

**Factors influencing secondary school teachers' behavioural intentions to  
accept the use of WhatsApp for emergency remote teaching in Mopani District  
Limpopo Province**

by

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## DECLARATION

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

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

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

  
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## **ABSTRACT**

Using WhatsApp for emergency remote teaching has proven to be effective in emergency remote teaching pandemic. However, some teachers are hesitant to accept and use WhatsApp for emergency remote teaching for reasons arising from various factors. This study extended and applied the Unified Theory of Acceptance and Use of Technology 2 to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for emergency remote teaching in the Namakgale Circuit in the Limpopo province of South Africa. Understanding the factors that influence teachers' behavioural intention to accept and use WhatsApp for emergency remote teaching is key to successful implementation of emergency remote teaching using WhatsApp. Data were collected quantitatively using an online anonymous questionnaire from a convenient sample of 215 teachers from seven secondary schools in the Namakgale Circuit. Descriptive statistics using the Statistical Package for the Social Sciences version 28 and covariance-based structural equation modelling using Analysis of Moment Structures version 28 were employed to analyse the data. The results revealed that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy significantly influence behavioural intention to accept and use WhatsApp for emergency remote teaching, while attitude towards use and personal innovativeness do not significantly influence behavioural intention to accept and use WhatsApp for emergency remote teaching. Surprisingly, habit was the best factor predicting behavioural intention to accept and use WhatsApp for emergency remote teaching. It is recommended that schools and the Department of Basic Education strengthen the factors that influence teachers' behavioural intentions to accept and use WhatsApp for emergency remote teaching and ensure that they are met to enhance teachers' acceptance and use of WhatsApp for emergency remote teaching.

**Key terms:** COVID-19, digital learning platforms, emergency remote teaching, online learning, pandemic, secondary school teachers, social media platforms, UTAUT2 WhatsApp.

## NKOMISO

Ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla swi kombisile ku va leswi pfunaka eka ku tiyisisa ku ya emahlweni ka dyondzo hi nkarhi wa ku pfariwa ka swikolo hikwalaho ka ntungu wa COVID-19. Hambiswiritano, vadyondzisi van'wana va kanakana ku amukela na ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla hi swivangelo leswi tumbulukaka ku suka eka timhaka to hambanahambana. Dyondzo leyi yi engeterile/lehisile na ku tirhisa Unified Theory of Acceptance na ku Tirhisa Technology 2 ku lavisisa timhaka leti kucetelaka xikongomelo xa mahanyelo ya vadyondzisi va xikolo xa sekondari xo amukela na ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla eka Sekhete ya Namakgale eka xifundzakulu xa Limpopo eAfrika Dzonga. Ku twisisa timhaka leti kucetelaka xikongomelo xa mahanyelo ya vadyondzisi xo amukela na ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla i swa nkoka eka ku simekiwa hi ndlela yo humelela madyondziselo ya le kule ya xihatla hi ku tirhisa WhatsApp. Dataro yi hlengeletiwile hi ndlela ya nhlayo hi ku tirhisa nongonoko wa swivutiso swa online leswi nga tivekeku ku suka eka sampulu leyi olovaka ya 215 wa vadyondzisi vo huma eka swikolo swa kombo swa sekondari eka Sekhete ya Namakgale. Tihlayonhlayo leti hlamuselaka hi ku tirhisa Phakeji ya Tihlayonhlayo ta Sayense ya Vanhu ya vhexini ya 28 na maendlelo yo hambanahambana lama kongomisaka eka ku pima ku hambana hi ku tirhisa Nxopaxopo wa Swivumbeko swa Nkarhi vhexini ya 28 swi tirhisiwile ku xopaxopa datara. Mbuyelo wu humeserile erivaleni leswaku ku languteriwa ka matirhelo, ku languteriwa ka matshalatshala, nkucetelo wa vanhu, swiyimo swo olovisa, nsusumeto wo enerisa, nkoka wo dyondzisa, ntolovelo na vutitshembhi swi kucetela hi ndlela ya nkoka xikongomelo xa mahanyelo yo amukela na ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla, loko mavonelo ehenhla ka ku tirhisa vutumbuluxi bya munhu hi yexe ya nga kuceteli xikongomelo xa mahanyelo yo amukela na ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla. Xo hlarisa, ntolovelo a ku ri yona mhaka leyi vhumbheke xikongomelo xa mahanyelo yo amukela na ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla. Swa bumabumeriwa leswaku swikolo na Ndzawulo ya Dyondzo ya le Hansi swi tiyisisa timhaka leti kucetelaka xikongomelo xa mahanyelo ya vadyondzisi yo amukela ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla na ku tiyisisa leswaku swa fikeleriwa ku tlakusa

ku amukela ka vadyondzisi na ku tirhisa WhatsApp eka madyondziselo ya le kule ya xihatla.

**Matheme ya nkoka:** COVID-19, tipulatifomo to dyondza ta xidijiti, madyondziselo ya le kule ya xihatla, ku dyondza eka online, ntungu, vadyondzisi va xikolo xa sekondari, tipulatifomo ta mediya ya vanhu, UTAUT2, WhatsApp.

## KAKARETŠO

Go šomiša WhatsApp go thuto ya rimoute ya tšhoganetšo go ipontšhitše gore go šoma gabotse go kgonthiša tšwelopele ya thuto nakong ya go tswalelwa ga dikolo ka lebaka la leuba la COVID-19. Le ge go le bjalo, barutiši ba bangwe ba sa dikadika go amogela le go šomiša WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo ka mabaka a go fapafapana. Nyakišišo ye e okeditše le go šomiša Teori ye e Kopantšwego ya Kamogelo le Tšhomišo ya Theknolotši 2 go nyakišiša mabaka ao a huetšago maikemišetšo a boitshwaro bja barutiši ba dikolo tša sekontari a go amogela le go šomiša WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo ka Tikologong ya Namakgale ka profentsheng ya Limpopo ka Afrika Borwa. Go kwešiša mabaka ao a huetšago maikemišetšo a boitshwaro bja barutiši a go amogela le go šomiša WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo go bohlokwa go phethagatšo ye e atlegilego ya thuto ya rimoute ya tšhoganetšo ka go šomiša WhatsApp. Datha e kgobokeditšwe ka mokgwa wa khwanthithethifi ka go šomiša lenaneopotšišo la inthanete leo le se nago leina go tšwa go sampole ye lego maleba ya barutiši ba 215 go tšwa dikolong tše šupa tša sekontari ka Tikologong ya Namakgale. Dipalopalo tše di hlalošago ka go šomiša mohuta wa 28 wa Phaketše ya Dipalopalo ya Disaense tša Leago le go dira mmotlolo wa tekano ya sebopego woo o theilwego godimo ga kamano ka go šomiša mohuta wa 28 wa Tshekatsheko ya Dibopego tša Potlako di šomišitšwe go sekaseka datha. Dipelo di utulotše gore tetelo ya mošomo, tetelo ya maitapišo, khuetšo ya leago, maemo a kgonagatšo, tlhohleletšo ya lethabo, boleng bja go ruta, setlwaedi le boitshepho di huetša kudu maikemišetšo a boitshwaro a go amogela le go šomiša WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo, mola maikutlo a go šomiša le boitlhamelo bja motho ka noši ga a huetše kudu maikemišetšo a boitshwaro a go amogela le go šomiša WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo. Se se makatšago, setlwaedi e be e le selo se sebotse kudu seo se bonelagopele maikemišetšo a boitshwaro a go amogela le go šomiša WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo. Go šišinywa gore dikolo le Kgoro ya Thuto ya Motheo di matlafatše mabaka ao a huetšago maikemišetšo a boitshwaro bja barutiši a go amogela le go šomiša WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo le go kgonthiša gore a fihlelelwa go godiša kamogelo ya barutiši le tšhomišo ya WhatsApp go phethagatša thuto ya rimoute ya tšhoganetšo.

**Mareo a bohlokwa:** COVID-19, dipolatefomo tša go ithuta tša ditšithale, thuto ya rimoute ya tšhoganetšo, go ithuta ka inthanete, leuba, barutiši ba dikolo tša sekontari, dipolatefomo tša bobegaditaba tša leago, UTAUT2, WhatsApp.



## TABLE OF CONTENTS

<b>DECLARATION</b> .....	<b>i</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>ii</b>
<b>ABSTRACT</b> .....	<b>iii</b>
<b>NKOMISO</b> .....	<b>iv</b>
<b>KAKARETŠO</b> .....	<b>vi</b>
<b>TABLE OF CONTENTS</b> .....	<b>viii</b>
<b>LIST OF TABLES</b> .....	<b>xiii</b>
<b>LIST OF FIGURES</b> .....	<b>xiv</b>
<b>TABLE OF ABBREVIATIONS AND ACRONYMS</b> .....	<b>xv</b>
<b>CHAPTER 1: INTRODUCTION AND BACKGROUND</b> .....	<b>1</b>
1.1 INTRODUCTION.....	1
1.2 BACKGROUND TO THE STUDY .....	1
1.3 CONTEXT OF THE STUDY.....	4
1.4 RATIONALE FOR THE STUDY .....	5
1.5 PROBLEM STATEMENT.....	7
1.5.1 Research question.....	9
1.5.2 Aim and objectives.....	9
1.5.3 Hypotheses.....	10
1.6 ASSUMPTIONS OF THE STUDY .....	11
1.7 PRELIMINARY LITERATURE REVIEW .....	11
1.7.1 Overview of emergency remote teaching .....	11
1.7.2 The use of WhatsApp for emergency remote teaching .....	12
1.8 BRIEF INTRODUCTION TO THEORETICAL FRAMEWORK .....	13
1.9 RESEARCH METHODOLOGY AND DESIGN.....	15
1.9.1 Research paradigm .....	15
1.9.2 Research approach .....	16
1.9.3 Research design.....	17
1.9.4 Population and sampling.....	17
1.9.5 Data collection instrument.....	18
1.9.6 Data analysis .....	20
1.10 RELIABILITY AND VALIDITY .....	20

1.11 RESEARCH ETHICS .....	22
1.12 DELIMITATIONS OF THE STUDY .....	22
1.13 DEFINITION OF KEY CONCEPTS.....	22
1.14 CHAPTER OUTLINE .....	24
1.15 SUMMARY.....	25
<b>CHAPTER 2: THEORETICAL FRAMEWORK .....</b>	<b>27</b>
2.1 INTRODUCTION .....	27
2.2 OVERVIEW OF MODELS AND THEORIES OF TECHNOLOGY ACCEPTANCE .....	27
2.2.1 The theory of reasoned action .....	29
2.2.2 The theory of planned behaviour .....	30
2.2.3 The Technology Acceptance Model.....	31
2.2.4 The Combined Technology Acceptance Model and theory of Planned Behaviour .....	34
2.2.5 The Motivational Model.....	35
2.2.6 The Model of Personal Computer Utilisation.....	36
2.2.7 Social cognitive theory .....	38
2.2.8 Innovation diffusion theory .....	39
2.2.9 Unified Theory of Acceptance and Use of Technology .....	41
2.2.10 The Unified Theory of Acceptance and Use of Technology 2 .....	42
2.3 PROPOSED EXTENSION OF THE UTAUT2 AND HYPOTHESES .....	48
2.3.1 Performance expectancy .....	49
2.3.2 Effort expectancy .....	52
2.3.3 Social influence.....	53
2.3.4 Facilitating conditions .....	54
2.3.5 Hedonic motivation .....	56
2.3.6 Teaching value .....	57
2.3.7 Habit .....	59
2.3.8 Attitude towards use .....	60
2.3.9 Personal innovativeness .....	61
2.3.10 Self-efficacy .....	63
2.3.11 Behavioural intention .....	64
2.4 SUMMARY.....	65
<b>CHAPTER 3: LITERATURE REVIEW .....</b>	<b>66</b>

3.1 INTRODUCTION .....	66
3.2 BACKGROUND OF EMERGENCY REMOTE TEACHING.....	66
3.3. EMERGENCY REMOTE TEACHING INITIATIVES BY DEVELOPED AND DEVELOPING COUNTRIES.....	70
3.3.1 Emergency remote teaching initiatives by developing countries.....	70
3.3.2 Emergency remote teaching initiatives by developed countries.....	83
3.3.3 Discussion of the emergency remote teaching initiatives by developed and developing countries.....	90
3.4 CHALLENGES FACED BY TEACHERS DURING THE TRANSITION TO EMERGENCY REMOTE TEACHING .....	92
3.5 BENEFITS OF EMERGENCY REMOTE TEACHING FOR TEACHERS.....	94
3.6 OVERVIEW OF WHATSAPP.....	95
3.6.1 Educational affordances of WhatsApp.....	95
3.7 WHATSAPP AS A PLATFORM FOR EMERGENCY REMOTE TEACHING ..	98
3.7.1 Benefits of using WhatsApp for emergency remote teaching .....	100
3.7.2 Disadvantages of using WhatsApp for emergency remote teaching.....	103
3.8 SUMMARY.....	105
<b>CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY.....</b>	<b>106</b>
4.1 INTRODUCTION .....	106
4.2 RESEARCH PARADIGM .....	107
4.3 APPROACH TO THEORY DEVELOPMENT .....	109
4.4 RESEARCH APPROACH.....	110
4.5 RESEARCH DESIGN .....	111
4.6 POPULATION AND SAMPLING.....	112
4.6.1 Population.....	113
4.6.2 Sampling.....	113
4.7 DATA COLLECTION METHOD .....	114
4.7.1 The design and structure of the online questionnaire .....	116
4.7.2 Dissemination of the online questionnaire .....	118
4.7.3 Time horizon .....	119
4.8 DATA ANALYSIS.....	119
4.8.1 Descriptive statistical analyses .....	119
4.8.2 Structural equation modelling analysis .....	120
4.9 VALIDITY AND RELIABILITY .....	121

4.9.1 Validity .....	121
4.9.2 Reliability .....	124
4.10 PILOT STUDY .....	125
4.11 ETHICAL CONSIDERATIONS.....	127
4.11.1 Permission to conduct the research.....	127
4.11.2 Informed consent and voluntary participation .....	128
4.11.3 Confidentiality and anonymity .....	128
4.12 SUMMARY.....	128
<b>CHAPTER 5: RESEARCH RESULTS AND DISCUSSION .....</b>	<b>130</b>
5.1 INTRODUCTION .....	130
5.2 EXAMINATION FOR POSSIBLE COMMON METHOD BIAS.....	131
5.3 DATA SCREENING AND CLEANING .....	132
5.3.1 Unengaged responses.....	133
5.3.2 Missing data.....	133
5.3.3 Outliers .....	134
5.3.4 Multicollinearity .....	137
5.3.5 Normality.....	138
5.4 RESPONSE RATE .....	140
5.5 DESCRIPTIVE STATISTICS .....	141
5.5.1 Demographical information of the respondents .....	141
5.5.2 Descriptive statistics of the constructs of the extended UTAUT2.....	144
5.6 RELIABILITY.....	161
5.7 THE LEVEL OF ACCEPTANCE AND USE OF WHATSAPP FOR EMERGENCY REMOTE TEACHING IN THE NAMAKGALE CIRCUIT.....	162
5.8 SAMPLING ADEQUACY .....	164
5.9 STRUCTURAL EQUATION MODELLING ANALYSIS.....	165
5.9.1 Assessment of the measurement model.....	166
5.9.2 Assessment of the structural model.....	168
5.10 SUMMARY.....	188
<b>CHAPTER 6: CONCLUSION AND RECOMMENDATIONS.....</b>	<b>190</b>
6.1 INTRODUCTION .....	190
6.2 OVERVIEW OF THE RESEARCH.....	192
6.3 SUMMARY OF KEY RESEARCH RESULTS .....	194
6.3.1 Hypotheses testing .....	194

6.3.2 Main research question .....	195
6.3.3 Research sub-question 1 .....	196
6.3.4 Research sub-question 2 .....	196
6.3.5 Research sub-question 3 .....	197
6.3.6 Research sub-question 4 .....	197
6.4 CONTRIBUTIONS OF THE STUDY .....	197
6.4.1 Contributions to theory .....	198
6.4.2 Contributions to methodology .....	200
6.5 PRACTICAL IMPLICATIONS.....	200
6.6 RECOMMENDATIONS.....	204
6.6.1 Recommendations to the Department of Basic Education.....	204
6.6.2 Recommendations to the schools.....	204
6.7 LIMITATIONS OF THE STUDY .....	204
6.8 SUGGESTIONS FOR FUTURE RESEARCH.....	205
6.9 CONCLUSION .....	206
<b>REFERENCES.....</b>	<b>208</b>
<b>APPENDICES .....</b>	<b>286</b>
Appendix A: Questionnaire .....	286
Appendix B: Section B measurement items .....	292
Appendix C: Ethical clearance certificate .....	296
Appendix D: Permission granted by the Limpopo Research Committee.....	298
Appendix E: Letter to Mopani District Director requesting for permission .....	299
Appendix F: Permission granted by Mopani District Director .....	300
Appendix G: Letter to Lulekani Circuit Manager requesting for permission .....	302
Appendix H: Letter to Namakgale Circuit Manager requesting for permission ....	303
Appendix I: Permission granted by Lulekani Circuit Manager .....	304
Appendix J: Permission granted by Namakgale Circuit Manager .....	305
Appendix K: Letter to the school principals requesting for permission .....	306
Appendix L: Permission granted by the school principals .....	307
Appendix M: Language editor's letter.....	316
Appendix N: Turnitin report .....	317

## LIST OF TABLES

Table 4.1: Results of Cronbach's alpha.....	126
Table 5.1: Univariate outliers.....	135
Table 5.2: Multivariate outliers .....	136
Table 5.3: Multicollinearity test results.....	137
Table 5.4: Results of skewness and kurtosis tests.....	140
Table 5.5: Gender distribution of respondents .....	142
Table 5.6: Respondents' highest educational qualification.....	144
Table 5.7: Frequency distribution of performance expectancy items .....	145
Table 5.8: Frequency distribution of effort expectancy items .....	146
Table 5.9: Frequency distribution of social influence items .....	148
Table 5.10: Frequency distribution of facilitating conditions items.....	149
Table 5.11: Frequency distribution of hedonic motivation items.....	151
Table 5.12: Frequency distribution of teaching value items.....	152
Table 5.13: Frequency distribution of habit items.....	154
Table 5.14: Frequency distribution of attitude towards use items.....	155
Table 5.15: Frequency distribution of personal innovativeness items .....	157
Table 5.16: Frequency distribution of self-efficacy items.....	158
Table 5.17: Frequency distribution of behavioural intention items.....	160
Table 5.18: Results of Cronbach's alpha.....	161
Table 5.19: Level of acceptance and use of WhatsApp for ERT .....	163
Table 5.20: Results of KMO and Bartlett's test of sphericity.....	165
Table 5.21: Results of convergent validity.....	166
Table 5.22: Construct correlation matrix.....	168
Table 5.23: Results of the fit indices .....	171
Table 6.1: Summary of the results of hypotheses testing.....	195

## LIST OF FIGURES

Figure 2.1: The TRA (adapted from Fishbein & Ajzen, 1975).....	29
Figure 2.2: The TPB (Ajzen, 1991).....	31
Figure 2.3: The original TAM (Davis, 1986).....	32
Figure 2.4: First modified version of the TAM (Davis et al., 1989).....	33
Figure 2.5: The C-TAM-TPB (Taylor & Todd, 1995).....	34
Figure 2.6: The MM (Cocosila et al., 2009) .....	36
Figure 2.7: The MPCU (Thompson et al., 1991) .....	37
Figure 2.8: SCT (Bandura, 1986) .....	39
Figure 2.9: IDT (Rogers, 1995) .....	40
Figure 2.10: The UTAUT (Venkatesh et al., 2003) .....	41
Figure 2.11: The UTAUT2 (Venkatesh et al., 2012) .....	44
Figure 2.12: Proposed extension of the UTAUT2 and hypotheses .....	49
Figure 5.1: Age distribution of respondents .....	143
Figure 5.2: Respondents' experience with using WhatsApp for ERT .....	143
Figure 5.3: Steps for evaluating the structural model .....	169
Figure 5.4: Results of path analysis of the proposed extension of the UTAUT2 ....	173
Figure 5.5: Final proposed extension of UTAUT2 with standardised beta coefficients and coefficient of determination ( $R^2$ ) .....	186

## TABLE OF ABBREVIATIONS AND ACRONYMS

AMOS	Analysis of moment structures
AVE	Average variance extracted
BMBWF	<i>Bundesministerium für Bildung, Wissenschaft und Forschung</i>
CB-SEM	Covariance-based structural equation modelling
CFA	Confirmatory factor analysis
CFI	Comparative fit index
C-TAM-TPB	Combined technology acceptance model and theory of planned behaviour
DBE	Department of Basic Education
DIKSHA	Digital infrastructure for knowledge sharing
EBA	<i>Eğitim Bilişim Ağı</i>
EFL	English as a foreign language
ERT	Emergency remote teaching
GIF	Graphics interchange format
ICT	Information and communication technology
IDT	Innovation diffusion theory
IFI	Incremental fit index
INTEF	Institute of Educational Technologies and Teacher Training
IS	Information system
IT	Information technology
KMO	Kaiser-Meyer-Olkin
LMS	Learning management system
MEVT	Ministry of Education and Vocational Training
MM	Motivational model
MoNE	Ministry of National Education
MOOC	Massive open course
MoPSE	Ministry of Primary and Secondary Education
MPCU	Model of personal computer utilisation
NCERT	National Council of Educational Research and Training
NFI	Normed fit index
NGO	Non-governmental organisation
NROER	National Repository of Open Educational Resources
PC	Personal computer
PEP	People's Education Press



PLS-SEM	Partial least squares structural equation modelling
R <sup>2</sup>	Coefficient of determination
REB	Rwanda Education Board
RMSEA	Root mean square error of approximation
SABC	South African Broadcasting Corporation
SCT	Social cognitive theory
SEM	Structural equation modelling
SPSS	Statistical package for the social sciences
SRMR	Standardised root mean square residual
STEM	Science, technology, engineering and mathematics
SWAYAM	Study Webs of Active Learning for Young-Aspiring Minds
TAM	Technology acceptance model
TLI	Tucker-Lewis index
TPB	Theory of planned behaviour
TRA	Theory of reasoned action
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
USSD	Unstructured supplementary service data
UTAUT	Unified theory of acceptance and use of technology
UTAUT2	Unified theory of acceptance and use of technology 2
VIF	Variance inflation factor
ZIMSEC	Zimbabwe School Examinations Council

# CHAPTER 1

## INTRODUCTION AND BACKGROUND

### 1.1 INTRODUCTION

This chapter provides an introduction and background to the study. It outlines the rationale for the study, the problem statement, the research questions, the aim and objectives of the study, and the hypotheses. Additionally, it provides a brief introduction to literature and a theoretical framework. This chapter also provides a brief description of the research methodology and design for this study, including the study population and sampling strategy, method of data collection, data analysis procedures, reliability and validity, and ethical considerations. Furthermore, the chapter outlines the assumptions and delimitations of the study as well as the definitions of key concepts. Finally, the chapter provides an outline of the chapters.

### 1.2 BACKGROUND TO THE STUDY

In March 2020, the World Health Organization (2020) proclaimed Covid-19 a global pandemic and issued a warning about its potential spread. Consequently, many countries around the world implemented stringent rules to limit and stop the spread of Covid-19, including lockdowns, curfews and physical distancing regulations (Alshammari, 2021; Bozkurt & Sharma, 2020). In South Africa, the government declared a nationwide lockdown in March 2022, forcing the Department of Basic Education (DBE) to close all primary and secondary schools. The South African education system at the primary and secondary levels is designed for face-to-face instruction. The closure of schools affected approximately 13 million learners and 380 000 teachers (*Mail & Guardian*, 2020). Following the recommendation by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO), the DBE encouraged all teachers to implement emergency remote teaching (ERT) to ensure the continuity of teaching and learning (Chirinda et al., 2021). This abrupt switch to ERT raised many questions in the education sector, such as teachers' attitude towards using digital learning platforms for ERT and their level of acceptance and use of the digital learning platforms for ERT (Tiwari et al., 2022).

Furthermore, the sudden transition to ERT caught the teachers by surprise, especially those who had never used digital tools for teaching before (Ciftci et al., 2023). In a

short period, teachers had to use various learning management systems (LMSs) and instant messaging applications to implement ERT (Sleeman et al., 2020; Zelinskiy, 2020). However, Bervell and Umar (2020) observed that the use of LMSs for ERT is more prevalent in higher education institutions than in secondary schools, as they are expensive and require substantial training. Paynter and Barnes (2021) contend that LMSs are very expensive to license, and public schools cannot afford to purchase and maintain them. Therefore, the use of instant messaging applications for ERT has become common at school level due to their ease of use, affordability and availability (Muthmainnah, 2020). One such application is WhatsApp Messenger, popularly known as “WhatsApp”, which was the most used platform for ERT by teachers, especially those in public secondary schools (Muthmainnah, 2020).

WhatsApp is a free messaging application that runs on various platforms (Chirinda et al., 2021). It is the most well-known instant messaging application, with about 1.5 billion users worldwide (Iqbal, 2020). In South Africa, it is used by 58% of smartphone users for different purposes (Statista, 2021a). Although there is a WhatsApp application for computers, it does not have the same popularity as the WhatsApp app for smartphones (Ujakpa et al., 2018). The reason for the popularity of the smartphone WhatsApp app could be attributed to the fact that smartphones are commonly owned and used information and communication technology (ICT) tools due to their portability and affordability (Dunaway & Soroka, 2021; Misra et al., 2020; Ta’amneh, 2021).

