?

---

---

---

---

6. In an ideal situation, how would you use technology in the English classroom to optimise teaching and learning?

---

---

---

---

7. What are your views on technology use to support and complement English lessons compared to more traditional ways of teaching English?

---

---

---

---

8. As a teacher teaching English in the 21<sup>st</sup> century, please explain how you are providing the knowledge, skills and values to learners so that they leave school with the requirements to succeed outside school?

---

---

---

---

---

9. Learners today have access to many forms of technology. How do you capitalise on this resource in your English classrooms, if at all?

---

---

---

---

---

10. What are the barriers or challenges to integrating technology in your English lessons?

---

---

---

---

---

11. In NOTICE 752 of 2010: Department of Basic Education (DBE) ‘Action Plan to 2014: Towards the Realisation of Schooling 2025’, one of the 13 Goals is “to Increase access amongst learners to a wide range of media, including computers, which enrich their education”. What are your views of that Goal?

---

---

---

---

---

---

---

---

*Thank you for your participation and contribution.*

**APPENDIX B**  
**INDIVIDUAL INTERVIEWS**

**To generate data, I will use two types of interviews that is individual interviews and focus group interviews. Firstly, for the individual interview a schedule will be drawn as part of time frame so that each participant will be available to contribute to the interview. The interview will then be recorded and transcribed verbatim.**

**The following questions will be asked to each participant for the Individual Interview:**

1. Please explain what training you have had in technology use. This could be as a student or as a teacher.
2. Please share what forms of technology you use or have used in your English classrooms.
3. If you have used technology, please share what worked well and what proved problematic.
4. What encourages you to use technology, if at all?

What serves as a barrier to you to use technology?

5. Please explain your experiences (both good and bad) of using technology in your English classrooms.
6. When you use technology in your English classrooms, what are the learners' responses to it? /I know you do not use technology, but if you did, how do you think learners would respond to it?
7. How would you describe your attitude to using technology in the English classroom?
8. What would you say explains your attitude towards technology use?
9. To what extent do you shape your English lessons to include technology?
10. In your opinion, what would be the ideal way that technology may be integrated into English classrooms so as to support teaching and learning?

***Thank you for your participation and contribution.***

## **APPENDIX C**

### **FOCUS GROUP INTERVIEWS**

**For the focus group interview a schedule will be drawn as part of time frame so that all the participants who are involved in the focus group interview will be available to contribute collectively at a time slot that is available to them all. The interview will then be recorded and transcribed verbatim.**

**The following questions will be asked to each participant for the Focus Group Interview:**

1. Please give me details of any training in technology use you may have received as a student or as a teacher? Was it effective training?
2. Please share what forms of technology you use or have used in your English classrooms.
3. If you have used technology, please share what worked well and what proved problematic.
4. What encourages you to use technology and what serves as a barrier?
5. Please explain your experiences (both good and bad) of using technology in your English classrooms.
6. If you do use technology, what are the learners' responses to it, and if you do not, how do you think learners would respond to it?
7. How would you describe your attitude to using technology in the English classroom?
8. What would you say explains your attitude towards technology use?
9. To what extent do you shape your English lessons to include technology?
10. In your opinion, what would be the ideal way that technology may be integrated into English classrooms so as to support teaching and learning?

***Thank you for your participation and contribution.***

## APPENDIX D: ETHICAL CLEARANCE



24 August 2022

**Nerisha Rajbally (213559661)**  
School Of Education  
Edgewood Campus

Dear N Rajbally,

Protocol reference number: HSSREC/00004556/2022

Project title: Technology use in the English classroom: High school teachers' attitudes and experiences

Degree: Masters

### Approval Notification – Expedited Application

This letter serves to notify you that your application received on 05 August 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

**Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.**

This approval is valid until 24 August 2023.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,



Professor Dipane Hlalele (Chair)

/dd

#### Humanities and Social Sciences Research Ethics Committee

Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 260 8350/4557/3587 Email: [hssrec@ukzn.ac.za](mailto:hssrec@ukzn.ac.za) Website: <http://research.ukzn.ac.za/Research-Ethics>