The massive adoption of WhatsApp for ERT in public secondary schools is attributed to its perceived advantages (Chirinda et al., 2021). The uniqueness of using WhatsApp for ERT is that it is user-friendly and accessible compared to other platforms used to implement ERT (Amin & Sundari, 2020). Maphosa et al. (2020) contend that using WhatsApp for ERT requires little or no training. Despite the considerable advantages of using WhatsApp for ERT, some teachers are reluctant to accept and use it for ERT (Suryana et al., 2021). Various factors influence teachers’ decision to use or not use WhatsApp for ERT. Knowing and understanding the factors influencing teachers’ decision to use or not to use WhatsApp for ERT is critical for successful implementation of using WhatsApp for ERT. Furthermore, it is important to comprehend the factors that influence teachers’ decisions to accept and use WhatsApp for ERT, particularly in South Africa as a developing country that was caught off guard by the rapid switch from face-to-face instruction to ERT.

The current study investigated the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit in South Africa. While factors that influence behavioural intention to accept and use technologies are diverse and investigated using various technology acceptance models and theories, the present study adopted the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), proposed by Venkatesh et al. (2012), as a guiding theoretical framework. The UTAUT2 is the most widely applied theory to probe the factors that influence individuals' behavioural intentions to accept and use various technologies in different domains (Araújo et al., 2021; Azizi et al., 2020). The UTAUT2 comprises the constructs of performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation and habit as determinants of behavioural intention to use technology (Venkatesh et al., 2012). Many studies investigating technology acceptance have suggested that increasing the number of constructs in the UTAUT2 enhances its ability to predict users' acceptance of technology (Arain et al., 2019; Cheng et al., 2020; Shaw & Sergueeva, 2019). Many constructs have been recommended in the literature to complement the applicability of the UTAUT2 in educational settings (Chao, 2019).

In this study, the UTAUT2 was extended by replacing the price value construct with a new construct introduced by this study, namely the teaching value construct, and adding three additional constructs, namely attitude towards use (Davis et al., 1989), personal innovativeness (Agarwal & Prasad, 1998) and self-efficacy (Compeau & Higgins, 1995), as predictors of behavioural intention to accept and use WhatsApp for ERT. This study replaced the construct of price value because it was considered less important, as teachers do not bear any direct monetary costs for using WhatsApp for ERT. Furthermore, the constructs of attitude towards use, personal innovativeness and self-efficacy were considered important and suitable for this study, because other studies have used them to probe the factors influencing teachers' behavioural intentions to accept and use various technologies for teaching. For example, attitude towards use was added to the UTAUT2 by Ateş and Garzón (2022) to investigate the variables influencing teachers' behavioural intention to accept and use augmented reality for teaching science courses. Mahamud et al. (2021) included personal innovativeness to probe the factors influencing teachers' behavioural intention to accept and use Google Classroom as a platform for teaching and learning. A study by

Nikolopoulou et al. (2021) included self-efficacy to investigate the factors influencing teachers' behavioural intention to use mobile internet in the teaching and learning process.

Moreover, this study included the constructs of attitude towards use, personal innovativeness and self-efficacy in the UTAUT2, because the constructs are considered critical when investigating the factors that influence technology acceptance in educational contexts (Arain et al., 2019; Cheng et al., 2020). Even though these constructs are considered critical when investigating the factors influencing technology acceptance in educational contexts, studies incorporating them into a single theory or model of technology acceptance are relatively hard to find (Arain et al., 2019; Chao, 2019; Cheng et al., 2020). To the researcher's best knowledge, no previous studies have considered constructs of teaching value, attitude towards use, personal innovativeness and self-efficacy in one technology acceptance model or theory for any study in South African context. Therefore, the main theoretical contribution of this study is the extension and application of the UTAUT2 to the unique context of using WhatsApp for ERT.

### **1.3 CONTEXT OF THE STUDY**

The context of the present study was the Namakgale Circuit. The Namakgale Circuit is located in the Namakgale township outside Phalaborwa in the Mopani District in Limpopo province, South Africa. The circuit consists of thirteen primary and seven secondary schools. This study was conducted in all seven secondary schools. The DBE suggested and encouraged teachers to implement ERT using WhatsApp to ensure the continuity of education during the pandemic (Nkambule, 2023). However, the implementation of ERT using WhatsApp was very low at all the secondary schools in the Namakgale Circuit (Namakgale Circuit, 2020). Furthermore, all these secondary schools are no-fee schools and rely on government for resources. In addition, all the secondary schools have a Wi-Fi system and a computer laboratory with ICT devices such as computers and laptops. However, the available ICT devices in each computer laboratory are not enough for the learners who use them. Furthermore, the seven secondary schools are in Quintile 3, with each school having an enrolment of over 500 learners and over 20 teachers. At the time of writing this thesis, learners from the secondary schools in the Namakgale Circuit attended traditional classroom lessons

on a rotational basis due to high enrolment in the schools and the need to comply with Covid-19 regulations.

The DBE (2020a) proposed three Covid-19 schooling models that schools may follow to ensure that all learners are taught at school while adhering to Covid-19 regulations, namely bi-weekly rotational attendance, alternating days per week and a platooning system. According to the DBE (2020a), bi-weekly rotational attendance implies that learners attend school in groups or grades on alternating weeks. Alternating days per week is when grades or groups of learners exchange attendance at classes on various days of the week (DBE, 2020a). Platooning is described as a schooling system in which the same school building is used by two groups of learners and teachers, one in the morning and the other in the afternoon (DBE, 2020a). Depending on its circumstances, each secondary school adopted a specific schooling model. Moreover, in days where learners do not go to school, they would still receive their lessons through WhatsApp.

#### **1.4 RATIONALE FOR THE STUDY**

WhatsApp is the most popular instant messaging application used in educational settings by teachers (Gon & Rawekar, 2017; Napratilora et al., 2020). Motiwalla (2014) asserts that its popularity among teachers is excellent and that it would be foolish to ignore it in any teaching environment and suggests that researchers start investigating how it can be used for teaching. Although several studies have been conducted to investigate the use of WhatsApp in educational settings (Amelia, 2020; Baishya & Maheshwari, 2020; Oriji & Anikpo, 2019; Sharma, 2020), little research has been conducted to understand the elements influencing teachers' behavioural intention to accept and use WhatsApp for teaching (Ujakpa et al., 2018). WhatsApp has been recommended and suggested as the platform for ERT for schools in quintiles 1 to 3 to ease of use and accessibility by the DBE. However, its implementation as a platform for ERT was very low the secondary schools in the Namakgale Circuit schools (Namakgale Circuit, 2020). Therefore, investigating the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit is noteworthy. Aguilera-Hermida et al. (2021) assert that the factors influencing behavioural intention to accept and use technology, particularly for ERT, are a topic of great interest. In addition, because WhatsApp has been a popular

platform for implementing ERT in secondary schools (Mpungose, 2020; Tanga et al. 2020) and teachers' acceptance play an essential role in its successful implementation (Tandon, 2020), it is necessary to investigate the factors that contribute to acceptance and usage (Venkatesh et al., 2012).

Furthermore, the effectiveness of WhatsApp as a teaching tool ultimately relies on teacher use (Gon & Rawekar, 2017), and its benefits are minimised if teachers do not use it in their teaching (Yanti & Setiawan, 2018). Aguilera-Hermida (2020) asserts that a digital teaching platform is not beneficial unless used to its full capability. Cabero-Almenara et al. (2019) are also of the view that the success of any digital teaching platform in any institution of learning starts with teachers' acceptance, which in turn promotes learners' use of such platform. ERT is a novel approach in public secondary schools in South Africa, and with the widespread use of WhatsApp for delivering it, various factors have an impact on teachers' decisions to accept and use WhatsApp for ERT, which was the focus of the present study.

Factors that influence teachers' behavioural intentions to accept and use WhatsApp for ERT, particularly during the Covid-19 pandemic, are still unknown and need to be explored. When the Covid-19 pandemic is over, schools should not forget about the factors influencing teachers' behavioural intention to accept and use WhatsApp for ERT. Similar emergencies are likely to arise in the future, forcing schools to close, and consequently, teachers would be expected to implement ERT. Therefore, it is essential to probe the factors influencing teachers' behavioural intention to accept and use WhatsApp for ERT in order for schools to be better prepared for future ERT implementation demands (Hodges, Moore, Lockee, Trust & Bond, 2020).

Knowing and understanding the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT may help schools to improve teachers' acceptance and make necessary decisions. In addition, understanding the factors influencing teachers' intentions to accept and use WhatsApp for ERT would help schools to integrate the factors into future remote teaching solutions. Furthermore, in order to increase the acceptance of WhatsApp for ERT, the factors influencing teachers' intention to accept and use WhatsApp for ERT must be considered. In this study, the UTAUT2 was extended to investigate the factors influencing secondary school teachers' behavioural intention to accept and use

WhatsApp for ERT. Although many studies have used the UTAUT2 to investigate the factors influencing teachers' behavioural intention to accept and use social media applications for teaching, most of those studies were conducted in developed countries (Alghizzawi et al., 2019; Al-Qaysi et al., 2021; Khlaif, 2018; Salloum et al., 2018).

In developing countries, more specifically South Africa, a shortage of research exists regarding factors influencing teachers' behavioural intention to accept and use social media platforms for teaching (Cilliers et al., 2017). Therefore, extrapolating research results from developed countries to developing countries would be questionable, because the countries have different cultures, which affect the research findings (El-Masri & Tarhini, 2017; Gupta & Dogra, 2017). Therefore, the results of the studies that investigated the factors influencing teachers' acceptance of social media applications for teaching in developed countries cannot be relevant to South Africa. This suggests a need for further research on the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in South Africa. Filling this literature gap is essential, because many secondary schools are progressing towards implementing ERT using WhatsApp (Czerniewicz et al., 2020). Therefore, it becomes vital to have an in-depth awareness of the factors influencing secondary school teachers' behavioural intention to accept or reject WhatsApp for ERT, as this information is helpful to secondary schools that are currently implementing ERT using WhatsApp or planning to do so.

## **1.5 PROBLEM STATEMENT**

The DBE encouraged all secondary schools in quintiles 1 to 3 to use WhatsApp for ERT due to its availability and accessibility among teachers and learners to ensure the continuity of education during the Covid-19 pandemic (Nkambule, 2023). The DBE also launched the WhatsApp Teacher Connect Platform to empower and support teachers with the transition to ERT and provide them with teaching content. In addition, the Limpopo Department of Basic Education partnered with Statistics South Africa and Telkom to provide all quintile 1 to 3 teachers and grade 12 learners with tablets and monthly data bundles (Independent Online, 2022). However, despite the support and encouragement provided by the DBE, the adoption of WhatsApp as a platform for ERT was slow and very low in the secondary schools in the Namakgale Circuit (Namakgale



Circuit, 2020). For ERT to be successfully implemented using WhatsApp in the secondary schools in the Namakgale Circuit, it is important to understand the factors that influence teachers to accept and use WhatsApp for ERT. ERT and teaching using WhatsApp are new experiences to most secondary school teachers, and unfortunately, none of them were fully prepared and professionally trained to use WhatsApp for ERT (Toquero & Talidong, 2020). Consequently, some teachers tend to have adverse reactions and a low acceptance rate of WhatsApp for ERT, which impedes the successful implementation of ERT in secondary schools. Additionally, some teachers did not want to make use of it due to their negative attitude towards it as a platform for teaching (Suryana et al., 2021).

Yanti and Setiawan (2018) point out that when teachers have negative attitudes towards online teaching and learning platforms and have no intention of using them in the future, it becomes a problem that impedes the growth of remote teaching. In addition, when teachers remain non-accepting of online learning platforms, it becomes disadvantageous for learners, because the platforms would not be used to their full extent for maximum benefit (Yanti & Setiawan, 2018). According to Maramba and Mazongonda (2020), for a learning platform to be adopted and implemented effectively, a solid understanding of the factors contributing to users' acceptance is necessary, because teachers' intentions and attitude towards it play an essential role in its adoption. Therefore, teachers' acceptance of WhatsApp for ERT is central to the successful implementation of ERT in secondary schools. This study investigated the factors influencing secondary school teachers' acceptance and use of WhatsApp for ERT.

Several studies investigated the factors affecting teachers' intentions to accept and use social media platforms for teaching and learning (Alghizzawi et al., 2019; Alshurideh et al., 2019; Eraslan Yalcin & Kutlu, 2019; Luk et al., 2018; Pal & Vanijja, 2020; Song & Kong, 2017) and teachers' intentions to accept and use WhatsApp for teaching and learning in post-secondary schools (Gon & Rawekar, 2017; Maphosa et al., 2020; Mbukusa, 2018). However, these studies focused mainly on higher education institutions, and, as a consequence, a shortage of research exists that targets secondary schools (Alghizzawi et al., 2019). The available literature pertaining to higher education lecturers' acceptance of social media platforms for teaching and learning cannot be replicable or generalised to secondary school teachers, as the two

populations are distinct (Lo et al., 2018). This creates a need for further research on teachers' acceptance and use of WhatsApp as teaching and learning tool at school level (Alghizzawi et al., 2019).

Furthermore, the use of WhatsApp for teaching and learning is a relatively new phenomenon in schools and still at the primary development stage, which is why more research is needed (Owusu-Boakye et al., 2022). Moreover, the investigation into the factors influencing secondary teachers' behavioural intention to accept and use social media platforms for teaching, notably during ERT, is still lacking, and therefore further research is needed in this area (Amin & Sundari, 2020). Little is still known about the factors influencing secondary school teachers' intentions to accept and use social media platforms for teaching, particularly WhatsApp. Therefore, the current study sought to bridge this gap by investigating the factors that influence secondary school teachers' intentions to accept and use WhatsApp for ERT.

#### 1.5.1 Research question

The following research question guided this study: What factors influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The following research sub-questions guided this study, emanating from the main research question:

1. What is the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit?
2. What is the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?
3. What is the influence of teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?
4. Which factor can best predict secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

#### 1.5.2 Aim and objectives

This research aimed to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

In order to achieve the aim of the study, the following objectives were set:

1. To assess the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit
2. To explore the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit
3. To explore the influence of teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit
4. To determine the factor that best predicts secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

### 1.5.3 Hypotheses

The following hypotheses were formulated:

**H1:** Performance expectancy influences behavioural intention to accept and use WhatsApp for ERT.

**H2:** Effort expectancy influences behavioural intention to accept and use WhatsApp for ERT.

**H3:** Social influence influences behavioural intention to accept and use WhatsApp for ERT.

**H4:** Facilitating conditions influence behavioural intention to accept and use WhatsApp for ERT.

**H5:** Hedonic motivation influences behavioural intention to accept and use WhatsApp for ERT.

**H6:** Teaching value influences behavioural intention to accept and use WhatsApp for ERT.

**H7:** Habit influences behavioural intention to accept and use WhatsApp for ERT.

**H8:** Attitude towards use influences behavioural intention to accept and use WhatsApp for ERT.

**H9:** Personal innovativeness influences behavioural intention to accept and use WhatsApp for ERT.

**H10:** Self-efficacy influences behavioural intention to accept and use WhatsApp for ERT.

## **1.6 ASSUMPTIONS OF THE STUDY**

The following were key assumptions of this study:

- The respondents will answer the questions to be asked on the questionnaire honestly.
- The questions that will be asked on the questionnaire will be clear to the respondents.

## **1.7 PRELIMINARY LITERATURE REVIEW**

This section presents a preliminary review of the literature related to the phenomenon under study. The section starts by providing an overview of ERT and thereafter provides a discussion of the use of WhatsApp for ERT.

### **1.7.1 Overview of emergency remote teaching**

Oumar et al. (2021) describes ERT as a temporary transition from traditional classroom instruction to remote teaching due to a pandemic crisis. Hodges, Moore, Lockee, Trust and Bond (2020) contend that ERT entails the use of fully remote teaching solutions for education that would usually be provided face to face with the aim of returning to that format after the crisis has passed. Aguliera and Nightengale-Lee (2020) assert that ERT can be implemented in two ways: using digital platforms or in the form of paper-based distance education, where teachers send learning materials and assignments to learners' homes. However, Sleeman et al. (2020) observed that due to lockdown regulations and Covid-19 protocols, digital platforms were the only viable option to implement ERT.

According to Bawa (2020), it is crucial to differentiate between ERT and online teaching, as they are often mistaken to be synonymous. Chirinda et al. (2021) argue

that the difference between ERT and online teaching is critical, as the development of learning approaches based on incorrect assumptions and conjectures often results in misunderstandings and errors in an education system. In contrast to online learning, which is well planned and designed to be online, ERT represents an abrupt and unplanned transition from traditional classroom-based instruction to a distance learning model (Hodges, Moore, Lockee, Trust & Bond, 2020). Moreover, it is worth noting that the main objective of ERT is not to recreate a comprehensive educational environment, but to provide temporary access to teaching and learning in a way that is easy to set up and reliable during a crisis (Hodges, Moore, Lockee, Trust & Bond, 2020)

#### 1.7.2 The use of WhatsApp for emergency remote teaching

WhatsApp is an instant messaging application for smartphones (Ujakpa et al., 2018). It is the most popular instant messaging application for implementing ERT at public secondary schools (Chirinda et al., 2021). It offers many features that make it a popular and excellent low data-consuming platform for delivering ERT to learners from public schools. One feature that made it a popular platform for delivering ERT is its ability to easily create classroom WhatsApp groups (Maphosa et al., 2020). Classroom WhatsApp groups have become platforms for delivering ERT to learners from the same class. These groups allow teachers to deliver their lessons in text or multimedia messages to many learners within a short period, and learners can access such messages from anywhere and at any time (Mbukusa, 2018; Sari & Putri, 2019). Classroom WhatsApp groups also allow members to communicate and collaboratively participate in discussions on selected topics (Amin & Sundari, 2020; Maphosa et al., 2020; Muthmainnah, 2020). In addition, both teachers and learners can post instant voice notes within the class WhatsApp groups to ask or answer questions.

Furthermore, teachers can directly offer one-on-one sessions to learners who need differentiated instructions (Maphosa et al., 2020). Moreover, the most crucial benefit of using WhatsApp for delivering ERT is that it promotes fun-based learning and allows learners to express their ideas and thoughts through its several features, such as sharing videos, pictures and web links (Muthmainnah, 2020). This shows that WhatsApp has been expanded from its primary role as a communication tool to a teaching tool, and evidence shows its effectiveness (Amin & Sundari, 2020). Most

recently, the use of WhatsApp in education has emerged from a basic communication tool between teachers and learners to a platform for delivering ERT. Several studies have been conducted to probe the effectiveness of WhatsApp for teaching (Ahmed, 2019; Alubthane & ALYoussef, 2021; Hussain et al., 2020; Oyewole et al., 2020; Saleh, 2019). The general findings of these studies indicated that WhatsApp is an effective teaching tool and that it should not be restricted to its conventional role as a communication tool.

Khubyari (2016) contends that effective online teaching is achieved when teachers and learners effectively interact, and WhatsApp allows such interactions to occur regularly. Similarly, Diaz et al. (2015) found that these interactions promote formal learning, and that WhatsApp allows teachers and learners to access information from anywhere and at any time. Furthermore, the use of WhatsApp for teaching increases learners' motivation towards learning (Ahmed, 2019) and supports learning outside the classroom (Rahman et al., 2018). In addition, teaching using WhatsApp has a positive impact on learners' learning performance (Maphosa et al., 2020). A study by Gon and Rawekar (2017) found that an experimental group taught using WhatsApp outperformed a control group taught using the traditional face-to-face method with a t-value of 0.635 between the two groups.

## **1.8 BRIEF INTRODUCTION TO THEORETICAL FRAMEWORK**

Several technology acceptance models and theories have been employed as a theoretical basis to investigate the factors influencing users' acceptance and use of technology in different contexts (Açıkgül & Şad, 2021; Maphosa et al., 2020; Oumar et al., 2021). This study employed the UTAUT2 as a guiding theoretical framework. Venkatesh et al. (2012) developed the UTAUT2 based on the original version of the Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT2 was developed to overcome the limitations of the UTAUT and includes the constructs of performance expectancy, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation and habit as antecedents of behavioural intention and use behaviour. In addition, UTAUT2 posits that the relationships among the variables are moderated by experience, gender and age.

For this study, the UTAUT2 was extended to investigate the factors that influence secondary school teachers' behavioural intention to accept and use WhatsApp for

ERT in the Namakgale Circuit. The UTAUT2 was extended by substituting the price value construct with the teaching value construct and adding three more constructs, namely attitude towards use, personal innovativeness and self-efficacy as determinants of behavioural intention to accept and use WhatsApp for ERT. These constructs are considered important when investigating the factors that influence teachers' behavioural intentions to accept and use digital platforms for teaching (Khan, 2018; Khechine & Augier, 2019). The use behaviour construct and moderator variables of experience, gender and age were excluded in the extended UTAUT2. The use behaviour construct was excluded because the study aimed at investigating the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. The moderator variables were excluded for their insubstantial moderating influence in digital learning platforms acceptance studies (Cavus, Mohammed & Yakubu, 2021).

This study used the UTAUT2 as a theoretical basis, because the UTAUT2 is more comprehensive and robust in explaining users' behavioural intention to use technology compared to other technology acceptance frameworks. Venkatesh et al. (2012) posit that the UTAUT2 can explain up to 74% of the variance in users' behavioural intention to use technology. In addition, the UTAUT2 was chosen because it has high validity and reliability. Many studies investigating technology acceptance have confirmed the reliability and validity of the theory (Araújo et al., 2021; Azizi et al., 2020; El-Masri & Tarhini, 2017; Skoumpopoulou et al., 2018). The UTAUT2 has been widely employed by several researchers investigating factors influencing teachers' acceptance of various technologies for teaching. For example, Ismail et al. (2022) employed the UTAUT2 to study the determinants of secondary school teachers' behavioural intention to accept mobile technology for teaching in Malaysia. Their results revealed that effort expectancy, hedonic motivation and habit had a significant influence on behavioural intention to accept mobile technology for teaching. Contrary to their expectation, the results revealed that performance expectancy, social influence, facilitating conditions and price value had a non-significant influence on behavioural intention to accept mobile technology for teaching. Furthermore, the researchers concluded that the UTAUT2 is an excellent theoretical basis for examining the factors influencing secondary school teachers' behavioural intention to accept mobile technology for teaching.

Another study by Omar et al. (2019) also used the UTAUT2 as a theoretical framework to determine the factors affecting secondary school teachers' behavioural intention to accept and use mobile technology for teaching in Malaysia. Their findings showed that effort expectancy, hedonic motivation and habit affect secondary school teachers' behavioural intention to accept and use mobile technology for teaching. Contrary to their expectations, the findings demonstrated that performance expectancy, social influence and price value did not affect secondary school teachers' behavioural intention to accept and use mobile technology for teaching.

## **1.9 RESEARCH METHODOLOGY AND DESIGN**

This section provides a brief discussion of the research methodology and design employed in this study, including the research paradigm, research approach, research design, sampling procedure, data collection instrument and data analysis procedures.

### **1.9.1 Research paradigm**

In educational research, research paradigm describes a researcher's worldview (Mackenzie & Knipe, 2006). The worldviews can be grouped into three main paradigms, namely interpretivism, positivism and critical theory (Kivunja & Kuyini, 2017; Rehman & Alharthi, 2016). For this study, the positivism research paradigm was used as a philosophical underpinning. A positivism research paradigm refers to a worldview to research that is based on "what is known in research methods as the scientific method of investigation" (Kivunja & Kuyini, 2017, p. 30). For this study, the positivism research paradigm was chosen for the following four reasons. Firstly, positivist studies employ quantitative measures to gather empirical data and explain human behaviour (Habib, 2020). Maree (2007) asserts that research located in positivism philosophy relies on collecting quantitative data and involves hypothesis testing. In this study, quantitative data were collected from secondary school teachers to validate the proposed extension of the UTAUT2 and test the formulated hypotheses. Secondly, positivist studies typically employ the deductive approach to research (Alakwe, 2017; Saxena, 2019). In deductive studies, researchers study a specific theory and then formulate hypotheses (Bryman, 2016; Malhotra, 2017). Therefore, in this study, the UTAUT2 was employed as a theoretical basis to produce the proposed extension of the UTAUT2 and test the formulated research hypotheses.



Thirdly, positivism is usually used to examine cause-and-effect relationships (Kivunja & Kuyini, 2017; Rehman & Alharthi, 2016). In the positivist view, the research problem is caused by several factors, and therefore the researcher should investigate the causes of the dependent variable. In this study, secondary school teachers' behavioural intention to accept and use WhatsApp for ERT was caused by other independent variables. These independent variables were performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness and self-efficacy. Finally, positivist studies usually employ sophisticated statistical techniques to analyse data (Ryan, 2018). Therefore, in this study, statistical techniques were used to empirically test the proposed extension of the UTAUT2 and test the research hypotheses.

### 1.9.2 Research approach

The research approach is a plan and procedure for conducting research consisting of the steps from broad assumptions to detailed data collection methods, analysis and interpretation (Creswell, 2014). Grønmo (2019) names three common approaches to conducting research, namely quantitative, qualitative and mixed methods. Given the positivism research paradigm within which this study was located, the quantitative research approach was adopted as an approach for “testing objective theories by examining the relationship among variables which in turn can be measured so that numbered data can be analysed using statistical procedures” (Creswell, 2014, p. 4). This approach is typically used to describe variables, measure their relationships and examine the cause-and-effect relationships (Burns et al., 2015). In addition, a quantitative approach is used to investigate a particular problem “through the measurement of carefully selected variables in quantifiable terms” (Mertler, 2019, p. 1).

The quantitative approach was deemed appropriate for this study, because other researchers (Creswell, 2014; Kivunja & Kuyini, 2017) indicated that it is appropriate when the aim of the study is to investigate the elements that have an impact on an outcome. The choice of this design is also justifiable because the UTAUT2 is quantitative and most studies on technology acceptance have used the quantitative research approach to investigate the factors influencing technology acceptance (Gunasinghe et al., 2019; Hammouri & Abu-Shanab, 2018; Saputra et al., 2020; Siron

et al., 2020; Yakubu & Dasuki, 2019). Furthermore, a quantitative approach was suitable for this study, as it provided information on the relationship between variables forming the factors influencing secondary school teachers' acceptance and use of WhatsApp for ERT.

### 1.9.3 Research design

Gray (2019) describes the research design as an overarching plan used to gather, measure and analyse data in a research study. Its purpose is to specify a strategy for generating empirical evidence to address the research questions (McMillan & Schumacher, 2014). Therefore, in this study, a survey research design was employed to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. Survey research design is a procedure in quantitative research in which the researcher administers a questionnaire to a sample of the population in order to collect data (Creswell & Hirose, 2019). Survey research design is frequently used in educational research to describe the behaviours, perceptions, beliefs, opinions, attitudes or characteristics of the population (Creswell & Hirose, 2019; McMillan & Schumacher, 2014).

### 1.9.4 Population and sampling

A research population refers to the entire group of people or objects that researchers consider to be the study subjects (Hair et al., 2016), while the target population is the entire set of individuals to which the researcher desires to make generalisations (Etikan & Bala, 2017). The target population for this study included 248 teachers from all seven public secondary schools in the Namakgale Circuit in the Limpopo province. All the seven secondary schools are in Quintile 3. The population was targeted on the basis that it implemented ERT using WhatsApp as recommended by the DBE. In addition, the population was easily accessible to the researcher. Studying the whole population is sometimes challenging, and even impossible for some studies, due to budget and time constraints (Joubert, 2018; Thikhathali, 2018). Because of these constraints, it becomes essential for researchers to select a population sample from which to conduct their studies (Hair et al., 2016).

Sampling involves selecting participants or subjects from the population of interest in a research study (Turner, 2020). Researchers can use various sampling procedures to choose a sample from the population. However, the selection of a sampling

procedure to be used in research rests on the nature of the research design, the availability of participants, the amount of rigour sought from the study, the characteristics of the population, and time and cost limitations (Creswell, 2015; Hair et al., 2016). Given the aforementioned, this study employed a convenience sampling method to select a sample of 215 secondary school teachers from all seven public schools in the Namakgale Circuit.

The convenience sampling procedure is a type of non-probability sampling where data are gathered from individuals of the target population who are accessible and conveniently available to participate in a research study (Etikan & Bala, 2017; Etikan et al., 2016). For this study, the respondents were selected based on their accessibility, availability at a given time and desire to participate in the research. The convenience sampling method was employed in this study to allow the researcher to conveniently gather larger data within a short period, as recommended by Etikan et al. (2016). The sample size for this study was considered representative of the target population based on the variables calculated based on the recommendations of Schikorski and Stevens (1997) of 15 observations per variable. This study had 11 variables; therefore, the sample size was calculated by multiplying 11 variables by 15, which equals a sample size of 165 secondary school teachers. Therefore, a sample size of 215 secondary school teachers was considered sufficient for this study.

#### 1.9.5 Data collection instrument

Data collection is the process whereby researchers collect and evaluate information on variables of interest in a structured manner that allows them to address research questions, test hypotheses and assess outcomes (Kabir, 2016). It is the most crucial stage of any research project (Kabir, 2016). Bowling (2014) names four main techniques that researchers may use when collecting data, namely interviews, observations, analysis of documented records and questionnaires. Nardi (2018) posits that the choice of the appropriate technique depends on several factors, including the research question or hypotheses, the literacy level of respondents, the available resources, access to potential respondents, and the costs and timeframe. Data for this study were gathered using a questionnaire. Kabir (2016) defines a questionnaire as a research instrument consisting of a collection of questions and other prompts designed to gather data from respondents. It is the most widely used instrument for gathering

data in survey research (Yusoff et al., 2021). Although questionnaires can be administered face to face, paper-based or online (Nardi, 2018), for this study, a self-administered online questionnaire was designed and administered using Google Forms to collect data from the respondents. Google Forms was chosen for the following reasons: It is easy to access, it is entirely free to use and it automatically collects answers in a Google spreadsheet, making data analysis simple (Vasanth & Harinarayana, 2016).

Furthermore, an online questionnaire allows the researcher to conveniently and cost-effectively gather data from many respondents in a limited period (Kabir, 2016). Creswell (2014) states that researchers can develop their own questionnaire, use a pre-existing questionnaire or modify existing questionnaires when gathering data using a questionnaire. Therefore, the questionnaire for this study was adapted from pre-existing UTAUT2 questionnaires (Azizi et al., 2020; Bendary & Al-Sahouly, 2018; Sharif et al., 2019; Venkatesh et al., 2012) and other questionnaires measuring the construct of learning value (Ain et al., 2015), attitude towards use (Davis et al., 1989), personal innovativeness (Agarwal & Prasad, 1998) and self-efficacy (Compeau & Higgins, 1995). The questionnaire was then modified to fit the context of the study. Pre-existing questionnaires are preferred for use because they have high reliability and validity in measuring the targeted variables (Tsang et al., 2017).

The online questionnaire was designed to be completed anonymously. It began with an introductory paragraph indicating the study description, aim and objectives and ethical assurances. The paragraph ended with a 'consent item' for respondents to give consent by selecting either "I agree to participate" or "I do not want to participate". If the respondents selected "I agree to participate", they were given access to the questionnaire, but if they selected "I do not want to participate", access to the questionnaire was denied and they were logged out. The main part of the questionnaire was divided into two major sections, both of which collected data that were useful to this study. The first section collected the respondents' demographic information such as gender, age and experience with using WhatsApp for ERT. The inclusion of demographic information helped the researcher to determine whether he was reaching the appropriate respondents.

The second section consisted of 11 constructs of the extended UTAUT2, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention. These constructs were measured using a five-point Likert scale, as recommended by Chong et al. (2017), to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. The respondents were asked to score the extent to which they agreed or disagreed with each statement using the five-point Likert scale, ranging from 1 = Strongly disagree to 5 = Strongly agree. The link to the online questionnaire was disseminated to a convenient sample of secondary school teachers in the Namakgale Circuit by mail, SMS and WhatsApp during the first week of August in 2022.

#### 1.9.6 Data analysis

In quantitative research, data analysis entails explaining and interpreting the numerical data obtained from a measuring instrument (Creswell, 2015). For this study, once the respondents had completed the online questionnaire, the responses captured in Google Forms were downloaded into a Microsoft Excel spreadsheet. Thereafter, the responses were coded numerically and imported into the Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS) version 28 to perform descriptive statistical analysis and covariance-based structural equation modelling (CB-SEM) analysis, respectively. The descriptive statistics were used to describe and summarise the data obtained through the questionnaire using mathematical procedures such as measures of central tendency, frequencies and percentages. Conversely, the CB-SEM analysis was used to test the stated hypotheses.

### **1.10 RELIABILITY AND VALIDITY**

Mohajan (2017) asserts that validity and reliability are the two most critical and fundamental criteria for assessing any measuring instrument or tool for good research. Sürücü and Maslakçi (2020) contend that validity and reliability are critical elements enabling research studies to produce beneficial results. Validity is concerned with whether an instrument measures what it is intended to measure (Sürücü & Maslakçi, 2020). Conversely, reliability describes the degree to which a measuring instrument

consistently yields similar results on repeated occasions in the same situation (Heale & Twycross, 2015). In this study, the first step in dealing with the issues of reliability and validity was to use a pre-existing UTAUT2 questionnaire as developed by Venkatesh et al. (2012), but to amend it to suit the context of this study because of its high validity and reliability (Azizi et al., 2020; Bendary & Al-Sahouly, 2018; Sharif et al., 2019). In addition, the study also adapted pre-existing questionnaires measuring the construct of learning value (Ain et al., 2015), attitude towards use (Davis et al., 1989), personal innovativeness (Agarwal & Prasad, 1998) and self-efficacy (Compeau & Higgins, 1995). Furthermore, the reliability of the questionnaire was ensured by measuring its internal consistency. This was done by computing Cronbach's alpha using SPSS. Cronbach's alpha is the most widely employed method to ascertain the internal consistency of a measuring instrument (Hayes & Coutts, 2020). The Cronbach's alpha coefficient values range from 0 to 1, with a value of 0.70 or higher indicating acceptable internal consistency (Hayes & Coutts, 2020). In this study, an overall Cronbach's value of 0.882 was obtained for the questionnaire, suggesting good internal consistency reliability (Hair et al., 2021).

The questionnaire was also subjected to three validity tests, namely face, content and construct validity, to correct any construct or grammatical errors and ensure that it measured what it ought to measure. Therefore, for this study, the questionnaire's face validity was assessed by the researcher and the research supervisor. The content validity on the other hand was only judged by the research supervisor because of time constraints and her familiarity and expertise with the constructs being measured. The comments and suggestions by the research supervisor were used to revise the questionnaire before constructing a final questionnaire. Furthermore, the questionnaire was pilot-tested on 15 secondary school teachers who were non-participants in the main study. Pilot testing helps researchers to identify problems that may occur in wording and measurement (Sekaran & Bougie, 2016).

In this study, construct validity was assessed by measuring convergent and discriminant validity. Convergent validity was assessed by computing the factor loadings of the items, composite reliability and average variance extracted (AVE) of the constructs, as recommended by Fornell and Larcker (1981). Discriminant validity was achieved when the square root of the AVE for each construct of the extended UTAUT2 was higher than the construct's correlation with other constructs.

### **1.11 RESEARCH ETHICS**

Kaewkungwal and Adams (2019) explain that ethical values and principles should be observed when conducting research involving human subjects. Therefore, this study was strictly conducted following the ethical guidelines outlined by the University of South Africa's College of Education Ethics Review Committee. Before conducting the study, an ethical clearance certificate was sought from the College of Education Ethics Review Committee. Thereafter, permission to conduct the research was sought from the Limpopo Department of Education, Mopani District, the Namakgale and Lulekani circuits and the participating schools. Before administering the online questionnaire, the researcher informed the respondents personally and in writing about the purpose of the study and the benefits of their participation. The respondents were assured that their participation in this study was entirely voluntary and that they may withdraw from participating at any moment prior to clicking the submit button on the online questionnaire due to the anonymous nature of the online questionnaire. Furthermore, the researcher also made every effort to protect the respondents' identity and maintain confidentiality. The questionnaire did not collect personal identifiable information that could link the respondents personally, and their names and the names of the participating schools would not be identified in the research report.

### **1.12 DELIMITATIONS OF THE STUDY**

Delimitations are the boundaries of a research study set by the researcher (Theofanidis & Fountouki, 2018). Ross and Bibler Zaidi (2019) assert that there is no research study without delimitations. The present study had certain delimitations that restricted its scope. The delimitations were threefold. Firstly, the study was delimited to the Namakgale Circuit in the Limpopo province, South Africa. This is because the DBE encouraged all secondary school teachers in quintile 1 to 3 to use WhatsApp for ERT, teachers from Namakgale Circuit included. Secondly, the study was delimited to a target population of 248 secondary school teachers in the Namakgale Circuit. Finally, owing to time restrictions, the current study was restricted to employing a convenience sample of secondary school teachers in the Namakgale Circuit. Therefore, the research results of this study should be generalised with caution.

### **1.13 DEFINITION OF KEY CONCEPTS**

This section presents the definitions of key concepts that will help the reader understand the meaning of the concepts in the context of this study.

- 'Attitude towards use' refers to the positive or negative feelings of secondary school teachers in using WhatsApp for ERT.
- 'Behavioural intention' refers to a teacher's likelihood to use WhatsApp for ERT in the future or not.
- 'Effort expectancy' refers to an individual teacher's belief about how easy it is to use WhatsApp for ERT.
- 'Facilitating conditions' refer to a secondary school teacher's perception that there are organisational and technical resources to support the use of WhatsApp for ERT.
- 'Factors' refers to the determinants of secondary school teachers' behavioural intention to use WhatsApp for ERT, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness and self-efficacy.
- 'Habit' describes the extent to which secondary school teachers tend to perform habitual behaviours in using WhatsApp for ERT.
- 'Hedonic motivation' denotes the enjoyment or pleasure experienced by secondary school teachers when using WhatsApp for ERT.
- 'Performance expectancy' describes the extent to which using WhatsApp provides benefits to teachers when implementing ERT.
- 'Personal innovativeness' describes a teacher's willingness to find innovation by using WhatsApp for ERT.
- 'Self-efficacy' refers to teachers' assessment of their ability to use WhatsApp for ERT.
- 'Social influence' describes the extent to which secondary school teachers believe that important others think that they should use WhatsApp for ERT.



- 'Teaching value' refers to secondary school teachers' cognitive trade-off between the perceived value of WhatsApp and the time and effort invested in using it for ERT.
- 'WhatsApp acceptance' refers to teachers' willingness toward using WhatsApp for ERT voluntarily and continuously.
- 'WhatsApp use' refers to teachers' actual use of WhatsApp for ERT.
- 'WhatsApp' refers to a social media platform for instant messaging installed on smartphones that enables teachers to deliver ERT.

## **1.14 CHAPTER OUTLINE**

### Chapter 1: Introduction and background

Chapter 1 is the introduction and background of the study. The chapter presents the background to the research problem, the problem statement, the main research question and sub-questions and the aim and objectives of the study. It also outlines the rationale for the study, the preliminary literature review, offers a brief introduction to the theoretical framework, and describes the research methodology and design used in this study, including the reliability and validity issues. In addition, the chapter provides the definitions of key concepts, followed by the layout of the chapters.

### Chapter 2: Theoretical framework

Chapter 2 discusses the theoretical underpinnings of the study. It starts with a discussion of some theories and models of technology acceptance that are commonly used, followed by a discussion on the UTAUT2 as a theoretical framework for this study. An extensive review of the literature relating to the application of the UTAUT2 in the study is also provided. Finally, the proposed extension of the UTAUT2 is presented.

### Chapter 3: Literature review

Chapter 3 presents an extensive review of the existing literature and studies related to the research problem. The literature review is based on what other scholars have already found about the phenomenon under study, taking into consideration the gap that exists in the literature.

#### Chapter 4: Research design and methodology

Chapter 4 describes the research design and methodology employed in this study and the justification of the chosen research methods in detail. It begins with a discussion of the philosophical underpinning of the study. Then, the chapter discusses the research approach and research design employed in this study. Thereafter, the study population and sampling procedure, data collection method, data analysis procedures and issues of validity and reliability are explained and discussed. Lastly, the ethical considerations that were considered when conducting this study are explicated.

#### Chapter 5: Research results and discussion

Chapter 5 presents the research results and the discussion of the results concurrently. The research results are presented systematically with the goal of answering the research questions and confirming the stated hypotheses. The descriptive statistics of the data derived from the online questionnaire completed by secondary school teachers in the Namakgale Circuit are presented. In addition, the chapter presents the results of the CB-SEM analysis to confirm the stated hypotheses.

#### Chapter 6: Conclusion and recommendations

Chapter 6 begins by providing a brief overview of the study. Then, a summary of the key findings of this study is provided. Thereafter, the contributions and practical implications of this study are discussed, followed by the limitations of this study. Finally, the recommendations for further research and concluding remarks are presented.

### **1.15 SUMMARY**

The current chapter presented an introduction and background to the study. It outlined the rationale for the study, the problem statement, the main research question and sub-questions, the aim and objectives of the study, and the hypotheses. It also provided a brief introduction to literature and theoretical frameworks. A brief description of the research methodology and design for this study was also provided, including the study population and sampling strategy, method of data collection, data analysis procedures, reliability and validity, and ethical considerations. The assumptions and delimitations of the study were outlined, followed by the definitions

of key concepts. Finally, an outline of the chapters was provided. The next chapter provides a discussion of the theoretical framework used in the present study.

## CHAPTER 2

### THEORETICAL FRAMEWORK

#### 2.1 INTRODUCTION

The previous chapter presented the introduction and background of the study. This chapter focuses on the theoretical framework of the study. A theoretical framework is “the structure that can hold or support a theory of a research study” (Swanson, 2013, p. 122). It consists of the theories articulated by specialists in the field of a research study, including how to analyse data and interpret the research results (Kivunja, 2018). In other words, a theoretical framework serves as a foundation within which a study is conducted (Adom et al., 2018). In quantitative studies, researchers use theories deductively right from the start when planning a research study (Saxena, 2019). Therefore, because this study was quantitative, it is essential to indicate the theory that underpinned this study. This study was theoretically underpinned by the UTAUT2 developed by Venkatesh et al. (2012).

This chapter is divided into two major sections. The first section serves to examine the theoretical framework that guided this research and to evaluate the literature related to it. It starts by providing a critical review of other dominant theories and models of technology acceptance and their related limitations. The section ends with a discussion of the UTAUT2 as a theoretical framework for this study and its applicability to the present study. It also provides an extensive review of studies employing the UTAUT2 in different contexts. Finally, the second section presents the proposed extension of the UTAUT2 and the hypotheses.

#### 2.2 OVERVIEW OF MODELS AND THEORIES OF TECHNOLOGY ACCEPTANCE

Technology acceptance is regarded as the most active study area that has garnered significance in the fields of information technology (IT) and information systems (ISs) (Arpaci, 2021; Rad et al., 2018). Technology acceptance is viewed by Arning and Ziefle (2007) as an individual’s willingness, agreement and continuous use of technology. Technology acceptance has been studied through various theories and models, which introduced factors that may influence people’s acceptance and use of technology (Malatji et al., 2020; Taherdoost, 2018). Several theories and models have

been proposed to understand and explain the elements influencing an individual's acceptance and use of technology (Chao, 2019; Lai, 2017; Momani & Jamous, 2017).

Models such as the Technology Acceptance Model (TAM) (Davis, 1989), the Combined Technology Acceptance Model and Theory of Planned Behaviour (C-TAM-TPB) (Taylor & Todd, 1995), the Model of Personal Computer Utilisation (MPCU) (Thompson et al., 1991), the Motivational Model (MM) (Davis et al., 1992) and theories such as innovation diffusion theory (IDT) (Rogers, 1995), social cognitive theory (SCT) (Bandura, 1986), the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), the theory of planned behavior (TPB) (Ajzen, 1991), the UTAUT (Venkatesh et al., 2003) and the UTAUT2 (Venkatesh et al., 2012) have been widely used to account for an individual's acceptance and use of IT or ISs. However, among these models and theories, the UTAUT2 is the most widely applied theory to investigate the factors influencing technology acceptance and use (Aburumman, 2021; Andrew et al., 2021).

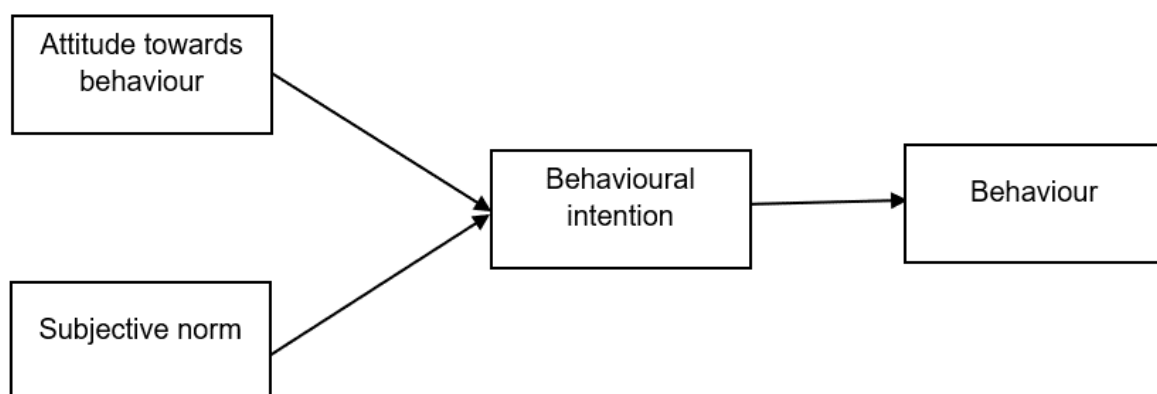
This study applied the UTAUT2 as a theoretical framework to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for ERT. UTAUT2 is an extension of Venkatesh et al.'s (2003) UTAUT, which was developed based on integrating the elements of eight dominant models and theories of technology acceptance, namely the TAM, C-TAM-TPB, MM, MPCU, TRA, TPB, SCT and IDT. Therefore, this section starts with a systematic overview of the models and theories considered for the development of the UTAUT2, namely the TRA, TPB, TAM, C-TAM-TPB, MM, MPCU, SCT, IDT and UTAUT. It is essential to critically review the theories and models used to develop the UTAUT2 to enrich the reader's understanding of the UTAUT2.

Although these theories and models are dominant theoretical frameworks for studying the determinants of behavioural intentions to accept and use various technologies, they were considered weak in addressing the research questions of this study. As a result, the TRA, TPB, TAM, C-TAM-TPB, MM, MPCU, SCT, IDT and UTAUT were considered unsuitable for this study, and they were not investigated. Furthermore, despite the fact that some of the constructs germane to this study, such as facilitating conditions, social influence, effort expectancy, performance expectancy, hedonic motivation, habit and behavioural intention, are present in the TRA, TPB, TAM, C-TAM-TPB, MM, MPCU, SCT, IDT and UTAUT, all these constructs are found in the

UTAUT2, justifying the selection of the UTAUT2 as the guiding theoretical framework for this study.

### 2.2.1 The theory of reasoned action

The TRA was developed by Fishbein and Ajzen (1975) in social psychology to explain a wide range of human behaviour. Although the TRA was initially developed to study consumer behaviour, it became a foundation for investigating technology acceptance (Taherdoost, 2018). The TRA is the most influential and oldest theory used for studying technology acceptance (Imtiaz & Maarop, 2014; Momani & Jamous, 2017). The majority of theories and models of technology acceptance have been developed based on the TRA (Imtiaz & Maarop, 2014). For example, the TPB, TAM, C-TAM-TPB and UTAUT have used the construct of behavioural intention of the TRA as an immediate antecedent of actual behaviour. Vatanparast (2012) contends that most technology acceptance theories and models are rooted in behavioural intention. Fishbein and Ajzen (1975) describe behavioural intention as individuals' subjective probability that they will execute a particular behaviour. The TRA postulates that behavioural intention is the key predictor of actual behaviour (Fishbein & Ajzen, 1975). According to the TRA, a person's behavioural intention to execute a particular behaviour is influenced by two determinants: attitude towards act or behaviour and subjective norm, as shown in Figure 2.1.



**Figure 2.1: The TRA (adapted from Fishbein & Ajzen, 1975)**

Attitude towards behaviour is the first determinant of behavioural intention and is described as a person's negative or positive feelings about executing a specific behaviour (Fishbein & Ajzen, 1975). According to Fishbein and Ajzen (1975), people's feelings about performing a particular behaviour are influenced by their outcome

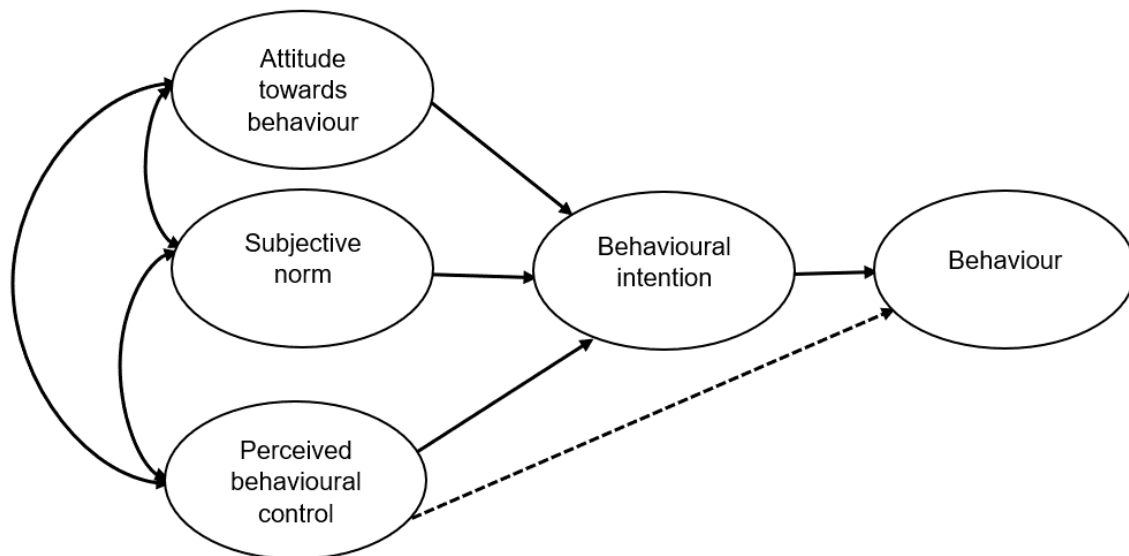
evaluations and behavioural beliefs. Attis (2014) points out that when the TRA is applied to technology acceptance studies, attitude towards technology influences an individual's acceptance of technology and the future behaviour towards technology use. The second determinant of behavioural intention is subjective norm, which refers to an individual's view of what important people believe about whether or not the individual should perform certain behaviour (Al-Mamary et al., 2016). Fishbein and Ajzen (1975) posit that subjective norm is influenced by people's normative beliefs and motivation to comply.

Researchers and scholars investigating technology acceptance have identified some limitations of the TRA. The main limitation of the TRA is its assumption that behaviours are totally under volitional control (Al-Qeisi, 2009; Yusuf & Derus, 2013). This means that people believe that they can perform the behaviour whenever they are willing to do so. Therefore, this assumption does not acknowledge that behaviours might be directed. Another primary limitation of the TRA is its failure to address the role of habit and moral factors (Taherdoost, 2018). Davis et al. (1989) state that the TRA is very general and fails to specify the beliefs that influence attitudes. Furthermore, the TRA includes only subjective norms and attitudes as determinants of behavioural intention and fails to include other determinants such as previous experiences, mood, threat or fear (Momani & Jamous, 2017).