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Washville

**INSPIRING GREATNESS**

## ***APPENDIX E: GATEKEEPER LETTER***

### **LETTER TO THE PRINCIPAL**

4339

25 APRIL 2022

**DEAR PRINCIPAL**

**RE: REQUEST TO CONDUCT RESEARCH**

My name is Miss Nerisha Rajbally and I am a student at the University of KwaZulu-Natal, Edgewood Campus, enrolled for a Masters of Education Degree in Language and Media Studies, request permission to conduct research at your institution. The title of my research is: *Technology Use in the English Classroom: High School Teachers Attitudes and Experiences*

I will request for permission to speak to the English educators at the school. The research will involve me asking questions through the following data collection methods; an interview consisting of individual and focus group as well as an open-ended questionnaire. The purpose of this study is to understand: High school teachers' attitudes and experiences when using technology in the English classroom.

**The objectives of this study is to:**

- To explore what are high school teachers' attitudes and experiences of technology use in their English classrooms.
- To understand why do high school teachers perceive and experience technology use in the way they do.
- To explore how high school English teachers' attitudes and experiences of technology use in the classroom shapes their pedagogical decisions.

Furthermore, I wish to bring to your attention that:

- The identity of the educators will be protected in the report writing and research findings.
- The educators' participation will be voluntary.
- The institution will not be mentioned by its name and pseudonyms will be utilized within this study to protect the identity of the school and its educators.

## ***APPENDIX F: INFORMED CONSENT***

### **LETTER TO THE PROSPECTIVE PARTICIPANT INFORMATION SHEET AND CONSENT FORM**



**UNIVERSITY OF  
KWAZULU-NATAL**  

---

**INYUVESI  
YAKWAZULU-NATALI**

**DEAR: PROSPECTIVE RESEARCH PARTICIPANT**

**RE: REQUEST FOR PERMISSION TO PARTICIPATE IN A RESEARCH STUDY**

#### **1. Nature of the Research Study**

My name is Miss Nerisha Rajbally and I am a Master of Education (Language and Media Studies) student at the University of KwaZulu-Natal, Edgewood Campus. I hereby request you to be a research participant in my research study. The title of my research is:

***“Technology Use in the English Classroom: High School Teachers’ Attitudes and Experiences”***

I know that confidentiality is very important to you. All information that is gathered will be used for the purpose of the research study and will be kept in a safe place at the University of KwaZulu-Natal, Edgewood campus, for a period of five years. Thereafter, the documents containing the research data will be destroyed. Your confidentiality and anonymity are guaranteed. At any given point in time, you can withdraw from the study and will not be penalized for taking such action.

Your involvement is purely for academic purposes only, and there are no financial benefits involved. As a prospective participant, you are invited to engage in the following activities as part of the data generation. The data generation methods utilized will be interviews (focus group and individual) and a semi-structured questionnaire. Moreover, sessions will take

place at a convenient place and time. It will not disrupt your day-to-day functioning at the school and will be conducted out of your instructional time.

As a participant, you may contact the researcher or supervisor. The details are below:

<b>Researcher</b>	<b>Name:</b> Miss Nerisha Rajbally <b>Student Number:</b> 213559661 <b>Current qualification:</b> B. Ed Honours (Language and Media Studies) <b>Pre-qualification:</b> M. Ed - Master of Education (Language and Media Studies)  <b>Email Address:</b> <a href="mailto:rajbally.nerisha@gmail.com">rajbally.nerisha@gmail.com</a> // <a href="mailto:213559661@stu.ukzn.ac.za">213559661@stu.ukzn.ac.za</a>
<b>Supervisor</b>	<b>Name:</b> Professor Ansurie Pillay <b>Qualification:</b> Ph.D. Doctor in Education- Language and Media <b>Contact Number:</b> 031 260 3613 <b>Email Address:</b> <a href="mailto:Pillaya3@ukzn.ac.za">Pillaya3@ukzn.ac.za</a>

In the event of any problems or concerns/questions you may also contact the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

#### **HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION**

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: [HSSREC@ukzn.ac.za](mailto:HSSREC@ukzn.ac.za)

## **2. Requirements of Participant**

The main requirements of the participant are as follows:

- Participation will be voluntary and subject to informed consent.