### 2.2.2 The theory of planned behaviour

The TPB was developed by Ajzen (1991) as an extension of the TRA to overcome the limitation of the original TRA in dealing with behaviours over which a person has incomplete volitional control. Ajzen (1991) extended the TRA by adding perceived behaviour control as a determinant of behavioural intention and behaviour. Although both the TRA and the TPB assume that an individual's behavioural intention affects actual behaviour, the TPB uses the construct of perceived behavioural control to account for an individual's behaviour that is not under volitional control (Taherdoost, 2018). Perceived behaviour control is described as an individual's perception of how easy or difficult it is to perform behaviour of interest (Ajzen, 1991). Alkhwalidi and Kamala (2017) point out that two distinct components constitute perceived behaviour control, namely self-efficacy, which is individuals' assessment of their capability to execute certain behaviour, and facilitating conditions, which constitute individuals'

belief whether they have the necessary resources and support to adopt technology. Moreover, the TPB suggests that subjective norm, perceived behavioural control and attitude towards behaviour directly affect behavioural intention, which determines actual behaviour, as depicted in Figure 2.2. In addition, perceived behavioural control has a direct impact on actual behaviour (Taherdoost, 2018).



**Figure 2.2: The TPB (Ajzen, 1991)**

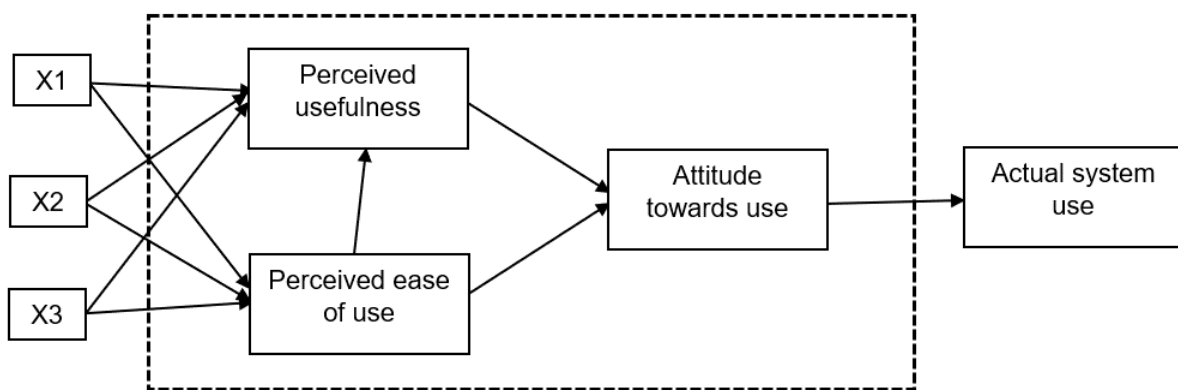
Just like the TRA, the TPB is not without limitations. The TPB has been criticised throughout the years for failing to consider other determinants of behavioural intention and behaviour, such as perceived moral obligation, fear, habit and self-identity (Alkhwaldi & Kamala, 2017; Momani & Jamous, 2017; Teo et al., 2016). Correspondingly, Ajzen and Fishbein (2005) observed that TPB determinants are insufficient in predicting behavioural intentions. Moreover, Taylor and Todd (1995) criticise the TPB for using only perceived behavioural control to acknowledge all non-controllable factors related to behaviours. Furthermore, Rahman et al. (2021) argue that although the TPB suggests that behaviours are planned, it fails to explain the planning mechanisms. Alkhwaldi and Kamala (2017) criticise the TPB for ignoring the demographic characteristics of individuals.

### 2.2.3 The Technology Acceptance Model

The TAM was initially proposed by Davis (1986) for his doctoral study at the Massachusetts Institute of Technology. Davis (1986) developed the TAM as an extension of the TRA to study users' acceptance and use of ISs. In contrast to the



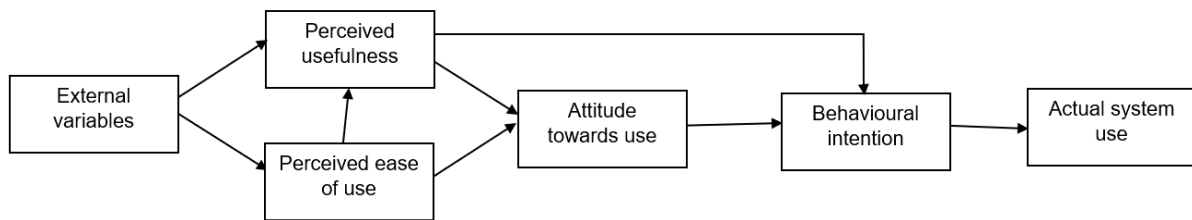
TRA, which was developed to study human behaviour in general, Davis (1986) specifically developed the TAM to study technology acceptance (Momani & Jamous, 2017; Taherdoost, 2018). The original TAM proposes that an individual's motivation to use a certain IS is influenced by three constructs: perceived usefulness, attitude towards using and perceived ease of use, as depicted in Figure 2.3. Davis (1986) assumes that an individual's attitude towards using a system determines whether or not the individual will actually use it. Furthermore, perceived ease of use and perceived usefulness determine an individual's attitude towards using a system, with perceived ease of use influencing perceived usefulness directly. Moreover, the system design characteristics indicated by X1, X2 and X3 have a direct impact on perceived ease of use and perceived usefulness.



**Figure 2.3: The original TAM (Davis, 1986)**

Davis's (1986) TAM was later modified by Davis et al. (1989) with the goal of providing a comprehensive explanation of the factors influencing the acceptance of technology to describe an individual's behaviour across a wide range of computer systems and populations while being both theoretically justified and parsimonious. Davis et al.'s (1989) TAM became the first modified version of the TAM and since its introduction, it has been widely applied by a number of researchers studying the acceptance of use of various technologies (Romli, 2021). Davis et al. (1989) modified the TAM to include the construct of behavioural intention of the TRA. However, they excluded the construct of subjective norm in the TAM, justifying that participants did not have adequate knowledge regarding social influence during the acceptance testing stage (Davis et al., 1989). According to them, the actual use of technology is directly influenced by behavioural intention, which is determined by perceived usefulness and attitude towards use, as demonstrated in Figure 2.4. They further suggest that if users

find a system useful, they may express strong intentions and skip the attitudes construct (Davis et al., 1989).



**Figure 2.4: First modified version of the TAM (Davis et al., 1989)**

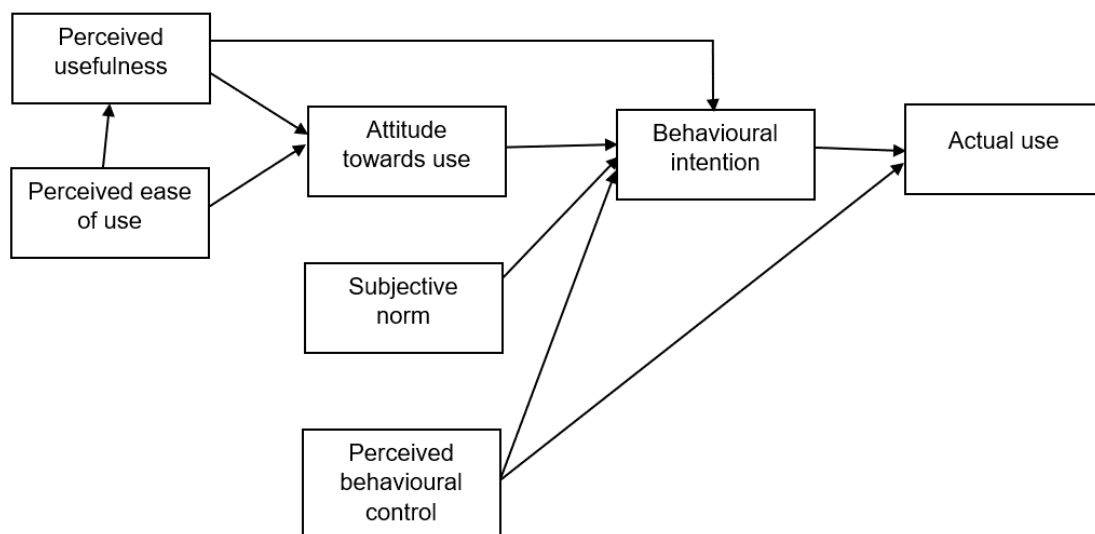
Moreover, Davis et al. (1989) argue that both perceived usefulness and perceived ease of use are influenced by external variables such as the implementation process, system design characteristics, user training and computer self-efficacy. According to Davis (1989), perceived ease of use refers to “the degree to which a person believes that using a particular system would be free of effort”, while perceived usefulness describes “the degree to which a user believes that using the system will enhance his or her job performance” (p. 320). Throughout the years, the TAM remained the most popular and widely applied model for understanding the acceptance and use of IT or ISs in different contexts (Eraslan Yalcin & Kutlu, 2019; Maqsoom et al., 2020; Riza & Hafizi, 2020; Romli, 2021). Many factors contributed to its popularity and widespread use. For example, researchers employing the TAM noted that the model is simple, easy, parsimonious, reliable, robust and well established to adequately explain the acceptance and use of IT or ISs (Ahamed et al., 2020; Diop et al., 2020; Song et al., 2021; Weerasinghe, 2017). Furthermore, the constructs of the TAM have well-validated measuring scales (Manis & Choi, 2019).

Despite the popularity and widespread use of the TAM as a theoretical basis for explaining and understanding the acceptance and use of technology, it has several limitations (Ajibade, 2018; Binyamin, 2019; Malatji et al., 2020). The most-cited limitation of the TAM is its use of only two constructs, namely perceived ease of use and perceived usefulness, in explaining an individual’s behavioural intention to accept technology, hence failing to identify other constructs that may influence behavioural intention (Alshammari & Rosli, 2020; Khan, 2017; Momani & Jamous, 2017). Rahman et al. (2021) observed that the TAM fails to specify how the two constructs influence behaviour. The second limitation of the TAM is related to its explanatory and predictive power of about 40%, which is deemed low (Momani & Jamous, 2017). Another

commonly cited limitation of the TAM is its inconsistency in the relationships between the main constructs; for example, some studies found statistically significant relationships, showing that the TAM is a robust model, whereas others found the opposite (Alabi, 2016; Momani & Jamous, 2017). Moreover, the TAM excluded the construct of subjective norm, which suggests that it has limitations in terms of use outside the workplace (Taherdoost, 2018).

#### 2.2.4 The Combined Technology Acceptance Model and theory of Planned Behaviour

Taylor and Todd (1995) developed the C-TAM-TPB by combining the TAM from the IT field with the TPB from the social psychology field to better understand the factors affecting an individual's behavioural intention to use technology. Specifically, the C-TAM-TPB combines the constructs of behavioural intention, perceived behavioural control, attitude and subjective norm of the TPB with the constructs of perceived usefulness and perceived ease of use of the TAM to provide a hybrid model, as shown in Figure 2.5.



**Figure 2.5: The C-TAM-TPB (Taylor & Todd, 1995)**

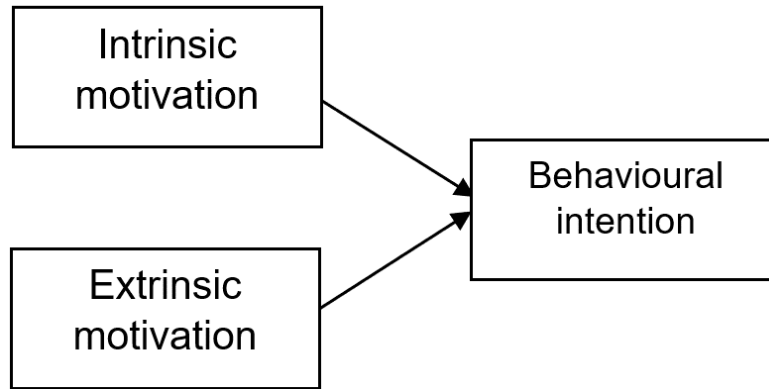
The C-TAM-TPB posits that the actual use of technology is determined by behavioural intention, which, in turn, is affected by perceived behavioural control, perceived usefulness, subjective norm and attitude towards use. In addition, perceived behavioural control directly affects the actual use of technology in addition to its indirect influence through behavioural intention. Furthermore, perceived ease of use has a direct influence on perceived usefulness and both perceived ease of use and perceived usefulness are determinants of attitude towards use. According to Taylor

and Todd (1995), the relationships among the C-TAM-TPB constructs are moderated by users' experience. Consequently, the C-TAM-TPB is suitable for predicting technology use of both inexperienced and experienced users (Alkhwaldi & Kamala, 2017; Khan, 2017). This was a significant contribution by the C-TAM-TPB to the field of technology acceptance (Morchid, 2020).

Although the C-TAM-TPB was developed to overcome the limitations in using a single theory, it is also associated with some limitations. Rahman et al. (2021) state that the combined model does not consider the planning factors of a person's behaviours. Khan (2017) indicates that although the combined model integrated the advantages of the TAM and the TPB, it does not have broader acceptance. Another limitation of the C-TAM-TPB is that it disregards the variables of age, gender and seniority (Morchid, 2020). Moreover, Rahman et al. (2021) argue that incorporating the constructs of perceived ease of use from the TAM and subjective norm from the TPB in the combined model was useful, but that the model was still had limitations.

#### 2.2.5 The Motivational Model

Based on the self-determination theory of Deci and Ryan (1985), Davis et al. (1992) developed the MM to study technology adoption and use. The MM posits that a person's behaviour is based on extrinsic and intrinsic motivations, as demonstrated in Figure 2.6. Davis et al. (1992) investigated both intrinsic and the extrinsic motivations for using computers in the workplace and found that both are important determinants of an individual's behavioural intention to adopt and use computers. Intrinsic motivation is defined as behaviour that causes a person to experience joy and satisfaction after engaging in a particular activity (Davis et al., 1992; Taherdoost, 2018). Examples of intrinsic motivation include perceived enjoyment and playfulness (Davis et al., 1992).



**Figure 2.6: The MM (Cocosila et al., 2009)**

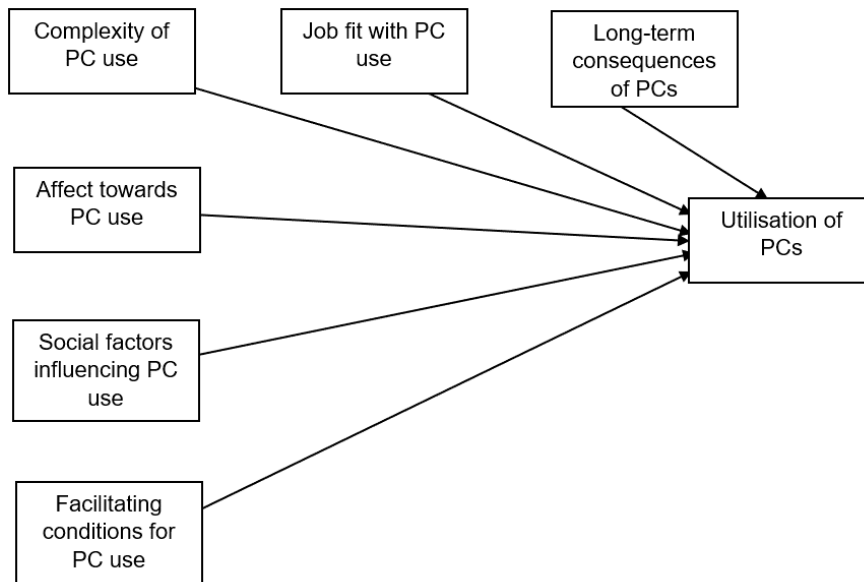
Extrinsic motivation is described as the belief that people will want to perform a certain activity because it is considered to help them achieve valuable outcomes that are unrelated to the activity, such as improved job performance (Davis et al., 1992; Momani & Jamous, 2017). Examples of extrinsic motivation are subjective norm, perceived ease of use and perceived usefulness (Davis et al., 1992). Davis et al. (1992) noted the relationship between perceived enjoyment and perceived usefulness. According to them, a positive interaction between perceived enjoyment and perceived usefulness shows that perceived enjoyment has a substantial impact on behavioural intention when technology is perceived to be more useful (Davis et al., 1992). In other words, increased enjoyment of technology improves the acceptance of useful technology.

The most commonly reported limitation of the MM is that it is more effective when applied to healthcare, learning and motivational studies, but its application to technology acceptance studies is ineffective (Momani & Jamous, 2017; Rahman et al., 2021). Momani and Jamous (2017) point out that the MM still needs to incorporate other factors to become more relevant to study technology acceptance and use. Another widely cited drawback of the MM is that it has a low explanatory power of about 28% for behavioural intention (Alkhwaldi & Kamala, 2017). Furthermore, the MM does not have moderators (Alkhwaldi & Kamala, 2017).

### 2.2.6 The Model of Personal Computer Utilisation

Thompson et al. (1991) developed the MPCU based on Triandis's (1977) theory of interpersonal behaviour to predict an individual's acceptance and utilisation of personal computers (PCs). The MPCU comprises six determinants of PC utilisation:

complexity, social factors, job fit, facilitating conditions, affect and long-term consequences (Thompson et al., 1991). As shown in Figure 2.7, the construct of behaviour intention was excluded in the MPCU because the model studies the actual utilisation of PCs. In addition, the construct of habit was excluded in the model, as it has a tautological relationship with PC utilisation (Taherdoost, 2018).



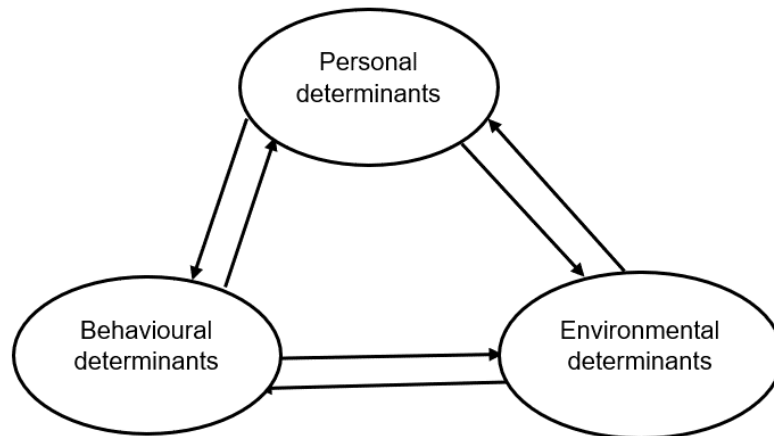
**Figure 2.7: The MPCU (Thompson et al., 1991)**

Thompson et al. (1991) define job fit as the degree to which people believe that using a computer would improve their job performance. Complexity is described as the extent to which an innovation is viewed as somewhat challenging to understand and use (Thompson et al., 1991). Social factors refer to the extent to which individuals believe that a significant other think they should use a computer (Venkatesh, et al., 2003). Facilitating conditions are the provision of computer support, and long-term consequences describe the outcomes with a future payoff (Thompson et al., 1991). The MPCU primarily deals with the extent of PC utilisation by workers where the use is not enforced by the organisation but is at the user’s discretion. In such a situation, the model suggests that workers’ PC utilisation is influenced by their attitudes, habits, social norms and the expected repercussions of their actions (Sharma & Mishra, 2014; Thompson et al., 1991). Moreover, the model assumes that users have the necessary computer experience, such as managers or professionals who usually use computers voluntarily in their professions (Momani & Jamous, 2017).

The MPCU made a critical contribution to the field of technology acceptance and use. Morchid (2020) argues that the MPCU not only reorients existing research to the context of computer use, but also pioneers the exploration of unexplored patterns of behaviour and attitudes. Several limitations of the MPCU have been identified. Firstly, the model is successful in explaining and understanding the acceptance and use of PCs in a voluntary context, but it does not explain the indirect influence of the construct of complexity on perceived short-term consequences (Momani & Jamous, 2017; Rahman et al., 2021). Secondly, although the affect construct is proposed as an important determinant of PC usage, it has many manifestations, and the manner in which these manifestations influence PC utilisation are not thoroughly explored (Morchid, 2020). Thirdly, it is impossible to isolate and trace the effects of facilitating conditions and social factors to their respective source codes (Morchid, 2020). Finally, the model has low a explanatory power of approximately 24% (Alkhwaldi & Kamala, 2017).

#### 2.2.7 Social cognitive theory

SCT originated from Miller and Dollard's (1941) social learning theory when they introduced modelling into the learning principle. Bandura created SCT in 1986 as a consequence of his ongoing work, which began in the 1960s, to enhance social learning theory into a powerful theory of human behaviour (Momani & Jamous, 2017). SCT proposes that learning occurs in a social setting, with a triadic, dynamic and bidirectional interaction of behavioural, environmental and personal factors, as shown in Figure 2.8. According to this theory, the environmental component focuses on both the social and the physical components that are physically external to the person, while the behavioural component is primarily concerned with issues of usage, performance and adoption (Taherdoost, 2018). The personal component comprises any demographic, cognitive or personality characteristic of an individual (Taherdoost, 2018). Moreover, SCT is an interconnected triadic framework in which all three components are continually influencing one another.



**Figure 2.8: SCT (Bandura, 1986)**

Compeau and Higgins (1995) extended SCT to the field of IT to study the acceptance and use of technology. They extended SCT to a model of technology acceptance to measure the construct of self-efficacy and its influence on behaviour (Momani & Jamous, 2017). According to them, self-efficacy refers to people’s assessment of their competence to use technology to complete a certain task (Compeau & Higgins, 1995). Furthermore, Compeau and Higgins’s (1995) model used computer usage as a dependent variable.

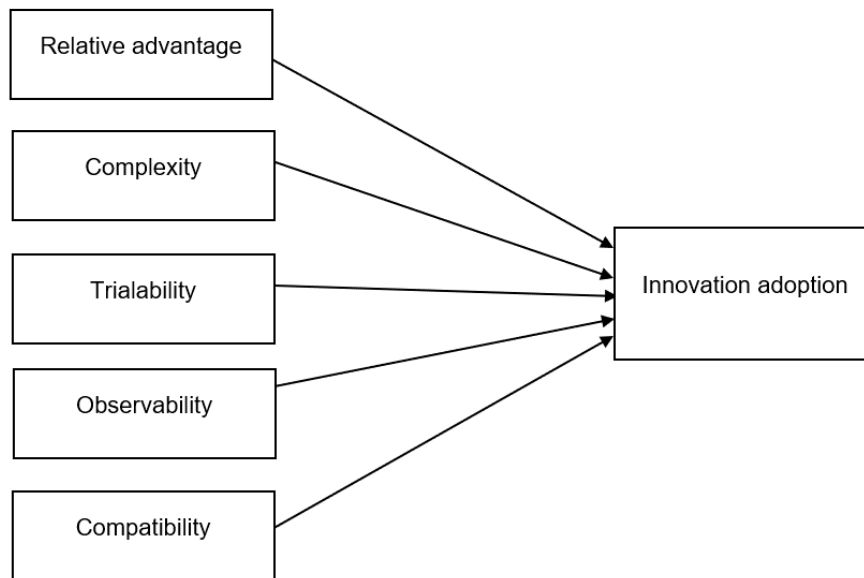
SCT is not well-organised, especially when studying the relationships between the constructs of environmental, behavioural and individual determinants (Momani & Jamous, 2017; Rahman et al., 2021). In addition, it is not clear which of the three constructs is more influential than the other (Momani & Jamous, 2017; Rahman et al., 2021). Another limitation of SCT was pointed out by Morchid (2020), who argues that although the self-efficacy construct is the most important construct of Compeau and Higgins’s (1995) model, it presents measurement difficulties. In the same vein, Alkhwaldi and Kamala (2017) state that although SCT incorporated the construct of self-efficacy, generalising the theory is a challenging task. Furthermore, SCT has a low explanatory power of approximately 32% (Alkhwaldi & Kamala, 2017).

### 2.2.8 Innovation diffusion theory

Rogers (1995) developed IDT from sociology, intending to study the adoption of new technologies. Rogers (1995) distinguished the diffusion and adoption processes, as the main focus of this theory was how innovations are diffused and adopted in society at both the organisational and the individual levels. For Rogers (2003), diffusion is “the



process in which an innovation is communicated through certain channels over time among the members of a social system”, while adoption is a decision of “full use of an innovation as the best course of action available” (p. 177). IDT postulates that the adoption rate of innovation is influenced by observability, trialability, complexity, compatibility and relative advantage, as illustrated in Figure 2.9.



**Figure 2.9: IDT (Rogers, 1995)**

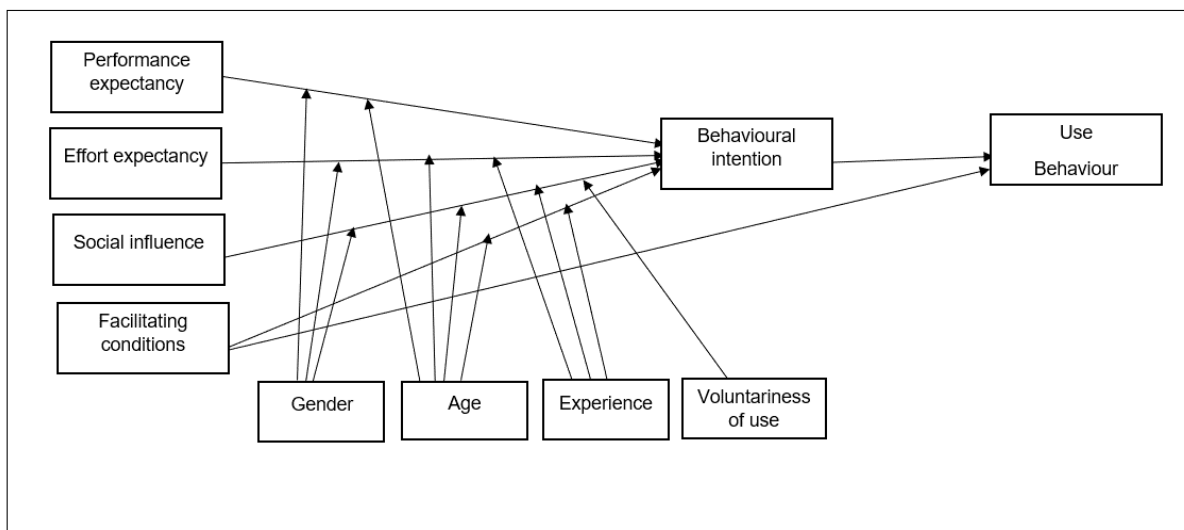
According to Rogers (1995), relative advantage refers to the extent to which an innovation is thought to be superior to the idea it replaces. Trialability is defined as the degree to which individuals think that they need to test the technology before deciding to adopt it or not (Al-Rahmi et al., 2019). Complexity is concerned with the level of difficulty in understanding and using the technology (Jensen, 2020). Compatibility is the extent to which potential adopters consider an innovation to be compatible with their current values, prior experiences and needs (Al-Rahmi et al., 2019). Observability refers to how noticeable the outcome of the innovation is to others (Al-Rahmi et al., 2019).

The theory describes innovation decisions and predicts the rate of innovation, but does not indicate how attitudes influence decisions whether or not to adopt innovation or how innovation affects adoption decisions (Alkhwaldi & Kamala, 2017; Momani & Jamous, 2017; Rahman et al., 2021). In addition, the theory has a low explanatory power and is less practical in predicting outcomes (Alkhwaldi & Kamala, 2017; Taherdoost, 2018). Al-Mamary et al. (2016) state that IDT lacks appropriate

components to address collective adoption behaviours. Moreover, the theory focuses only on innovation, ignoring other elements that influence how the innovation is adopted (Alkhwaldi & Kamala, 2017; Al-Mamary et al., 2016).

### 2.2.9 Unified Theory of Acceptance and Use of Technology

Venkatesh et al. (2003) developed the UTAUT by integrating key constructs from eight technology acceptance theories and models previously used in the fields of IT and IS. These theories and models include the TRA, TPB, STC, IDT, TAM, C-TAM-TPB, MM and MPCU. The UTAUT sought to provide a more comprehensive picture of the technology acceptance process than any prior theory or model could provide on its own (Alkhwaldi & Kamala, 2017). According to Venkatesh et al. (2003), the UTAUT is superior to prior theories and models of technology acceptance, as it can explain up to 70% of the variance in adoption behaviour. In contrast, previous technology acceptance models and theories could only explain between 30% and 40% of the variance (Venkatesh et al., 2003). The UTAUT comprises four main constructs (social influence, performance expectancy, facilitating conditions and effort expectancy) and four moderators (experience, age, gender and voluntariness of use) that are linked to predicting behavioural intention and actual use of IT or ISs, as depicted in Figure 2.10.



**Figure 2.10: The UTAUT (Venkatesh et al., 2003)**

The UTAUT theorises that social influence, effort expectancy and performance expectancy directly influence behavioural intention, whereas facilitating conditions and behavioural intention directly determine the actual use of IT or ISs (Venkatesh et al.,

2003). Performance expectancy refers to the assumption that by using the technology, job performance would improve (Chao, 2019; Venkatesh et al., 2003). This construct is similar to other constructs in other technology acceptance theories and models, such as outcome expectancy in SCT, relative advantage in IDT, job fit in the MPCU, extrinsic motivation in the MM and perceived usefulness in both the TAM and the C-TAM-TPB. Venkatesh et al. (2003) suggest that performance expectancy is the most important predictor of technology utilisation. Effort expectancy describes how easy it is to use a technology (Chao, 2019; Venkatesh et al., 2003). Effort expectancy is tantamount to complexity in IDT and the MPCU as well as perceived ease of use in the TAM.

Facilitating conditions reflect users' belief that organisational infrastructure exists that supports them in using IT or ISs (Khechine et al., 2020). The antecedents of facilitating conditions in other theories and models of technology acceptance are compatibility in IDT, facilitating conditions in the MPCU and perceived behavioural control in both the TPB and the C-TAM-TPB. The construct of social influence measures the extent to which the beliefs of others have an impact on a user's decision to use technology (Chao, 2019). It is analogous to image in IDT, social factors in the MPCU and subjective norms in the C-TAM-TPB, TPB, and TRA. Venkatesh et al. (2003) posit that social influence would only be significant if the use of technology is mandatory.

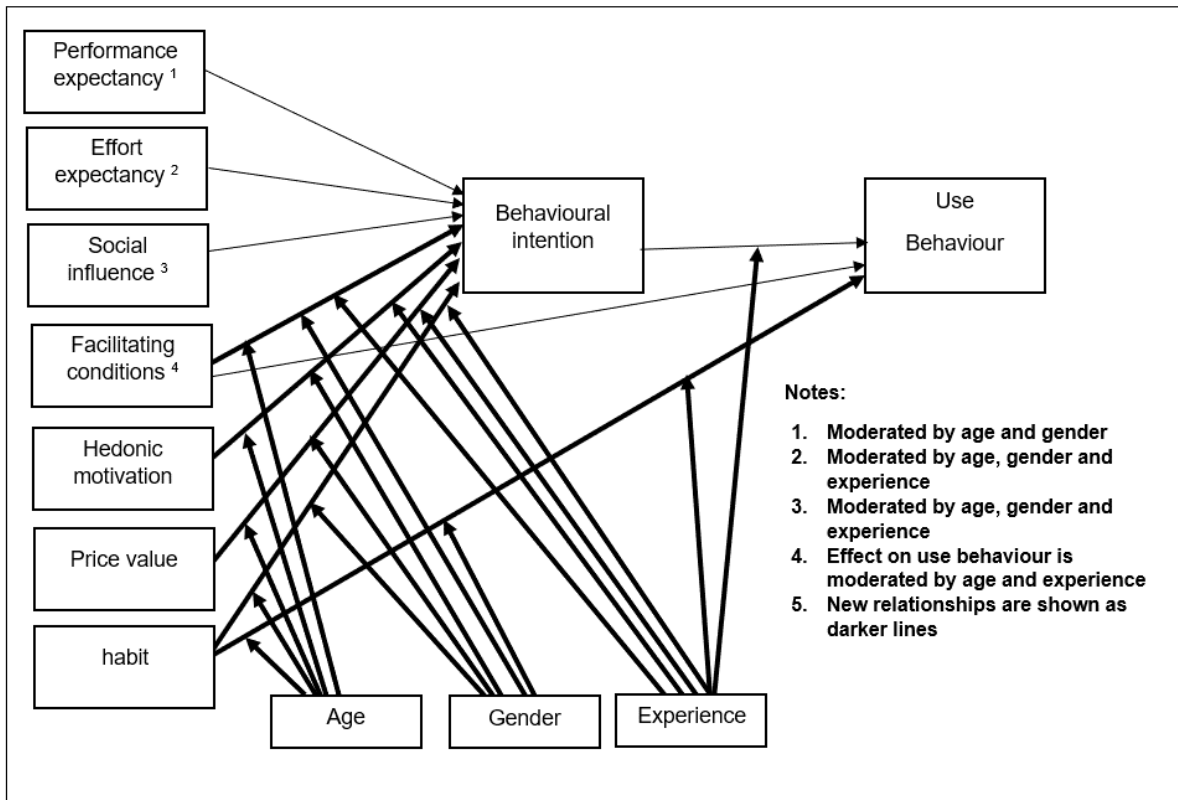
Similar to previous theories and models of technology acceptance, the UTAUT is not without limitations (Alkhwaldi & Kamala, 2017; Morchid, 2020). Despite the fact that the UTAUT has gained widespread acceptance, there are concerns about its capacity to explain users' technology acceptance (Chao, 2019). One of the main limitations of the UTAUT is that it uses many independent variables for predicting behavioural intention and use behaviour (Bagozzi, 2007). Casey and Wilson-Evered (2012) reported that the UTAUT is too complicated, not a parsimonious model and cannot explain a user's behaviour. Morchid (2020) state that the UTAUT was developed and validated in a specific setting and therefore it cannot be applicable to every setting.

#### 2.2.10 The Unified Theory of Acceptance and Use of Technology 2

This study applied the UTAUT2 as a theoretical underpinning to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for ERT. UTAUT2 was developed by Venkatesh et al. (2012) as an extension of the UTAUT to

examine technology acceptance in consumer setting. However, since its publication, the UTAUT2 has been widely used to study factors influencing users' acceptance and use of various technologies, not only in consumer contexts, but in various other contexts as well (Alkhwaldi & Kamala, 2017). According to Alkhwaldi and Kamala (2017), the UTAUT2 is superior to the UTAUT, as it can explain up to 74% of the variance in behavioural intention and use behaviour. The UTAUT2 includes the constructs of the UTAUT (i.e. social influence, effort expectancy, facilitating conditions and performance expectancy) and other three additional constructs, namely habit, price value and hedonic motivation, as determinants of behavioural intention and use behaviour, as shown in Figure 2.11. In other words, the UTAUT2 postulates that, in addition to the four main constructs of the UTAUT, an individual's behavioural intention to use IT or ISs is determined by habit, price value and hedonic motivation (Venkatesh et al., 2012).

Furthermore, the UTAUT2 includes the moderating variables of experience, gender and age of the UTAUT, but excludes voluntariness (Venkatesh et al., 2012). However, in this study, the moderator effect variables were not investigated. The age, experience and gender variables have been frequently reported in the literature as having no significant moderation effect in digital learning platforms and LMS acceptance studies (Cavus et al., 2021; Ting & Aziz, 2021; Tinmaz & Lee, 2020; Widjaja et al., 2020).



**Figure 2.11: The UTAUT2 (Venkatesh et al., 2012)**

Venkatesh et al. (2012) adapted the definitions of social influence, effort expectancy, facilitating conditions and performance expectancy from the UTAUT in the UTAUT2. They define social influence as the degree to which “consumers perceive that important others (e.g. family and friends) believe they should use a particular technology”, effort expectancy as “the degree of ease associated with consumers’ use of technology”, facilitating conditions as “consumers’ perceptions of the resources and support available to perform a behaviour” and performance expectancy as the extent to which “using a technology will provide benefits to consumers in performing certain activities” (Venkatesh et al., 2012, p. 159). Hedonic motivation denotes the joy or pleasure derived from using technology (Al-Azawei & Alowayr, 2020). Hedonic motivation is regarded as the most significant theoretical contribution to the UTAUT2, as it incorporates the much-needed affective construct (Tamilmani et al., 2019). Habit refers to the extent to which a person performs behaviours automatically in the learning process (Moorthy et al., 2019). Cheng et al. (2020) state that the development of habitual use among users remains an important factor in the continued use of technologies.

Price value refers to an individual's perception of the trade-off between perceived advantages and the monetary cost for using a technology (Moorthy et al., 2019). However, in this study, the price value construct was not investigated. The price value construct is a significant factor where consumers bear the cost of purchasing the technology (Gunasinghe et al., 2020). However, in this study, it was excluded due to its low relevance, as no direct costs are imposed on teachers by the WhatsApp developers for using WhatsApp for ERT. In addition, although WhatsApp relies on internet connectivity to send and receive messages, there are no direct costs imposed on teachers by the WhatsApp developers, as WhatsApp is free to use. In contexts where price is relevant, it influences the perception of value (Shaw & Sergueeva, 2019). For example, when buying a technological device, the benefits or quality is "weighed against the price to be paid" (Shaw & Sergueeva, 2019, p. 47). Therefore, as in other educational studies that employed the UTAUT2 (Dajani & Hegleh, 2019; Zwain, 2019), the price value construct was less relevant in the context of this study. Instead, this study replaced the price value construct with the teaching value construct.

In a study investigating the influence of learning value on LMS use, Ain et al. (2015) replaced the price value construct with learning value. The researchers acknowledge Venkatesh et al.'s (2012) definition of price value and define learning value as the "cognitive trade-off between the perceived value of LMS, and time and effort spent for using it" (Ain et al., 2015, p. 6). Therefore, in this study, the researcher conceptualised teaching value as the cognitive trade-off between the perceived value of WhatsApp and the time and effort spent using it. Teachers are not imposed direct costs for using WhatsApp for ERT, as it is a free messaging application. However, the time and effort devoted to using it for teaching are of value for them.

The current study applied the UTAUT2 as a guiding theoretical framework for the following five reasons. Firstly, the UTAUT2 is a robust theory incorporating core constructs from eight individual models and theories of technology acceptance and can explain up to 74% of the variance in behavioural intention compared to other models and theories of technology acceptance (Alkhwaldi & Kamala, 2017). Previous studies have verified this strong explanatory power, which resulted in a significant improvement and parsimonious structure of the UTAUT2 compared to earlier models and theories of technology acceptance (Alkhwaldi & Kamala, 2017; Kol et al., 2021). Secondly, it is considered the most recent theory for studying technology acceptance

(Tamilmani et al., 2020). Thirdly, it has been widely employed to investigate factors influencing the acceptance and use of various technologies in different contexts (Aburumman, 2021; Nikolopoulou et al., 2020; Wu & Lee, 2017). In addition, the UTAUT2 provides a good theoretical basis for understanding factors influencing the acceptance and use of technology (Venkatesh et al., 2012). Fourthly, it has high validity and reliability, as reported by Amadin et al. (2018). Lastly, the theory overcomes the limitations identified in the UTAUT and previous models and technology acceptance theories (Alkhwaldi & Kamala, 2017).

A review of the literature identified several studies on technology acceptance that have used the UTAUT2 to investigate the factors influencing the acceptance and use of numerous technologies in different settings and cultures (Castanha & Pillai, 2021; Susilowati, 2021). A study by Avci (2022) examined the factors that affect teachers' acceptance and use of digital learning resources for teaching in Turkey and found that performance expectancy, hedonic motivation and habit affected teachers' behavioural intention to accept and use digital learning resources for teaching. Their results also showed that effort expectancy, social influence, facilitating conditions and price value had an insignificant influence on teachers' behavioural intention to accept and use digital learning resources for teaching.

A similar study based on the UTAUT2 conducted by Al-Abdullatif and Alsubaie (2022) investigated the factors that have an impact on teachers' behavioural intention to accept and use digital learning platforms for teaching in Saudi Arabia. Their results showed that performance expectancy, effort expectancy, price value, hedonic motivation and habit had a significant impact on teachers' behavioural intention to accept and use digital learning platforms for teaching. Their results also revealed that social influence, facilitating conditions and price value had no significant impact on teachers' behavioural intention to accept and use digital learning platforms for teaching.

In a study investigating the factors influencing medical education students' behavioural intention to use blended learning in Iran, Azizi et al. (2020) found that habit, hedonic motivation, effort expectancy, price value, facilitating conditions, performance expectancy and social influence had a substantial impact on students' behavioural intention to use blended learning. In addition, students' behavioural intention to use

blended learning had a substantial impact on the actual use of blended learning. The researchers further concluded that the UTAUT2 had much potential to identify the elements that influence students' behavioural intention to use blended learning. In another study based on the UTAUT2 investigating factors affecting students' behavioural intention and actual use of mobile learning systems in Sri Lanka, Nawaz and Mohamed (2020) found that hedonic motivation, facilitating condition, habit, effort expectancy and performance expectancy had a significant impact on students' behaviour intention to use mobile learning systems. The results for social influence were, however, not significant.

A study by Raman and Thannimalai (2021) also applied the UTAUT2 to investigate the factors that might have an impact on students' behavioural intention to use online learning during the Covid-19 pandemic at the University Utara Malaysia. The results showed that habit and social influence significantly influenced students' behavioural intention to use online learning. However, contrary to their expectation, the results revealed that price value, hedonic motivation, facilitating conditions, effort expectancy and performance expectancy did not influence students' behavioural intention to use online learning. Furthermore, the results indicated that habit was the greatest predictor for behavioural intention. In a similar study on factors influencing students' behavioural intention to use online learning in Iraq, in which the UTAUT2 was applied as a theoretical basis, Jameel et al. (2020) found that habit, facilitating conditions, effort expectancy and performance expectancy had a positive and significant impact on students' behavioural intention to use online learning. However, the results for price value, hedonic motivation and social influence were insignificant.

Widjaja et al. (2019) extended the UTAUT2 with the trust construct to identify the factors influencing university lecturers' acceptance and use of LMSs. The findings showed that trust, habit and performance expectancy had a substantial impact on behavioural intention. The findings further indicated that behavioural intention and habit had a significant influence on the actual use of LMSs. In a similar study, Widjaja et al. (2020) extended the UTAUT2 with the construct of trust to evaluate students' acceptance and use of LMSs. The results showed that hedonic motivation, facilitating conditions, habit and social influence had a significant influence on students' behavioural intention to use LMSs. Interestingly, the results revealed that trust, effort expectancy, price value and performance expectancy had no influence on behavioural



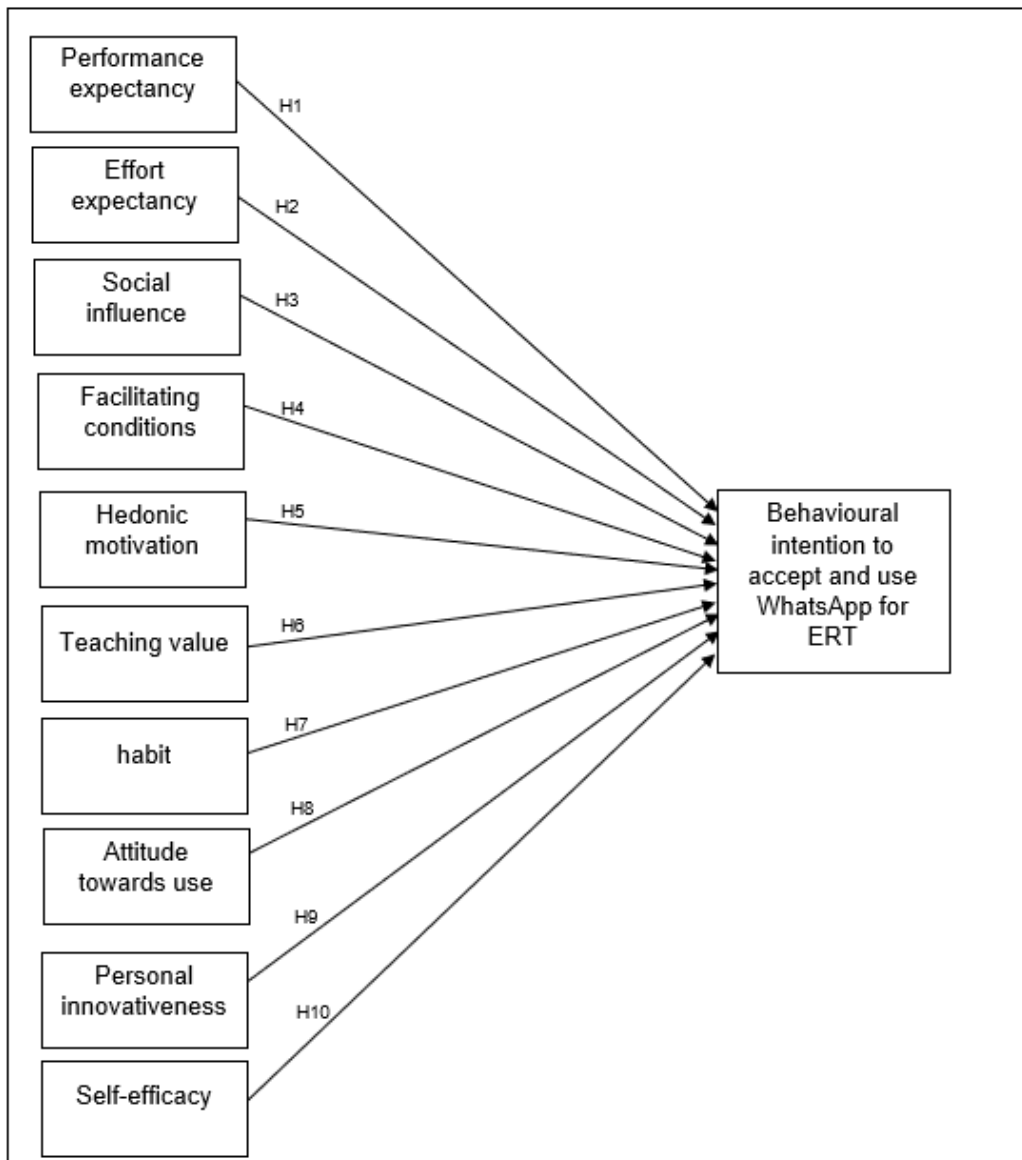
intention. Moreover, the results indicated that behavioural intention, habit and facilitating conditions influenced actual use of LMSs.

Khan et al. (2021) investigated factors influencing instructors' adoption of LMSs at Saudi Arabian higher education institutions. Their research model was based on the UTAUT2. The results revealed that habit, social influence and facilitating conditions influenced instructors' adoption of LMSs. The results also identified performance expectancy and effort expectancy as important factors for LMS acceptance and adoption, respectively. Another study based on the UTAUT2 conducted to understand factors affecting students' acceptance of mobile learning in Pakistan, Arain et al. (2018) reported that students' behavioural intention to use mobile learning was positively influenced by personal innovativeness, ubiquity, hedonic motivation, habit, facilitating conditions and performance expectancy, while effort expectancy positively influenced performance expectancy.

### **2.3 PROPOSED EXTENSION OF THE UTAUT2 AND HYPOTHESES**

The UTAUT2 is the most recent and comprehensive theory for studying technology acceptance in various contexts (Tamilmani et al., 2020). Alkhwaldi and Kamala (2017) state that extending and employing the UTAUT2 would be considered a significant theoretical contribution in the field of technology acceptance. Venkatesh et al. (2012) suggest that future studies should seek to discover more important constructs to extend the UTAUT2. Therefore, the present study applied and extended the UTAUT2 to investigate factors influencing secondary school teachers' acceptance and use of WhatsApp for ERT. The extended UTAUT2 included 11 constructs, namely performance expectancy, effort expectancy, social influence, facilitation conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention. These constructs are appropriate for investigating factors influencing the acceptance and use of social learning platforms (Khechine & Augier, 2019), LMSs (Khan, 2018; Sharif et al., 2019) and mobile learning (Arain et al., 2019; Chao, 2019; Cheng et al., 2020). Although the moderator impact of gender, age and experience is included in the UTAUT2, the age, experience and gender variables have been frequently reported in the literature as having no substantial moderating impact in digital learning platforms and LMS acceptance studies (Cavus et al., 2021; Ting & Aziz, 2021; Tinmaz & Lee, 2020;

Widjaja et al., 2020). Therefore, the moderator effect variables were not investigated in this study. Figure 2.12 presents the proposed extension of the UTAUT2 that explains the variables that influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT and the hypothesised relationships between the variables.



**Figure 2.12: Proposed extension of the UTAUT2 and hypotheses**

### 2.3.1 Performance expectancy

Performance expectancy is recognised as one of the critical determinants in the acceptance and use of technology (Onaolapo & Oyewole, 2018; Shatta & Shayo, 2021; Venkatesh et al., 2012). Previous studies found performance expectancy as the

most important factor that could influence users' behavioural intentions to use technology (Abbad, 2021; Alaiad et al., 2019; Jeon et al., 2020; Ryu & Fortenberry, 2021). According to Venkatesh et al. (2003), the theoretical foundation of performance expectancy stems from the constructs of outcome expectations, relative advantage, job fit, extrinsic motivation and perceived usefulness. Performance expectancy is described by Venkatesh et al. (2012) as the degree to which using a technology will benefit users in executing specific tasks. In the context of the current study, it describes secondary school teachers' beliefs that using WhatsApp for ERT would benefit them. In this study, performance expectancy comprised four main indicators: usefulness, quickness, productivity and promotion of teaching goals.

Usefulness is the first indicator of performance expectancy and refers to the benefits users enjoy from using technology in their daily lives (Venkatesh et al., 2012). In this study, usefulness describes secondary school teachers' beliefs about the usefulness of WhatsApp for ERT. Quickness is the second indicator, which refers to the degree to which technology allows users to do tasks quickly (Venkatesh et al., 2012). In this study, quickness denotes secondary school teachers' belief that using WhatsApp for ERT would enable them to accomplish teaching tasks more quickly. Productivity is the third indicator of performance expectancy and refers to the extent to which people assume that using technology will assist them in improving job performance (Venkatesh et al., 2012). For this study, productivity describes the extent to which secondary school teachers believed that using WhatsApp for ERT would increase their teaching productivity. Moreover, if secondary school teachers believe that using WhatsApp for ERT is useful, quick and significantly improves their teaching performance, they may be more inclined to use it.

In technology acceptance research, performance expectancy is known to positively affect an individual's behavioural intention to use a technology, and several studies have confirmed this relationship (Muangmee et al., 2021; Venkatesh et al., 2012; Yeop et al., 2019). For example, in a study on investigating the factors affecting university lecturers' acceptance and use of MOOCs in Taiwan where the UTAUT2 was employed as the guiding theoretical framework, Tseng et al. (2019) reported that performance expectancy had a significant influence on teachers' behavioural intention to adopt MOOCs. Another study based on the UTAUT2 by Mittal et al. (2021) used time-series analysis to investigate the factors influencing lecturers' adoption of online teaching in

India. Data were collected in two phases using an online survey. In the first phase of data collection, data were gathered from lecturers who had no prior experience of online teaching but were expected to adopt it due to the Covid-19 pandemic. In the second phase of data collection, the same group of lecturers who were implementing online teaching completed the same online survey with slightly modified scale items to understand their opinions on their adoption of online teaching. The results revealed that performance expectancy significantly influenced lecturers' behavioural intention to adopt online teaching in both phases.