- A participant is free to withdraw from the research study at any given point in time.
- Rights of a participant will be safeguarded in relation to the preservation of confidentiality, access to research information and findings, and misleading promises regarding the benefits of the research.
- Anonymity and Confidentiality will be ensured through a coding system to avoid the inclusion of personal identifiers. The participant will not be identifiable when the researcher presents his or her findings. Confidentiality will be maintained in storing and disposing of research findings.
- Any information given by you cannot be used against you. The data collected will be used for the purposes of this research only.

**Yours Sincerely,**

**Miss Nerisha Rajbally**



**PARTICIPANT DECLARATION**

I, \_\_\_\_\_ (Full name/s of participant) hereby voluntarily agree to participate in this research study. I confirm that I understand the contents of this document and the nature of the research study. I have been briefed about the nature of the research study by the researcher in advance. I understand that I am at liberty to withdraw from the research study at any time, so should I desire. I also understand that the results of this research study will be used for the purpose of the study only, and that my identity will be kept confidential.

I give permission for the use of the following record devices during the group sessions and data production process:

	<b>Willing</b>	<b>Not willing</b>
<b>Audio recording</b>		
<b>Individual Interview- and transcribed data</b>		
<b>Focus Group Interviews- and transcribed data</b>		
<b>Semi-structured questionnaires- and transcribed data</b>		

\_\_\_\_\_  
**Signature of Participant**

\_\_\_\_\_  
**Date**

## APPENDIX G: TURNITIN ORIGINALITY REPORT

# Turnitin Originality Report

Processed on: 20-May-2024 10:54 AM CAT

ID: 2383894520

Word Count: 52022

Submitted: 1

M.Ed. By Nerisha Rajbally

Similarity Index

11%

### Similarity by Source

Internet Sources:

9%

Publications:

2%

Student Papers:

0%

✘ [Sokhulu, Lerato Hlengiwe.. "Exploring master's students' experiences of using digital technologies in research.", 2021](#)

1% match ()

✘ [Pillay, Lucas.. "Teachers' understanding of Attention Deficit Hyperactivity Disorder in public primary mainstream classrooms: a narrative inquiry.", 2020](#)

1% match (Internet from 08-Sep-2017)

✘ <http://uir.unisa.ac.za>

1% match (Internet from 19-Apr-2024)

✘ <https://act.maydaygroup.org/volume-19-issue-1/deweys-theory-of-experience-a-theoretical-tool-for-researching-music-teacher-learning/>

1% match (Internet from 12-Sep-2022)

✘ <https://files.eric.ed.gov/fulltext/EJ1232057.pdf>

<1% match (Internet from 02-Oct-2022)

✘ [https://researchspace.ukzn.ac.za/bitstream/handle/10413/19133/Mlilo\\_Thobekile\\_2019.pdf?isAllowed=y&sequence=1](https://researchspace.ukzn.ac.za/bitstream/handle/10413/19133/Mlilo_Thobekile_2019.pdf?isAllowed=y&sequence=1)

<1% match (Internet from 26-Aug-2021)

✘ [https://researchspace.ukzn.ac.za/jspui/bitstream/10413/15388/1/Anyanwu\\_Munachiso\\_A\\_2016.pdf](https://researchspace.ukzn.ac.za/jspui/bitstream/10413/15388/1/Anyanwu_Munachiso_A_2016.pdf)

<1% match ()

✘ [Coetzee, Morne Johan James.. "Factors affecting fluctuating language results at matriculation level: how principals at ten schools in the Harry Gwala district of Kwazulu-Natal explain the phenomenon.", 2022](#)

<1% match ()

✘ [Peter, Sweetlina Nomonde.. "Lecturers and students' views of integrating technology in the fashion curriculum.", 2019](#)

<1% match ()

✘

***APPENDIX H: EDITORS LETTER***

**PRO EDIT PTY LTD**

PO BOX 23081, CLAREMONT CAPE TOWN 7735 | +27 21 813 6997

**EDITING CERTIFICATE**

Date: 2024/06/17

**This serves to confirm that the document entitled:**

**Technology Use in the English Classroom: High School Teachers' Attitudes and Experiences**

**A Dissertation submitted to the School of Education of the University of KwaZulu-Natal in fulfilment of the requirements for the degree of Master of Education**

**by**

**NERISHA RAJBALLY  
213559661**

**has been language edited on behalf of its author.**

**Genevieve Wood  
PhD candidate  
Wits University**