Tandon (2020) also employed the UTAUT2 to probe the factors influencing school teachers' adoption of online teaching in India. The findings indicated that performance expectancy had a positive impact on school teachers' behavioural intention to adopt online teaching. A study by Dindar et al. (2021) used the UTAUT to compare K-12 teachers' acceptance of LMSs in Finland. Teachers were split into two groups: the experienced and inexperienced groups. The experienced group used the LMS for teaching prior to the Covid-19 pandemic, whereas the inexperienced group began using it for ERT. The findings indicated that performance expectancy had a significant impact on the behavioural intentions of both groups. In another study in Greece, Nikolopoulou et al. (2021) reported similar results after investigating the factors that could have an impact on teachers' intentions to use mobile internet in the educational process, namely that performance expectancy had a significant impact on teachers' intentions to use mobile internet.

In South Africa, Machingambi and Batchelor (2019) used the UTAUT2 to probe the factors that influence pre-service teachers' acceptance and use of a synchronous collaboration application called VIA App to support teaching and learning and found that performance expectancy significantly influenced pre-service teachers' behavioural intention to accept and use VIA App. Therefore, in this study, it was believed that secondary school's behavioural intention to accept and use WhatsApp for ERT was built upon their positive perception of the usefulness of WhatsApp for implementing ERT. To understand this relationship, the following hypothesis was proposed:

**H1:** Performance expectancy influences behavioural intention to accept and use WhatsApp for ERT.

### 2.3.2 Effort expectancy

Effort expectancy is a critical construct that influences individuals' acceptance and use of technology in different contexts such as online learning (Abbad, 2021), mobile learning (Chao, 2019), mobile banking (Marpaung et al., 2021) and e-government (Mutaqin & Sutoyo, 2020). Venkatesh et al. (2003) derived the construct of effort expectancy from the constructs of complexity and perceived ease of use and describe it as the degree of ease with which technology can be used. Ogunsola and Olojo (2021) postulate that effort expectancy is founded on the assumption that there are links between the amount of effort put in at work, the results of that effort and the rewards obtained as a result of that effort. In the present study, effort expectancy refers to the extent to which secondary school teachers believed that using WhatsApp for ERT was easy and effortless. It denotes secondary school teachers' level of expectation that using WhatsApp for ERT would not be characterised by mental or physical efforts. It also describes the easiness that secondary school teachers experienced when using WhatsApp for ERT. The effortlessness and easiness were the indicators of effort expectancy in this study. It was expected in this study that the easiness and user friendliness of using WhatsApp for ERT would influence secondary school teachers' behavioural intention to accept and use the application.

Effort expectancy has a direct influence on secondary school teachers' behavioural intention to use WhatsApp for ERT. This is because secondary school teachers' use of WhatsApp for ERT is likely to be influenced by how simple or difficult it is to teach using WhatsApp. Therefore, if secondary school teachers discover how simple it is to use WhatsApp for ERT, they will be more likely to accept it and continue using it. Several past studies reported that effort expectancy positively influences behavioural intention to use WhatsApp (Balasundran et al., 2021; Bere, 2014; Fernández-Robin et al., 2017; Fernández-Robin et al., 2019; Morchid, 2019). Pham et al. (2020) conducted a study based on the factors influencing lecturers' behavioural intention to use IT for teaching. Their study aimed to identify the factors influencing lecturers' behavioural intention and use of IT based on the UTAUT framework. Data were collected from 186 lecturers from an economic university in Vietnam who completed a questionnaire. The results showed that effort expectancy had a direct and positive influence on lecturers' behavioural intention to use IT for teaching.

In another study where the UTAUT2 was applied to examine the factors influencing secondary school teachers' behavioural intentions to use mobile technology for teaching and learning in Nigeria, Funmilola et al. (2019) reported that secondary school teachers' behavioural intentions to use mobile technology for teaching and learning were positively influenced by effort expectancy. In this study, it was believed that secondary school teachers' perception that using WhatsApp for ERT was free from effort led to their behavioural intention to accept and use WhatsApp for ERT. Therefore, the following relationship was hypothesised:

**H2:** Effort expectancy influences behavioural intention to accept and use WhatsApp for ERT.

### 2.3.3 Social influence

Social influence measures individuals' beliefs of how their important others (e.g. family and friends) will perceive their behaviour concerning technology acceptance and use (Joa & Magsamen-Conrad, 2021). It is similar to the constructs of subjective norm, social factors and image (Venkatesh et al., 2003). In this study, social influence describes the extent to which secondary school teachers felt that significant others (e.g. colleagues, family and the school's stakeholders) believed that they should use WhatsApp for ERT. Therefore, in this study, social influence consisted of two indicators, namely social factor and subjective norm. Social factor refers to the extent of influence of people (e.g. family) who are close to secondary school teachers in terms of using WhatsApp for ERT (Venkatesh et al., 2003). Subjective norm refers to the influence of significant people (e.g. colleagues and the school's stakeholders) who relate to secondary school teachers in terms of the use of WhatsApp for ERT (Venkatesh et al., 2012).

Bagozzi and Lee (2002) posit that people are more likely to use certain technology if it comes highly recommended by others who are important to them. Therefore, secondary school teachers are more likely to use WhatsApp for ERT if they get a recommendation from their colleagues, family and the school's stakeholders. Ajzen (1991) maintains that when behaviours are socially accepted, they are more likely to be repeated through intention. Venkatesh et al. (2012) posit that social influence has a distinct effect on behavioural intention, depending on whether the setting is mandatory or voluntary. In a mandatory setting, social influence has a direct effect on

behavioural intention; however, in a voluntary setting, the link between social influence and behavioural intention is indirect (Venkatesh et al., 2012). Several previous studies have validated social influence as a significant factor that influences individuals' behavioural intentions (Fernández-Robin et al., 2019; Maphosa et al., 2020; Muangmee et al., 2021; Walrave et al., 2021).

In a study on the factors influencing lecturers' and students' acceptance of Moodle in Iraq, Zwain (2019) found that social influence had a significant positive influence on lecturers' intentions to accept Moodle. In a similar study in Iraq, Zwaina and Haboobib (2019) investigated the factors influencing students' and lecturers' acceptance of an LMS using the UTAUT2 framework. Their results indicated that social influence had significantly and positively affected lecturers' behavioural intention to accept an LMS. In another study on exploring the factors influencing pre-service teachers' behavioural intention to use an LMS in Ghana, Buabeng-Andoh and Baah (2020) reported that social influence had an effect on pre-service teachers' behavioural intention to use an LMS. In Saudi Arabia, Alghamdi (2020) investigated the factors that affect K-6 teachers' behavioural intention to use digital textbooks in their classrooms using the UTAUT as a theoretical underpinning. The results indicated that social influence had a significant positive relationship on K-6 teachers' behavioural intention to use digital textbooks. In another study where the UTAUT was applied to determine the factors affecting primary school teachers' acceptance of distance learning technologies in Lithuania, Jevsikova et al. (2021) found that social influence had significantly affected primary school teachers' behavioural intention to use distance learning technologies.

Another study by Shah et al. (2021) in Pakistan reported that secondary school teachers are socially influenced by their significant others' beliefs about using ICT for teaching, which in turn influences their behavioural intention to use ICT for teaching. In this study, it was asserted that secondary school teachers' behavioural intention to accept and use WhatsApp for ERT was influenced by their colleagues, family and the school's stakeholders' beliefs about WhatsApp for ERT. To investigate this relationship, the following hypothesis was proposed:

**H3:** Social influence influences behavioural intention to accept and use WhatsApp for ERT.

#### 2.3.4 Facilitating conditions

The construct of facilitating conditions was introduced by Venkatesh et al. (2003) in the UTAUT to describe the extent to which individuals believe that the organisational and technological infrastructures necessary to use the intended technology are available. According to Venkatesh et al. (2012), facilitating conditions are similar to other factors that may have an impact on an individual's acceptance and use of technology, such as compatibility and perceived behavioural control. For this study, 'facilitating conditions' refers to the degree to which secondary school teachers believed that organisational resources and technical support existed to support the use of WhatsApp for ERT. In this study, facilitating conditions had four indicators: resources, knowledge, support and compatibility.

The resources indicator describes the availability of the resources necessary to use WhatsApp for ERT. Knowledge refers to the presence of the technical knowledge required to use WhatsApp for ERT. Support is the existence of technical support to support the use of WhatsApp for ERT. Compatibility is the degree of suitability of WhatsApp with other digital technologies used for ERT. Therefore, facilitating conditions such as the availability of resources, for example smartphones and internet access, the existence of technical assistance, the presence of technical knowledge and the compatibility of WhatsApp with other digital learning technologies may play an important role in influencing secondary school teachers to accept and use WhatsApp for ERT. In contrast, a lack of such facilitating conditions may discourage them from accepting and using WhatsApp for ERT. Al-Adwan et al. (2018) affirm that lack of facilitating conditions may have a detrimental influence on technology acceptance and use, because the lack of technical support and resources creates barriers to the use of technology.

Al-Qeisi et al. (2015) observed that during the early phases of technology adoption, facilitating conditions significantly influence behavioural intention, but the influence diminishes with experience. Lai (2017) contends that users with experience in using a technology would be less reliant on technical support. Previous studies have reported that there is a significant relationship between facilitating conditions and behavioural intention to use WhatsApp for learning (Balasundran et al., 2021; Indrawati & Ariyanti, 2015; Maphosa et al., 2020). Ambarwati et al. (2020) examined the influence of facilitating conditions and user habits on users' behavioural intentions to use an online learning platform in Indonesia. Data were collected quantitatively through a



questionnaire from 254 respondents who were actively using the online learning platform. The results showed that both facilitating conditions and user habits significantly influenced behavioural intention to use the online learning platform. The study concluded that the significant influence of facilitating conditions on behavioural intention is mostly related to the availability of the resources needed to use the online learning platform.

In a study on exploring the influence of UTAUT2 determinants on college students' and lecturers' behavioural intentions to use social media in education in China, Huang (2018) reported that facilitating conditions influenced students and lecturers' behavioural intentions to use social media in education. In the context of this study, it was believed that secondary school teachers' behavioural intention to accept and use WhatsApp for ERT was influenced by their facilitating conditions. Therefore, the following hypothesis was proposed:

**H4:** Facilitating conditions influence behavioural intention to accept and use WhatsApp for ERT.

#### 2.3.5 Hedonic motivation

Hedonic motivation describes the enjoyment or pleasure that users experience when using technology (Venkatesh et al., 2012). It is also conceptualised as perceived enjoyment, perceived playfulness and hedonic expectancy in technology acceptance research and has been reported to have a direct impact on technology acceptance (Tamilmani et al., 2019). Hedonic motivation was used in this study to refer to the fun, enjoyment or entertainment experienced by secondary school teachers when using WhatsApp for ERT. The indicators used to measure hedonic motivation were perceived enjoyment, perceived excitement and perceived fun.

Perceived fun refers to the degree of pleasure that secondary school teachers gain from using WhatsApp for ERT. Perceived enjoyment refers to the amount of pleasure secondary school teachers gain when using WhatsApp for ERT, and perceived entertainment describes the extent to which the use of WhatsApp for ERT could be entertaining to secondary school teachers. Therefore, based on the aforementioned elements of hedonic motivation, secondary school teachers are likely to accept and use WhatsApp for ERT when they enjoy and have fun (e.g. using funny emoticons, emojis or stickers) while using it. In addition, teachers who derive fun and pleasure

while using WhatsApp for ERT are more likely to perceive WhatsApp as more productive than their counterparts. A number of studies reported that hedonic motivation is a significant predictor of behavioural intention (Marpaung et al., 2021; Moorthy et al., 2019; Oluwajana et al., 2019; Tamilmani et al., 2019). In their study investigating the factors influencing primary and secondary school teachers' behavioural intentions to use mobile internet in the educational process in Greece, Nikolopoulou et al. (2021) found that hedonic motivation significantly predicts teachers' intentions and actual use of mobile internet.

In a different study on identifying the factors influencing preservice teachers' behavioural intention to use immersive virtual reality in Australia, Bower et al. (2020) reported that hedonic motivation had a significant influence on preservice teachers' behavioural intention to use immersive virtual reality. In another study investigating the factors that influence preservice teachers' acceptance of the use of mobile devices for learning in Greece, Zacharis (2020) reported that hedonic motivation significantly affected preservice teachers' behavioural intention to use mobile devices for learning. In Iraq, Zwaina and Haboobib (2019) found hedonic motivation to affect students' and lecturers' behavioural intentions to use an LMS. In this study, it was believed that secondary school teachers derived enjoyment from using WhatsApp for ERT, which influenced their behavioural intention to accept and use WhatsApp for ERT. Therefore, the following hypothesis was formulated:

**H5:** Hedonic motivation influences behavioural intention to accept and use WhatsApp for ERT.

#### 2.3.6 Teaching value

In this study, the teaching value construct replaced the price value construct of the UTAUT2, as teachers do not pay or purchase WhatsApp to use it for ERT. WhatsApp is a free messenger application that lets users send or receive text and multimedia messages and make voice or video calls (Jackson, J., 2020; Verma et al., 2020). Venkatesh et al. (2012) added the price value construct to extend the UTAUT to consumer settings to represent "consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them" (p. 9). The price value construct is a significant element where consumers bear the cost of purchasing the technology (Gunasinghe et al., 2020). However, in this study, it was excluded due

to its low relevance, as no direct costs are imposed on teachers by the WhatsApp developers for using WhatsApp for ERT. In addition, although WhatsApp relies on internet connectivity to send and receive messages, there are no direct costs imposed on teachers by the WhatsApp developers, as WhatsApp is free to use.

In contexts where price is pertinent, it influences the perception of value (Shaw & Sergueeva, 2019). For instance, when buying a technological device, the benefits or quality is “weighed against the price to be paid” (Shaw & Sergueeva, 2019, p. 47). Chang and Tseng (2013) assert that price value evolved from perceived value and is frequently seen as a key factor in predicting an individual’s buying behaviour. Therefore, as in other educational studies that employed the UTAUT2 (Dajani & Hegleh, 2019; Zwain, 2019), the price value construct was less relevant in the context of this study. Ain et al. (2015) replaced the price value construct with the construct of learning value to investigate the influence of learning value on LMSs. They acknowledge Venkatesh et al.’s (2012) definition of price value and describe learning value as the “cognitive trade-off between the perceived value of LMS, and time and effort spent for using it” (Ain et al., 2015, p. 6). In this study, teaching value was conceptualised as the cognitive trade-off between the perceived value of WhatsApp and the time and effort spent using it. The values of worthiness, flexibility, quickness and accomplishment of teaching objectives were the indicators of teaching value.

Replacing price value with teaching value is justifiable for this study since secondary school teachers do not purchase WhatsApp to use it for ERT, as it is a free messaging application. In addition, since WhatsApp relies on an internet connection to send and receive messages, the Limpopo Department of Basic Education partnered with Statistics South Africa and Telkom to provide all quintile 1 to 3 teachers and grade 12 learners with tablets and monthly data bundles (Independent Online, 2022). Therefore, all secondary school teachers in the Namakgale Circuit received tablets with monthly internet bundles. Prasetyo et al. (2021) also replaced price value with a learning value construct to determine the factors influencing students’ acceptance of online learning platforms during the Covid-19 pandemic. The results revealed that learning value had a positive effect on students’ behavioural intention to accept online learning platforms. Therefore, the following hypothesis was proposed for this study to understand the relationship between teaching value and behavioural intention to accept and use WhatsApp for ERT:

**H6:** Teaching value influences behavioural intention to accept and use WhatsApp for ERT.

### 2.3.7 Habit

Tamilmani et al. (2018) posit that habit is the most significant construct introduced to the UTAUT2 as a primary predictor of the actual use of technology, which challenged the role of behavioural intention as the sole predictor of technology use. It is described as the degree to which an individual performs a behaviour automatically as a result of learning (Ramírez-Correa et al., 2019). Within the context of the present study, habit refers to the degree to which secondary school teachers tended to use WhatsApp for ERT automatically. It was measured using four indicators. The first indicator is habit, which is the extent to which using WhatsApp for ERT is a habitual behaviour for secondary school teachers. The second indicator is addictiveness, which is the degree to which secondary school teachers become addicted to using WhatsApp for ERT. The third indicator is 'necessity', which is concerned with the feeling of necessity from secondary school teachers to use WhatsApp for ERT. The fourth indicator is motivation to learn, which describes the degree to which using WhatsApp for ERT motivates secondary school teachers to learn more about the use of WhatsApp for ERT.

Habit can predict an individual's future behaviour, and individuals are likely to have a positive behavioural intention to execute behaviours that they have frequently executed in the past. Venkatesh et al. (2012) point out that as users gain more experience in using technology, they begin to use it habitually. Therefore, once teachers begin using WhatsApp for ERT on a regular basis, the behaviour becomes a routine and habit, influencing them to continue using WhatsApp for ERT. It is worthwhile to note that while most scholars concluded that repetition frequency is the most important factor in determining habit, other scholars disagree, claiming that habit is a non-reflective behaviour in which individuals respond to circumstances (Huang, 2017). Therefore, the emphasis should be on how an individual automatically executes a behaviour, rather than on how many times the behaviour is performed.

In the UTAUT2, habit has a direct influence on actual technology use as well as an indirect influence via behavioural intention. Previous studies have found that habit had positively influenced behavioural intention (Martins et al., 2018; Raman & Thannimalai,

2021; Yu et al., 2021). For example, a study by Widjaja et al. (2019) in Indonesia found that habit had a significant influence on lecturers' behavioural intention to accept an LMS. Xian (2019) investigated the factors influencing university lecturers to accept online learning in China and reported that habit had significantly influenced university lecturers' behavioural intention to use online learning. Another study conducted by Nikolopoulou et al. (2021) in Greece reported that habit had significantly predicted teachers' behavioural intentions to use mobile internet. In Vietnam, Nguyen and Nguyen (2021) found that university lecturers' behavioural intention to use video conferencing for teaching was significantly influenced by habit. In this study, it was believed that the repeated use of WhatsApp for ERT by teachers over a long period encourages them to have a positive behavioural intention towards WhatsApp for ERT. Therefore, the following relationship was hypothesised:

**H7:** Habit influences behavioural intention to accept and use WhatsApp for ERT.

#### 2.3.8 Attitude towards use

According to Brittler and Abbas (2020), people's attitude towards the use of technology play a vital role in technology acceptance as a powerful factor for a positive change. Davis et al. (1989) describe attitude towards use as the positive or negative feelings of individuals toward using a particular technology. Venkatesh et al. (2003) define it as "an individual's overall affective reaction to using a system" (p. 455). In this study, it refers to secondary school teachers' positive or negative feelings about using WhatsApp for ERT. Perceived value, great idea, making work interesting were the indicators of attitude towards use in this study. It is proposed in this study that secondary school teachers' attitude towards using WhatsApp for ERT would influence their acceptance and use of it for ERT. Teachers with positive attitudes towards using WhatsApp for ERT are more likely to accept and continue using WhatsApp for ERT than their counterparts. Therefore, the attitudes of secondary school teachers towards using WhatsApp for ERT are worth investigating, as such attitudes are critical to the successful implementation of ERT using WhatsApp. Davis (1989) contends that users' attitude towards technology acceptance is critical for the successful adoption and implementation of technology. Furthermore, Al-Busaidi and Al-Shihi (2010) opine that individuals' attitude towards the use of technology should be taken into account when investigating the factors influencing the acceptance of such technology.

Venkatesh et al. (2003) excluded attitudes in the original UTAUT theory, arguing that they do not have a direct impact on behavioural intention because of their interaction effects with both effort expectancy and performance expectancy. Attitude towards use is a significant determinant of behavioural intention in technology acceptance theories and models such as the TAM (Davis et al., 1989), the TRA (Fishbein & Ajzen, 1975), the MM (Davis et al., 1992) and the TPB (Taylor & Todd, 1995). Previous studies have highlighted the significance of attitude towards use in influencing behavioural intention (Buabeng-Andoh, 2018; Dwivedi et al., 2019; Weng et al., 2018). These studies have emphasised the significance of knowing how personal attitudes influence behavioural intentions towards technology use. Kampookaew (2020) used the TAM framework to explore the factors influencing EFL university lecturers' acceptance of technology in Thailand. Data were collected qualitatively using in-depth interviews from eight EFL university lecturers. The findings showed that only attitude towards use had a significant influence on EFL university lecturers' behavioural intention to accept technology.

In another study where the TAM was used as theoretical underpinning, Lavidas et al. (2022) investigated the factors that had an impact on university lecturers' acceptance of an LMS in Greece and reported that university lecturers' attitude towards the LMS influenced their behavioural intention to use it. In this study, it was believed that secondary school teachers' attitude towards using WhatsApp for ERT will influence their behavioural intention to accept and use WhatsApp for ERT. Therefore, the following hypothesis was proposed:

**H8:** Attitude towards use influences behavioural intention to accept and use WhatsApp for ERT.

### 2.3.9 Personal innovativeness

Agarwal and Prasad (1998) propose the construct of personal innovativeness to the field of technology acceptance to describe an individual's willingness to try out any technology. Patil et al. (2020) state that even though the construct of personal innovativeness was not introduced by any model or theory of technology acceptance, it has gained recognition as a critical predictor of innovation adoption across different fields. Patil et al. (2020) further argue that because the UTAUT2 failed to acknowledge the impact of individual variations during the adoption process, the inclusion of

personal innovativeness would be considered a significant extension to the UTAUT2. Lu (2014) maintains that personal innovativeness is effective in predicting the adoption of innovation, because it captures people's natural inclination to try new technology in different fields of technology acceptance. Therefore, this study included personal innovativeness to UTAUT2 to describe the willingness of secondary school teachers to try out new digital platforms for ERT. Openness, enthusiasm and reluctance to accept and use WhatsApp for ERT were the indicators of personal innovativeness in this study.

Agarwal and Prasad (1998) state that personal innovativeness is an expression of an individual's risk-taking proclivity that occurs in some people but not in others. According to them, people with higher personal innovativeness are more likely to embrace an innovation sooner (Agarwal & Prasad, 1998). Most studies found personal innovativeness to influence behavioural intention significantly (Hossain et al., 2019; Suo et al., 2022; Wu & Lai, 2021). In a study on examining the antecedents that influence primary school teachers' behavioural intention to use smart technologies for enhancing learners' thinking skills in Thailand, Khlaisang et al. (2021) reported that personal innovativeness had a positive impact on primary school teachers' behavioural intention to use smart technologies for enhancing learners' thinking skills. In another study, Kim and Park (2018) probed factors influencing university lecturers' and students' behavioural intention to use e-learning in Indonesia. Data were collected quantitatively using a paper-based questionnaire from 390 students and 370 lecturers from five Indonesian universities. The results demonstrated that personal innovativeness had a more significant influence on university lecturers' intentions to use e-learning.

Another study conducted in Malaysia by Noh et al. (2014) found that personal innovativeness had a significant effect on primary and secondary school teachers' intentions to use Educational Web television. Although personal innovativeness has been used in recent research to explain people's adoption of technology, Pinho et al. (2020) argue that the personality traits that underpin such behaviour have been overlooked. In this study, it was believed that personal innovativeness measures secondary school teachers' willingness to accept and use WhatsApp for ERT and subsequently influences their behavioural intention to accept and use WhatsApp for ERT. Therefore, the following hypothesis was proposed:

**H9:** Personal innovativeness influences behavioural intention to accept and use WhatsApp for ERT.

#### 2.3.10 Self-efficacy

Bandura (1986) first introduced the concept of self-efficacy in SCT to describe confidence in one's own skills to carry out an action or activity required to accomplish a goal or job. It reflects individuals' belief in their own capacity to accomplish the goals that they set for themselves. It is worth noting that self-efficacy does not measure individuals' skills, but reflects what individuals feel they could do based on their skills or abilities (John, 2013). Compeau and Higgins (1995) later adapted the concept and used it in the field of technology acceptance and termed it 'computer self-efficacy'. According to them, computer self-efficacy refers to individuals' belief in their ability to accomplish computer-related tasks effectively. In the context of the current study, it refers to secondary school teachers' confidence in their ability to use WhatsApp for ERT. The familiarity of WhatsApp and self-confidence in using WhatsApp for ERT were the indicators of self-efficacy in this study. Teachers' confidence relates to both their anticipated possibility of success in using WhatsApp for ERT and the extent to which they believe that the success is under their control. Therefore, teachers who are more confident in their skills and abilities will put more effort into using WhatsApp for ERT and will persevere longer to overcome any challenges than those who are less confident in their abilities. Compeau and Higgins (1995) argue that self-efficacy is an essential individual characteristic that moderates organisational impacts on an individual's decision to use technology, such as encouragement and support.

Venkatesh et al. (2003) removed the construct of self-efficacy from the original UTAUT due to its insignificant influence on behavioural intention. However, several empirical studies have demonstrated that self-efficacy has a positive significant influence on behavioural intention (Deliana et al., 2019; Garaika et al., 2019; Liu et al., 2019). Bakheet and Gravell (2020) probed the factors that have an impact on computer science lecturers' intentions to adopt flipped classrooms in the UK and found that self-efficacy had significantly influenced lecturers' behavioural intentions to adopt flipped classrooms. In another study, Balkaya and Akkucuk (2021) investigated the factors that have an impact on primary and secondary school teachers' behavioural intention to adopt LMSs in Turkey. Their research model was based on the UTAUT with self-



efficacy as an external variable. Data were collected through a survey from 452 primary and secondary school teachers. The results showed that self-efficacy had a significant effect on primary and secondary school teachers' behavioural intention to adopt LMSs.

Another study by Thach and Lai (2021) explored the factors affecting university lecturers' intentions to use LMSs in Vietnam and reported that self-efficacy had a significant direct influence on lecturers' intentions to use LMSs. Based on the results of the aforementioned studies, this study hypothesised that teachers' self-efficacy in using WhatsApp for ERT influenced their behavioural intention to accept and use WhatsApp for ERT. Therefore, the following hypothesis was proposed:

**H10:** Self-efficacy influences behavioural intention to accept and use WhatsApp for ERT.

#### 2.3.11 Behavioural intention

Behavioural intention has been recognised as a direct predictor of individuals' behaviour in most theories and models of technology acceptance based on psychological theories (Gupta & Dogra, 2017). Warshaw and Davis (1985) define behavioural intention as "the degree to which a person has formulated conscious plans to perform or not perform some specified future behaviour" (p. 215). In this study, behavioural intention refers to a teacher's likelihood to use WhatsApp for ERT in the future or not. The indicators used to measure behavioural intention were subjective probability and recommendations to others. According to Zalessky and Hasan (2018), a person's behavioural intention can be influenced by a number of factors. Venkatesh et al. (2012) postulate that behavioural intention is the strongest predictor of use behaviour, which is the actual use of technology.

However, in this study, the variable of use behaviour was excluded in the proposed extension of the UTAUT2 because of the following three reasons. Firstly, the present study investigated the factors influencing behavioural intention to accept and use WhatsApp for ERT. Secondly, the variable of use behaviour has a questionable association with behavioural intention during the Covid-19 pandemic (Tandon, 2020; Udang, 2022). Finally, the variable of use behaviour is less important in the early stages of the implementation of technology (Weinhard et al., 2017). The implementation of ERT using WhatsApp is still in its initial stages in secondary schools.

Other studies applying the UTAUT2 to study the factors that influence teachers' intentions to accept and use various technologies for teaching have also excluded the variable of use behaviour (Ismail et al., 2022; Mohd et al., 2019)

## **2.4 SUMMARY**

This chapter discussed the review of the literature on popular models and theories used for explaining and understanding the acceptance and use of various technologies, in particular the TRA, TAM, C-TAM-TPB, MPCU, MM, IDT, SCT, TPB, UTAUT and UTAUT2. Among these models and theories, the UTAUT2 is the most robust and widely used theory for studying technology acceptance in different contexts. The present study applied the UTAUT2 as a theoretical framework to understand the phenomenon under investigation. Furthermore, the justifications for selecting the UTAUT2 as a theoretical framework and its applicability to the current study were discussed. In addition, a review of literature related to the UTAUT2 was presented. Finally, the chapter presented the proposed extension of the UTAUT2 and the study's hypotheses. The next chapter presents an extensive review of the existing literature and studies related to the research problem.

## **CHAPTER 3**

### **LITERATURE REVIEW**

#### **3.1 INTRODUCTION**

In the preceding chapter, the theoretical framework of this study was discussed. This chapter provides an extensive review of relevant literature related to the problem under study. A literature review critically synthesises, evaluates and analyses theories and research findings of researchers and scholars that relate to a topic of study (Efron & Ravid, 2019). The main purposes of a literature review are to provide the background for the study and to inform the research design and methodology (Maggio et al., 2016; Ravitch & Riggan, 2017). A literature review is also necessary because it assists researchers in articulating clear goals, displaying sufficient preparation, presenting relevant findings and participating in reflective criticism (Maggio et al., 2016). Nwanzu and Mbanefo (2017) emphasise that a literature review demands a detailed and extensive search of all published literature to present an accurate, critical and comprehensive understanding of the existing body of knowledge relevant to the research problem.

Moreover, Bruce (1994) holds the view that a literature review chapter is necessary for every thesis, as it gives context and a rationale for the research conducted. Nwanzu and Mbanefo (2017) contend that the literature review chapter is critical, as it contributes to every other chapter of a thesis. Therefore, this chapter discusses the existing literature related to the acceptance and use of WhatsApp for ERT. This chapter has six major divisions. The first section lays the foundation by providing a brief background of ERT and how it differs from online learning. The second section explores the initiatives established by both developed and developing countries to support ERT implementation at schools. The third section discusses the challenges faced by teachers during their transition to ERT. The fourth section explores the benefits of ERT for teachers. The fifth section provides an overview of WhatsApp. The section also discusses the educational affordances of WhatsApp. Finally, the last section discusses the use of WhatsApp as a platform for ERT and the associated benefits and disadvantages.

#### **3.2 BACKGROUND OF EMERGENCY REMOTE TEACHING**

The Covid-19 pandemic disrupted traditional schooling in all countries throughout the globe, with nationwide school closures to maintain physical distancing. The decision to close schools was viewed as a critical step in decreasing the spread of the virus. Consequently, ministries of education in all countries encouraged all levels of education to implement online learning to maintain the continuity of teaching and learning during the school closures (Ferri et al., 2020). UNESCO (2020) also encouraged all school levels to adopt online learning, stating that it could help prevent the transmission of Covid-19 by maintaining physical distancing. The adoption of online learning during school closures as a result of a pandemic is not new.

Many countries have long implemented online learning during the closure of schools due to a pandemic crisis. For example, during the school closures in the USA, the UK, Serbia, Japan, Italy, France, China and Bulgaria due to the outbreak of swine flu (H1N1 flu) in 2009, which afflicted many people worldwide, online learning was implemented to allow the continuity of learning (Cauchemez et al., 2014). In addition, apart from during a pandemic, online learning has long been implemented in violent, conflicted and war-torn countries (Hodges, Moore, Lockee, Trust & Bond, 2020). For instance, online learning was adopted in Palestine to allow continuous learning for learners during mobility restrictions due to the Palestinian–Israeli conflict (Shraim & Khlaif, 2010). Syria also implemented online learning during civil war (Tauson & Stannard, 2018). Online learning was also implemented in South African universities between 2015 and 2017 in response to the #FeesMustFall student demonstrations and campus shutdowns (Czerniewicz et al., 2019).

Furthermore, online learning was not only introduced in times of a pandemic, war or conflict, but has long been suggested as a viable alternative for face-to-face education due to the emergence of the internet and networking technologies to enable students to learn from anywhere and at any time (Shim & Lee, 2020). Moreover, although the transition to online learning during the Covid-19 pandemic might have helped to mitigate the spread of the virus, the rate at which this transition was anticipated was unprecedented and astonishing (Hodges, Moore, Lockee, Trust & Bond, 2020). Bozkurt and Sharma (2020) explain that online learning is a complicated process that involves meticulous planning, instructional design and identification of goals to create effective learning environments. Nhongo and Tshotsho (2021) state that the unexpected shutdown of schools due to Covid-19 pandemic required immediate

solutions. Mohammed et al. (2020) observed that providing quick and temporary access to education throughout the pandemic would be more efficient than reconstructing a complex educational environment. Hodges, Moore, Lockee, Trust and Bond (2020) suggested the implementation of ERT at all school levels to maintain the continuity of teaching and learning during school closures, as ERT can be implemented immediately and requires the use of readily available resources. Hodges, Lockee, Trust and Bond (2020) coined the concept of ERT during the Covid-19 pandemic to describe a “temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances” (para. 13).

According to Hodges, Moore, Lockee, Trust and Bond (2020), ERT entails the use of entirely remote teaching solutions for education that would normally be offered face to face, with the goal of returning to that mode when the crisis is over. Hodges, Moore, Lockee, Trust and Bond (2020) have been credited for their comprehensive description of ERT. Accordingly, all other scholars and researchers discussing ERT formulate their arguments based on their study (Nhongo & Tshotsho, 2021). Furthermore, Hodges, Moore, Lockee, Trust and Bond (2020) acknowledge that due to a lack of time for designing and developing teaching and learning materials, ERT may degrade the quality of education offered and therefore emphasise that ERT must be understood as a short-term solution to an urgent crisis, rather than a long-term solution. They further argue that when ERT is understood in this way, distinctions should be made between ERT and online learning (Hodges, Moore, Lockee, Trust & Bond, 2020). Therefore, it is critical to understand the distinctions between ERT and online learning, as misunderstandings in terms of terminology could lead to misunderstandings in practice (Bozkurt et al., 2020; Chirinda et al., 2021). To have a better understanding of the distinctions between ERT and online learning, it is necessary to briefly revisit the concept of online learning.

Online learning can be described as learning that is facilitated through the internet (Yuliansyah & Ayu, 2021). Online learning has been around for decades, and is developed on the foundation of rigorous planning and instructional design (Bozkurt & Sharma, 2020; Hodges, Moore, Lockee, Trust & Bond, 2020). Online learning should be carefully planned and developed to be available online from the start (Ho et al., 2021). Accordingly, designing and developing an online learning experience typically require adequate time and resources. According to Bawa (2020), online learning aims

to provide relevant learning opportunities to students who would otherwise be unable to attend traditional classrooms due to professional or personal obligations. The literature highlights several benefits of online learning, including learning from anywhere and at any time (Yuliansyah & Ayu, 2021), learning at one's own pace (Panigrahi et al., 2018) and eliminating travel time and money (Dhawan, 2020).

Based on the above discussion of online learning, it can be noted that in contrast to ERT, which represents a short-term shift of traditional classroom instruction to alternative environments, online learning is deliberately planned from the start to be online (Hodges, Moore, Lockee, Trust & Bond, 2020). In addition, in comparison to ERT, which aims to give short-term access to education that is easy to set up, online learning aims to develop a robust learning environment (Hodges, Moore, Lockee, Trust & Bond, 2020). Toquero (2020) makes a distinction between ERT and online learning and argues that unlike ERT, which is unplanned and requires instant implementation, online learning requires careful planning and design before it is implemented. Therefore, it is worth pointing out that online learning and ERT are not synonymous and cannot be used interchangeably.

The advancements in digital technology have made ERT easier to achieve. Several digital platforms have been used to implement ERT, such as LMSs (e.g. Google Classroom, Blackboard, Edmodo, Canvas and Moodle), video conferencing tools (e.g. Webex, Google Meet, Microsoft Teams and Zoom), social media applications (e.g. Instagram, Twitter and Facebook) and mobile messaging application (e.g. WhatsApp) (Amin & Sundari, 2020; Bozkurt et al., 2020). These platforms allow ERT to be provided in both synchronous and asynchronous learning environments. In a synchronous learning environment, teaching and learning happen live in a virtual classroom through chatting tools and video conferencing applications with real-time feedback (Basri et al., 2021). Conversely, in an asynchronous learning environment, there are no live interactions between teachers and learners, and learners cannot receive instant feedback (Basri et al., 2021). Amin and Sundari (2020) observed that each platform is associated with its own benefits and drawbacks when it is being used to implement ERT. As a result, some teachers opt to employ more than one platform in tandem to meet their learners' learning needs. However, WhatsApp is the most widely used platform to implement ERT, especially in countries where ICT infrastructure is only partially available (Bozkurt et al., 2020).

Moreover, the successful implementation of ERT lies in teachers' hands, because they are learning catalysts (LaBonte, 2020). Therefore, it is necessary for teachers to have implementation plans that will guide them when implementing ERT (Talidong, 2020). Hodges, Moore, Lockee and Bond (2020) proposed a model for implementing ERT in which they identified three critical areas that teachers should consider while adopting ERT, namely pre-implementation evaluation, contextual assessment and assessment evaluation. To them, pre-implementation evaluation entails teachers considering how they are going to cater for learners who might experience difficulties in accessing the ERT platform (Hodges, Moore, Lockee & Bond, 2020). Contextual assessment entails teachers considering the issues of the availability and accessibility of ICT tools for implementing ERT (Hodges, Moore, Lockee & Bond, 2020), while assessment evaluation involves teachers assessing whether the assessment produced adequate data to steer the design and development of ERT (Hodges, Moore, Lockee & Bond, 2020).

### **3.3. EMERGENCY REMOTE TEACHING INITIATIVES BY DEVELOPED AND DEVELOPING COUNTRIES**

Due to schools shutting down in reaction to the Covid-19 pandemic, schools in both developed and developing nations were required by their respective governments to immediately shift to ERT to maintain the continuation of teaching and learning (Ferri et al., 2020). Correspondingly, ministries of education in both developed and developing countries launched various initiatives to support schools with the transition to ERT. This section discusses the ERT initiatives launched by developed and developing countries. It begins by discussing the initiatives developed by developing countries and thereafter discusses the ERT initiatives by developed countries. The section ends with a more robust discussion of the initiatives established by the selected developing and developed countries to support ERT implementation in schools.

#### **3.3.1 Emergency remote teaching initiatives by developing countries.**

This sub-section discusses the initiatives launched by the developing countries Rwanda, Zimbabwe, South Africa, China, Argentina and India to support ERT implementation in schools.

##### **3.3.1.1 Rwanda**

The first case of the Covid-19 pandemic in Rwanda was reported on 14 March 2020 (Wanyana et al., 2021). In response to the pandemic, the Rwandan government shut down all schools on 16 March 2020 and implemented a nationwide lockdown on 21 March 2020 (Ngamiye, 2020), making Rwanda the first country in Africa to close schools and declare a nationwide lockdown during the pandemic (Rwigema, 2021). The sudden closure of schools by the Rwandan government affected more than 3 million learners in both primary and secondary schools (Pellini et al., 2021). Together with the Rwanda Education Board (REB), the Rwandan government engaged in numerous ERT initiatives to maintain learning continuity during school closures (Arshad, 2020). The REB, in partnership with Rwanda's development partners in education, launched television lessons, with lessons starting from where learning had been halted in the classroom (Mugiraneza, 2021). However, this initiative could not reach a larger audience of learners, as out of the Rwandan population of 13.36 million, only 11.6% own a television set, which translates into 1.51 million of Rwandan people owning a television set (Mugiraneza, 2021).

As an immediate solution, the REB collaborated with the Rwanda Broadcasting Agency to launch educational radio programmes for primary learners broadcast on Radio Rwanda and district-level radio stations such as Rusizi, Nyagatare, Rubavu, Musanze and Huye (Arshad, 2020). Radio is Rwanda's most popular and accessible mass medium, reaching 98% of the country's population (Hansen et al., 2021). Due to this wide reach, the Rwandan Ministry of Education determined that radio lessons are the best immediate solution for ensuring the continuity of learning during school closures in Rwanda (Houser, 2020). The United Nations Children's Fund (UNICEF) supported Rwanda's educational radio lessons initiative by leveraging its network to obtain 144 radio scripts on numeracy and literacy lessons from other nations (Houser, 2020). These numeracy and literacy radio lessons were aligned with the Rwandan curriculum (Houser, 2020). However, Mugiraneza (2021) argues that the REB's television and radio educational programmes primarily targeted Rwandan public-school learners, because most private school learners obtained educational content through WhatsApp.

The REB expanded its measures to support ERT initiatives by launching an REB e-learning YouTube channel to allow learners to continue learning from home until schools reopen (The World Bank, 2020). Both primary and secondary school learners



could access Biology, Mathematics, Chemistry and English lessons through the YouTube channel. Furthermore, the REB also implemented ERT on an e-learning portal hosted on its website (Houser, 2020; The World Bank, 2020). The REB e-learning platform allowed teachers to create virtual classrooms, lessons and formative assessments, and to enrol learners (Zgovu, 2021). It also provided learners with digital educational resources and teachers with professional development tools, and allowed communication between teachers, parents and learners (The World Bank, 2020). To ensure that the e-learning platform was accessible to learners who could not afford data costs, the REB partnered with Airtel Rwanda and MTN Rwanda to provide free access to the platform (Houser, 2020). However, despite the zero-rated REB e-learning platform, the platform was not used by many teachers in rural communities due to poor internet connectivity (Mugiraneza, 2021). Furthermore, the REB joined hands with other Rwandan educational development partners to establish an Unstructured Supplementary Service Data (USSD) code that allowed learners to self-assess their learning using mobile phones (Mugiraneza, 2021). The USSD code allowed learners to assess their level of understanding in various subjects by completing a quiz.

### *3.3.1.2 Zimbabwe*

The Zimbabwean Ministry of Primary and Secondary Education (MoPSE) prematurely closed all schools on 24 March 2020 to tackle the Covid-19 outbreak, affecting around 1.3 million teachers and over 4.6 million learners in primary and secondary schools (UNESCO, 2021). The sudden school closures compelled MoPSE to propose several ERT methods to ensure the continuity of education. MoPSE proposed three ERT modes, namely radio, online learning platforms and WhatsApp, to deliver lessons (Nhongo & Siziba, 2022). However, among these modes, only radio and two online learning platforms, namely Ruzivo and Akello Digital Classroom, were considered official modes of implementing ERT in Zimbabwean schools by MoPSE (Nhongo & Siziba, 2022). Ruzivo is a digital learning platform established in 2019 by Higher Life Foundation, targeted at Zimbabwean primary and secondary school learners (Dzinotyiweyi & Taddese, 2020). It included curriculum content in various disciplines, including performing arts, languages, science and commerce, aligned to the Zimbabwean curriculum that has been approved by MoPSE (Dzinotyiweyi & Taddese, 2020). Furthermore, the platform was interactive, intending to increase learner

motivation, engagement and independence in their learning, resulting in improved academic achievement.

Akello Digital Classroom was another online learning platform used by MoPSE to maintain the continuity of education during school closures. The platform was launched by Cassava Smartech on 28 May 2020 to offer Zimbabwean primary and secondary school learners' access to Zimbabwe School Examinations Council (ZIMSEC) curricular lessons for all subjects (Spiked, 2020). It consisted of live online classes and an online platform that distributed on-demand video lessons following the live classes (Spiked, 2020). The live sessions were intended to stimulate interaction with teachers, and the video-on-demand platform was intended for post-live lesson review (Spiked, 2020). Moreover, the Akello Digital Classroom collaborated with a number of publishing companies to establish an online library that allowed learners to access a range of ZIMSEC-recommended textbooks (Dzinotyiweyi & Taddese, 2020). It is worth noting that although the digital classroom was established to ensure the continuity of education during school closures in Zimbabwe, it was implemented as an ERT strategy and as a long-term strategy (Nhongo & Tshotsho, 2021).

Implementing ERT using online learning platforms was the first method proposed by MoPSE at the beginning of school closures. However, Nhongo and Siziba (2022) state that MoPSE recommended using online learning platforms for ERT in Zimbabwe without prior assessment of access to ICT infrastructure by learners and teachers. As a result, MoPSE quickly put the use of Akello and Ruzivo platforms for ERT on hold, considering that most learners in rural areas or from disadvantaged backgrounds did not have access to ICT infrastructure and therefore were excluded from access to education (Nhongo & Tshotsho, 2021). Other challenges that hindered the effective implementation of ERT via online learning platforms in Zimbabwe included a shortage of power supply and poor internet connectivity in rural and remote areas (Dzinotyiweyi & Taddese, 2020). Radio appears to be more accessible to most households in Zimbabwe, even in remote areas, compared to the internet. A recent survey by Techzim (2021) revealed that 62.7% and 50.1% of Zimbabwean households have access to radio and the internet, respectively. Due to the accessibility of radio to most Zimbabwean households, MoPSE recommended that educational lessons be delivered through radio (Nhongo & Siziba, 2022). In addition, MoPSE also

recommended that educational materials be printed and delivered to learners in remote regions without access to the radio (*Sunday News*, 2020).

MoPSE, in partnership with the Zimbabwe Broadcasting Corporation and with financial support from UNICEF, established radio lessons (Hove & Dube, 2021). However, the radio lessons were produced by volunteer teachers and only catered for primary school learners (Dzinotyiweyi & Taddese, 2020). Despite MoPSE's recommendation to have ERT carried out via radio, the strategy fell short of meeting the demand for effective ERT during the school closures. Nhongo and Tshotsho (2021) observed that learners in some remote regions still faced challenges due to the lack of radio signals in their areas. WhatsApp is another platform that MoPSE proposed for schools to use when implementing ERT. Although MoPSE did not treat WhatsApp as a formal platform for ERT in Zimbabwe, teachers widely used it due to its simplicity and accessibility (Nhongo & Siziba, 2022). With over 5.2 million users, WhatsApp is Zimbabwe's most popular social media application (Hove & Dube, 2021).

### 3.3.1.3 South Africa

South Africa confirmed its first case of Covid-19 on 5 March 2020 (Anjorin, 2020). Due to concerns that the virus may infect many people at the anticipated rate, the government declared the Covid-19 pandemic a national state of disaster on 15 March 2020, resulting in a countrywide lockdown starting on 27 March 2020 (Mhlanga & Moloji, 2020). Consequently, the Ministry of Basic Education was forced to close all schools and compelled teachers to implement ERT in order to save the 2020 school year (Chirinda et al., 2021). The Ministry of Basic Education has long been making efforts to intensify online learning in schools before the Covid-19 pandemic (Mhlanga & Moloji, 2020). In 2015, the DBE partnered with the Department of Telecommunications and Postal Services and supplied 4 831 public schools with ICT infrastructure as part of the Universal Service and Access Obligation initiative (*Mail & Guardian*, 2021). However, even though the DBE has long advocated for online learning, the Covid-19 pandemic emphasised the need to speed up its implementation in all schools (Mhlanga & Moloji, 2020). In response to the urgency of implementing online learning during the pandemic, the DBE established various ERT interventions to minimise the impact of the pandemic on education (Mhlanga & Moloji, 2020).

The DBE, in partnership with the Department of Communications and Digital Technologies, worked on ensuring that ERT implementation was a reality during the school closures (DBE, 2020b). Through the partnership between the DBE and the Department of Communications and Digital Technologies, the South African Broadcasting Corporation (SABC), DSTV and E.tv launched channels solely dedicated to education (Mhlanga & Moloji, 2020). On 9 April 2020, the SABC began broadcasting live lessons to learners in the Further Education and Training Phase and in early childhood development through its three television channels and thirteen radio stations (The World Bank, 2020). The live lessons covered various subjects, including Accounting, Life Sciences, English, Geography, Physical Sciences, Mathematics and several African languages in the early childhood development basket (DBE, 2020b). In addition, the SABC launched two studios for broadcasting virtual classrooms (Mhlanga & Moloji, 2020). The virtual classrooms allowed teachers to deliver live and real-time lessons in the same way that they would in a traditional classroom. In addition to the aforementioned initiatives, the DBE also joined forces with community television and radio stations across the country to broadcast curriculum content daily (DBE, 2020b).

The DBE also launched the free Science, Technology, Engineering and Mathematics (STEM) Lockdown Digital School in collaboration with the Sasol Foundation and Africa Teen Geeks (DBE, 2020b). The STEM Lockdown Digital School recruited over 34 teachers from private and public schools to teach grades R to 12 through a live broadcast on the DBE's website, the Ms Zora platform, and Africa Teen Geeks' social media platforms, including Twitter and Facebook (Mhlanga & Moloji, 2020). The lessons were recorded and uploaded on the DBE's website, allowing learners to access them whenever they wanted (Mhlanga & Moloji, 2020). The DBE later expanded the STEM Lockdown Digital School to community television stations to reach a wider audience (DBE, 2020b). Furthermore, the DBE collaborated with four major telecommunication companies, namely Cell-C, Telkom, MTN and Vodacom, to provide zero-rated educational websites and applications to learners who could not afford data costs (DBE, 2020b). For example, the DBE's website, which provides a host of educational materials including study guides, revision booklets, e-textbooks and the "2Enable" app that provides curriculum-aligned content, was zero-rated by the four telecommunication companies (Mhlanga & Moloji, 2020).

Bozkurt et al. (2020) maintain that the response to ERT in South African schools varied depending on the schooling system. The South African schooling system is categorised into public and private schools (Mhlanga & Moloji, 2020). Public schools are run by the government, whereas private schools are run privately. Public schools are also classified into five quintiles, with Quintile 1 being the 'poorest' and generally situated in rural regions, informal settlements or townships with few resources, and Quintile 5 being the 'least poor' and usually well resourced (White et al., 2019). In addition, schools in quintiles 1 to 3 are non-fee paying, while schools in quintiles 4 and 5 are fee-paying (Lumadi, 2020). Bozkurt et al. (2020) assert that the majority of teachers from Quintile 4 and 5 schools and independent schools were able to quickly convert their traditional lessons into a remote format through various LMSs and platforms such as Canvas, Google Classroom and Zoom. However, in Quintile 1 to 3 schools where ICT infrastructure is partly available, teachers used instant messaging applications such as WhatsApp for communication and delivery of educational content (Bozkurt et al., 2020).

It is interesting to note that, despite the initiatives implemented by the DBE to ensure the continuity of learning, some learners, mainly those from disadvantaged communities, could not continue with remote learning owing to the lack of ICT infrastructure and physical space in which to carry out home-based learning (Mukuna & Aloka, 2020). Mhlanga and Moloji (2020) state that schools in quintiles 1, 2 and 3 could not make a quick transition to ERT due to a shortage of teachers and ICT infrastructure. The DBE also acknowledges that despite reduced data costs and the provision of zero-rated educational websites during school closures, some learners in remote rural areas still could not access the educational content due to internet connection difficulties (Mhlanga & Moloji, 2020).

#### *3.3.1.4 China*

China was the first country worldwide to report a case of Covid-19 on 31 December 2019 (Danon et al., 2021; Spalding et al., 2021). The Chinese government responded to the pandemic by implementing a variety of emergency management measures, including lockdown and school closures, on 23 January 2020 (Shi & Brasseur, 2020; Wang et al., 2020). The school closures affected 276 million Chinese learners in primary and secondary schools (Zhang, 2021). The Chinese education system

responded swiftly to UNESCO's call for learning to continue during school closures. China was the first country in the world to implement ERT during the Covid-19 pandemic (Churiyah et al., 2020). Within a month of school closures, the Chinese Ministry of Education developed an emergency policy known as "Suspending Classes Without Stopping Learning" to promote the implementation of ERT across all school levels (Zhang et al., 2020).

The Chinese Ministry of Education implemented the policy in five steps. Zhang et al. (2020) provide a summary of the five steps that the Chinese Ministry of Education followed during the implementation of the policy:

- (1) Top-level integration of national resources and planning: Firstly, the Chinese Ministry of Education took steps to ensure the availability of internet service infrastructure. The Chinese Ministry of Education, in collaboration with other telecommunications companies such as China Satellite Communication, China Unicom, China Telecom and China Mobile, committed to maintaining school networks and public service platforms at various levels. This initiative allowed for the creation of fast and reliable internet for ERT, and provided access to digital academic materials for learners, teachers and parents. Secondly, the Chinese Ministry of Education made educational resources more widely available to the Chinese people. The Chinese Ministry of Education recognised 37 eligible institutions and internet firms to supply ERT services.
- (2) Training of teachers: The Chinese Department of Education Administration at various levels, including schools, collaborated with teacher training companies to train teachers in online teaching. In addition, the Chinese Department of Teacher Education in collaboration with several organisations developed a resource pack for teachers, which included strategies for online teaching and digital technology tools. Schools backed the efforts made by the Chinese government by hiring online teaching technology experts to assist teachers with remote teaching.
- (3) Allowing schools and local governments to conduct online teaching in accordance with local conditions: In China, regional development is uneven, and there are major disparities in access to ICT infrastructure across regions. To guarantee that all learners, even those in distant regions, had access to ICT

resources, the Chinese government worked on disseminating instructional materials through a variety of methods, including employing satellite television in places where the internet was unavailable. In addition, the Chinese government urged digital education platforms to make their content available to all Chinese schools and people at no cost.

(4) Establishing guidelines to ensure a seamless transition back to regular face-to-face schooling after the pandemic: The Ministry of Education urged teachers to use the “National Elite Online Open Courses” as samples and to teach independently while utilising online teaching tools such as massive open online courses (MOOCs). The Ministry of Education also advised several MOOC platforms to create new courses on infectious illnesses and epidemiology with the goal of providing useful information to learners and the public. Furthermore, to preserve learners’ overall health, the government advised teachers to balance work and relaxation, maintain regular exercise and safeguard their vision from excessive screen time.

(5) Developing a plan for restarting schools after the pandemic: The Ministry of Education implemented a plan to reopen schools in a phased way, taking into consideration the age of the school, the school population density, emergency preparation, transportation circumstances and regional pandemic risk levels.

To support the implementation of the policy, the Chinese Ministry of Education swiftly established several platforms, including National Cloud Classroom, Rain-Classroom, People’s Education Press (PEP), Touch and Read, China Education Television channels, the National Public Service Platform for Educational Resources and DingTalk (Huang et al., 2020). National Cloud Classroom is a platform developed by the Chinese government that offers learners and teachers free access to electronic textbooks prepared by the education department (Cheng, 2020). Such electronic textbooks are prepared to be used in a variety of settings and at all school levels (Kalashnyk et al., 2021). Schools are also able to use the platform’s authoring feature to construct a customised curriculum by using the platform’s resources (Huang et al., 2020; Kalashnyk et al., 2021). In addition, the platform allows for interactive tutoring and online teaching (Huang et al., 2020; Kalashnyk et al., 2021). At the same time, the Chinese Ministry of Education partnered with PEP to provide schools with free digital

educational resources through the “PEP Touch and Read” mobile application (Nhongo & Tshotsho, 2021). The Chinese Ministry of Education recommended that China Education Television televise school subjects and educational materials on television channels to accommodate learners studying in areas with weak or no internet connection (Huang et al., 2020).

Rain-Classroom is another digital platform launched by the Chinese Ministry of Education. Rain-Classroom is a smart teaching platform cooperatively created by Tsinghua University and Xuetang Online with the aim of making online teaching more convenient, strengthening teacher–student interactions and enhancing the classroom teaching experience (Huang et al., 2020). Rain-Classroom allows teachers to send pre-class preview courseware to students’ mobile devices, which includes voice audios, exercises and MOOC videos, allowing them to quickly assess learners’ learning issues and provide timely feedback (Huang et al., 2020). The Chinese Ministry of Education also established the National Public Service Platform for Educational Resources to meet the learning needs of learners during the pandemic (Nhongo & Tshotsho, 2021). The platform incorporated 10 topics, namely film and television education, trip learning education, classic reading, life and safety education, family education, mental health education, curriculum learning, moral education, pandemic prevention education and electronic books (Huang et al., 2020).

Another platform launched by the Chinese Ministry of Education supporting the “Suspending Classes Without Stopping Learning” policy was DingTalk. DingTalk is a multi-terminal platform developed by the Alibaba Group for Chinese enterprises for free communication and collaboration (Li et al., 2021). The platform also allows for the exchange of files between PCs and mobile devices (Nhongo & Tshotsho, 2021). DingTalk created a distance education package that includes live interaction, online class reporting and learner health reports (Huang et al., 2020). DingTalk also broadcasts live class and school announcements, and offers free online and live classes to universities and schools across China through mobile devices and PCs, allowing over one million learners and students to learn simultaneously (Huang et al., 2020).

Despite the arrangements made by the Chinese government to assure the continuation of education during the closure of schools, the implementation of ERT



still faced challenges (Li et al., 2021). According to Zhang et al. (2020), the challenges faced by China while implementing ERT included distractions associated with teaching and learning from home, teachers' lack of knowledge of the appropriate teaching method and technique for online education, lack of ICT infrastructure and digital educational resources, and teachers' lack of knowledge of online teaching.

### *3.3.1.5 India*

In India, more than 276 million learners registered in primary and secondary schools were out of school for over 500 days due to abrupt school closures on March 2020 in response to the Covid-19 pandemic (Van Cappelle et al., 2021). However, there was no instant reaction from the Indian government to ensure learning continuity during the school closures because of India's federal nature (Van Cappelle et al., 2021). India is divided into 28 states, and each state developed its own ERT response plans with advice and resources from the national government. On 21 March 2020, the Ministry of Human Resource Development, which is responsible for implementing national policies on Indian schools, shared several online learning platforms that teachers may use to implement ERT, including the Digital Infrastructure for Knowledge Sharing (DIKSHA), e-Pathshala, the National Repository of Open Educational Resources (NROER) and Study Webs of Active Learning for Young-Aspiring Minds (SWAYAM) (Jena, 2020). DIKSHA is an online learning portal developed by the Ministry of Human Resource Development in partnership with the National Council of Educational Research and Training (NCERT) to provide teacher training and educational materials to learners in grades 1 to 12 (Kumar, 2021). The platform included educational content linked to the Indian curriculum, including electronic textbooks, worksheets, video lessons and assessments. In addition, the content was prepared by over 250 teachers and in the three official languages of India, namely Urdu, Hindi and English.

E-Pathshala is another online learning platform developed by the Indian Ministry of Human Resource Development in partnership with NCERT for learners in grades 1 to 12 in the three official languages of India (Jena, 2020). The platform was also available for download on Android, iOS and Windows mobile devices. The platform contained various educational materials such as e-books, flip books, audios and videos for teachers and learners in the three official languages (Kumar, 2021). In addition, the platform allowed users to download these materials for offline use with unlimited

downloads. The platform also had interesting features that allowed users to make digital notes, share resources, as well as highlight, bookmark, zoom and select text on e-books and flip books. The NROER platform offered a variety of educational materials in Hindi and English for teachers and learners, including curriculum-aligned e-books, videos and interactive modules, as well as a variety of STEM-related games for grades 1 to 12 (The World Bank, 2020).

SWAYAM was another online platform established by the Indian Ministry of Human Resource Development to ensure the continuity of learning for learners in grades 9 to 12 and students in higher education institutions (Jena, 2020). Like other online learning platforms such as NCERT, e-Pathshala and DIKSHA, the SWAYAM platform also included education content linked to the Indian curriculum. Interestingly, the Indian Ministry of Human Resource Development discouraged ERT through online learning platforms for pre-primary school learners, keeping in mind their mental and physical health, and instead suggested television and radio lessons (Nugroho et al., 2020). To cater for learners in pre-primary schools and to reach grade 1 to 12 learners without access to the internet and ICT devices, the Indian Ministry of Human Resource Development established SWAYAM Prabha television channels and partnered with radio stations to broadcast educational lessons (Sharma, 2021).

SWAYAM Prabha television channels consist of 32 Direct to Home channels dedicated to telecast educational lessons 24 hours a day, 7 days a week, and was available throughout India (Kumar, 2021). The channels covered a variety of disciplines such as technology, social sciences, performing arts, commerce, agriculture and science in all levels of education (The World Bank, 2020). Reaching learners via television addressed the challenge of lack of access to ICT resources by learners from disadvantaged communities. In Indian households, television has a greater share of ownership. According to *The Hindi Business Line* (2021), in 2020, the number of Indian households who owned a television set was 210 million, which translates to 72.9% of Indian households owning a television set. To further expand the reach of ERT to the most distant parts of India, the Ministry of Human Resource Development utilised the All-India Radio station and 289 community radio stations to air educational lessons (Sharma, 2021).

Apart from the television and radio lessons and the online learning platforms shared by the Indian Ministry of Human Resource Development, other digital tools such as Google Classroom and Zoom and social media applications such as Facebook and WhatsApp were used to ensure learning continuity during the school closures (Samuel, 2021). However, despite massive efforts by the Indian Ministry of Human Resource Development to promote ERT, school closures resulted in serious inequalities in learning possibilities for children in India (UNICEF, 2021). For example, the school closures forced Indian teachers and learners from disadvantaged communities to transition to ERT without the required resources (UNICEF, 2021). Furthermore, internet access remains the most formidable challenge in remote areas of India (Siddesh & Veerabhadrapa, 2020).

### *3.3.1.6 Argentina*

In Argentina, the first case of the Covid-19 pandemic was reported on 3 March 2020 (Romo & Ojeda-Galaviz, 2021). Due to the pandemic, the Argentinean government closed all schools on 16 March 2020 (Coolican et al., 2020), affecting approximately 11.4 million learners from pre-kindergarten to Grade 12 (Statista, 2021b). The Ministry of Education of Argentina responded to the closure of schools by establishing multiple initiatives to ensure the continuity of teaching and learning. At the beginning of school closures, the Argentinian Ministry of Education launched an online educational platform to provide learners, teachers, families and school authorities with curated digital resources (Arshad, 2020). The online portal included electronic booklets for every school level in various subjects, including Citizenship, Physical Education, Sex Education, Natural Sciences, Social Sciences, Mathematics and languages (Education International, 2020). It also had a virtual reality section with a compilation of 360° videos designed to give learners an immersive learning experience (The World Bank, 2020). Furthermore, the platform also provided teachers with guidelines on arranging remote teaching, including what resources to use and how to encourage learning in the new settings brought by the pandemic (Education International, 2020).

To ensure that the implementation of ERT through the online platform did not create inequalities in access to education, the Argentinian Ministry of Education distributed printed booklets to the homes of learners without access to required technological devices or the internet (The World Bank, 2020). In addition, the Argentinian Ministry

of Education partnered with the Chamber of Supermarkets to allow learners to collect free booklets in over 420 supermarkets throughout the country. The Argentinian Ministry of Education also collaborated with *Ente Nacional de Comunicaciones*, Argentina's national communications and media regulator, to provide data-free access to the online portal (Discover Society, 2020). Moreover, to close the digital gap for Argentinian learners' access to technological devices, the Ministry of Education partnered with municipalities to distribute tablets and notebooks to learners from poor communities (Discover Society, 2020). On 1 April 2020, the Argentinian Ministry of Education and the Secretariat for Media and Public Communications established the programme *Seguimos Educando*, which translates to "Continuing to Educate", to create conditions for the continuity of learning across all schools and disseminate educational content to learners (Arshad, 2020).

The *Seguimos Educando* programme, presented by teachers, broadcast educational lessons on several television stations, including national, provincial and community television stations, and a national radio station and its 49 subsidiaries (The World Bank, 2020). Furthermore, the Argentinian Ministry of Education collaborated with *Encyclopaedia Britannica* to improve schools' learning environments for long-term remote learning solutions and to expand learners' access to remote learning materials (Britannica, 2020). *Encyclopaedia Britannica* granted the entire country free access to a digital library that included teacher training materials and learners' learning resources (Britannica, 2020).

### 3.3.2 Emergency remote teaching initiatives by developed countries.

This sub-section provides a discussion of the ERT initiatives launched by the developing countries Spain, Italy, Austria, Portugal and Turkey.

#### 3.3.2.1 Spain

The Spanish government officially proclaimed the Covid-19 pandemic a state of emergency on 14 March 2020, resulting in abrupt school closures to curb the spread of the virus (Cheng & Khan, 2020). Since the Spanish Flu in 1918, Spain has not had a pandemic that forced the government to close all schools, this time affecting approximately 11 million primary and secondary school learners (Onyema et al., 2020). The Spanish Ministry of Education and Vocational Training (MEVT) took various measures to implement ERT in primary and secondary schools to offset the

effect of school closures on teaching and learning in the country. MEVT launched the national Institute of Educational Technologies and Teacher Training (INTEF), Educlan and Procomún platforms to support teachers with the implementation of ERT (Al-Nuaimi et al., 2021). INTEF is a unit of MEVT responsible for integrating ICT and teacher training at primary and secondary school levels in Spain (Al-Nuaimi et al., 2021). The INTEF platform included educational resources, teacher training manuals and digital technologies that supported ERT. Furthermore, MEVT, in collaboration with the Spanish Radio and Television Corporation (RTVE-Radiotelevisión Española), major educational publishers and the INTEF, established the Educlan platform (The World Bank, 2020).

Educlan is an online channel that offered audio-visual educational content to children aged between 3 and 10 years (Beletskaya et al., 2020). It broadcast educational content five hours a day on Spanish national television and online (Duran, 2021). Therefore, learners could access the content online or watch television at times scheduled for their age and grade. In addition to broadcasting educational content, the Educlan platform also contained free downloadable educational apps, games and books organised according to children's ages. Procomún was another platform launched by MEVT to facilitate ERT during school closures. The Procomún platform provided teachers, parents and learners with access to over 100 000 educational resources arranged by subjects and grades (Al-Nuaimi et al., 2021). These educational resources were published under an open Creative Commons license, meaning that users accessed the materials for free. In addition, teachers could also modify and adapt the materials to suit their contexts and needs. Moreover, the resources available on the Procomún platform were also used by Educlan to broadcast on television (Datos, 2020).

MEVT, in addition to the INTEF, Educlan and Procomún platforms, created a "Resources for online learning" website to provide learners, parents and teachers with access to various online educational resources (The World Bank, 2020). In Spain, most teachers and learners have access to ICT resources required for participating in online education (Barlovits et al., 2021). However, access to online education by learners is dependent on their parental income (Barlovits et al., 2021). For example, children from higher-income families have greater internet access and spend more time learning than children from low-income families. To overcome this inequality in

access to online education, MEVT, in partnership with the Orange telecommunication company, made access to the “Resources for online learning” website free (Beletskaya et al., 2020).

### 3.3.2.2 *Italy*

Italy was the first European country to confirm a case of Covid-19 and the first to declare a nationwide lockdown to reduce the spread of the virus (Pellegrini & Maltinti, 2020). The nationwide lockdown forced the Italian Ministry of Education to close all schools from 5 March 2020, affecting around 8.5 learners from primary and secondary schools (Scarpellini et al., 2021). To save the school year by ensuring the continuity of teaching and learning, the Italian Ministry of Education followed the Chinese Ministry of Education’s lead of ‘suspending classes without stopping learning’ by encouraging teachers to implement ERT in all schools (Cheng, 2020). Accordingly, the Italian Ministry of Education launched several initiatives and platforms to support the implementation of ERT. The Italian Ministry of Education, in collaboration with the National Institute for Documentation, Innovation and Educational Research, created a website that contained recommended cloud tools, digital platforms, collaboration tools and a variety of educational resources to assist schools in implementing ERT (The World Bank, 2020). The Italian Ministry of Education recommended three digital platforms that teachers may use to implement ERT: the Google suite for education, Microsoft Office 365 and WeSchool (Beletskaya et al., 2020; Lecce et al., 2021).

The Google suite for education is a collection of free and simple cloud-based tools and services developed by Google that provides a platform for learning, communication and collaboration. The tools and services include Jamboard, Forms, Drive, Sheets, Slides, Docs, Gmail, Classroom, Chat, Meet, Assignments and Calendar. These tools and services allow teachers to create virtual classes, administer assessments, provide feedback and track learners’ progress (Beletskaya et al., 2020). Microsoft Office 365 is another platform recommended by the Italian Ministry of Education, developed by Microsoft, that helps with the implementation of ERT. Microsoft Office 365 is a suite of Microsoft applications such as Word, Excel, PowerPoint, One Note and Outlook, and services such as Teams, Sway, Exchange, One Drive, Share Point, Forms, Stream, Flow, Power Apps, School Data Sync and Yammer. These services and applications offered by Microsoft Office 365 enable teachers to create a cutting-edge learning

experience (Beletskaya et al., 2020). For example, teachers may use Teams to interact with learners quickly, exchange files and websites, build a OneNote Class Notebook, and disseminate and grade assignments.

WeSchool was the third platform recommended by the Italian Ministry of Education. WeSchool is an educational platform that enables teachers to create lessons by integrating all the information they want in just a few clicks: videos, PDFs, photographs and a whole website, all without moving from one page to the next. It also enables them to collaborate with learners, set up virtual classes, administer assessments and provide feedback (Beletskaya et al., 2020). In addition, the platform has a unique feature, the WeSchool Library, which offers learners videos, examinations and activities compiled by teachers and experts (Lecce et al., 2021). In order to ensure that learners without internet data had access to the three recommended platforms, the Italian Ministry for Education partnered with Telecom Italia, a telecommunication company. Telecom Italia launched an 'E-learning Card' system to provide all its prepaid customers with free access to the Google suite for education, Microsoft Office 365 and WeSchool (Digital Watch, 2020).

Furthermore, alongside the three recommended platforms by the Italian Ministry of Education, several other digital platforms were used by individual teachers to implement ERT, such as Moodle, Eliademy, Fidenia, Edmodo and Classmill (Lecce et al., 2021). However, Italy also experienced challenges with the implementation of ERT through digital platforms. The challenges were identical to those encountered by other nations such as Spain, South Africa and Argentina, such as lack of access to technological devices by some learners. In a survey conducted by Mascheroni et al. (2021), 27% of parents in Italy reported that their children did not have access to technological devices for ERT. To ensure that all learners had access to ERT solutions, the Italian Ministry of Education, in collaboration with *Radiotelevisione Italiana*, Italy's national public broadcasting company, launched radio and television lessons to support learners without access to digital learning platforms (Pellegrini & Maltinti, 2020). Radio and television have become the best platforms to implement ERT in Italy due to their accessibility, ease of use and ability to bridge the digital divide (Pellegrini & Maltinti, 2020). Statistics show that in Italy, nearly 33 and 2.6 million people had access to the radio in 2019 and television in 2020, respectively (Statista, 2021c, 2021d).

### 3.3.2.3 Portugal

The Portuguese government, like other countries around the world, forced its Ministry of Education to temporarily close all schools on 16 March 2020 as a precaution to slow the spread of Covid-19 (Flores & Gago, 2020). The Portuguese Ministry of Education developed several ERT initiatives to ensure that teaching and learning never stopped. Firstly, on the day of school closures, the Portuguese Ministry of Education, in partnership with the National Agency for Qualification and Vocational Education, launched a website called *Apoio às Escolas* (Support to Schools) to provide teachers and learners with online resources to support ERT implementation (Cardoso & Bastos, 2021; Seabra et al., 2021). On this website, teachers also shared their pedagogical practices to promote fundamental learning in certain subjects and learners' competencies in a remote learning mode (Cardoso & Bastos, 2021).

Secondly, on 27 March 2020, the Portuguese Ministry of Education issued a document to guide schools and teachers in the development of their ERT plans (Cardoso & Bastos, 2021; Flores & Gago, 2020; Seabra et al., 2021). The document proposed eight principles that guided the development of ERT plan in schools, namely (1) Mobilising for change; (2) Communicating on a network; (3) Deciding on the ERT model; (4) Collaborating and articulating; (5) Teaching methodologies; (6) Selecting the technological means of distance teaching; (7) Caring for the school community; and (8) Tracking and monitoring (Cardoso & Bastos, 2021; Flores & Gago, 2020; Seabra et al., 2021). These principles offered teachers and schools guidance and recommendations for establishing an ERT strategy that considered their existing resources and conditions. In addition to these guidelines, the Portuguese Ministry of Education recommended the use of free synchronous platforms such as Google Classroom and Microsoft Teams for ERT (Cardoso & Bastos, 2021; Flores & Gago, 2020). In addition, some teachers used the Moodle, Zoom and Skype platforms as well as classroom WhatsApp groups that already existed in their schools prior to the outbreak of Covid-19 (Flores & Gago, 2020). To ensure that ERT took place in a safe online learning environment, the Portuguese Ministry of Education, in collaboration with the National Data Protection Commission, developed a set of security measures that schools had to follow while using the online learning platforms for ERT (Cardoso & Bastos, 2021).



Thirdly, on 15 April 2020, the Portuguese Ministry of Education, in partnership with the Universidade Aberta (Open University, Portugal), launched a training course for teachers titled “Training for Digital and Network Teaching” (Seabra et al., 2021). The course was aimed at equipping teachers with knowledge and skills in making progressive transitions to ERT (Nobre et al., 2021). Finally, on 20 April 2020, the Portuguese Ministry of Education collaborated with the *Rádio e Televisão de Portugal* to launch a television programme under the banner *#EstudoEmCasa* (*#StudyAtHome*) to broadcast educational lessons for learners in kindergarten to 9th grade (Cardoso & Bastos, 2021; Flores & Gago, 2020). This initiative was intended for learners with limited or no access to the internet or appropriate technological tools. The educational lessons were produced and presented by teachers and covered all curricular subjects (Cardoso & Bastos, 2021; Flores & Gago, 2020).

It is worth noting that one of the key and the most challenging issues presented by the Covid-19 pandemic to Portuguese schools was the inequality in access to ICT infrastructure, which prohibited certain learners from accessing digital educational content (Flores & Gago, 2020). To respond to this challenge, the Portuguese Ministry of Education partnered with local institutions and non-governmental organisations (NGOs) to provide learners in need with computers and internet hotspots, thereby reducing inequalities in access to education and providing a quality education for all (Seabra et al., 2021).

#### 3.3.2.4 Austria

The Austrian government took several steps to stem the spread of Covid-19, including temporarily closing all schools (Pelikan et al., 2021; Trültzsch-Wijnen & Trültzsch-Wijnen, 2020). As a result, the Austrian *Bundesministerium für Bildung, Wissenschaft und Forschung* (the Federal Ministry of Education, Science and Research) (BMBWF) ordered all schools to switch to ERT mode to ensure that teaching and learning could continue without disruptions (Trültzsch-Wijnen & Trültzsch-Wijnen, 2020). The BMBWF encouraged schools to use digital learning and communication platforms that were available to them before the pandemic to implement ERT (BMBWF, 2021). Prior to the pandemic, the BMBWF was already offering schools digital learning platforms such as *Eduvidual* and Learning with a System as well as communication platforms such as Microsoft Teams and the Google suite for education (BMBWF, 2021).

Although the BMBWF already offered these digital learning and communication platforms before the pandemic, their demand increased dramatically during the school closures due to the pandemic, necessitating an additional digital learning platform to meet the increased demand (National Interoperability Framework Observatory, 2021).

In response to the need for an additional learning platform, the BMBWF finalised its Eduthek learning platform, which had been in development before the pandemic, within seven days to assist teachers in implementing ERT at schools. The Eduthek platform provided a searchable archive of high-quality instructional materials for all subjects in kindergarten and elementary schools approved by teachers. The platform also provided learners with learning activities from other sources to practise at home and improve their abilities. In addition, the content available on the platform could also be integrated into other platforms such as *Eduvidual* and Learning with a System (Arshad, 2020; The World Bank, 2020). Furthermore, to improve the effectiveness of these learning platforms for ERT, the BMBWF published guidelines for using digital platforms for ERT based on the concept of distance learning (The World Bank, 2020).

The major challenge in using online learning platforms for ERT is the lack of access to the required digital devices by some learners. To address this challenge, the BMBWF collaborated with NGOs and launched the *#Learning* initiative with the aim of donating digital devices to needy learners (Wolfschwenger et al., 2021). In addition to supporting learners without access to digital devices, the BMBWF partnered with Österreichischer Rundfunk, the national public broadcaster in Austria, to broadcast educational lessons on television (Arshad, 2020; The World Bank, 2020). The lessons covered all the school subjects in kindergarten and elementary school.

### 3.3.2.5 Turkey

On 16 March 2020, the Turkish government ordered all schools to close temporarily and switch to ERT to combat the spread of Covid-19 (Özer, 2020). The Turkish government stated that ERT instruction would be conducted using the *Eğitim Bilişim Ağı* (Educational Informatics Network) (EBA) platform and the national television channel (Misirli & Ergulec, 2021; Tosun et al., 2021). EBA is a digital learning platform developed by the Turkish Ministry of National Education (MoNE) in 2011 as part of the Movement to Increase Opportunities and Technology project, known as the FATİH Project (Karanfil & Özet, 2021). The platform contained curriculum-based instructional

resources such as e-books, videos, activities that enhance learners' learning, as well as a synchronous audio-visual conferencing platform (Misirli & Ergulec, 2021; Tosun et al., 2021). Using the synchronous feature of the platform, live educational lessons were offered to primary and secondary school learners daily (Özer, 2020). The lessons were divided by grade levels. Lessons for primary school learners were offered between 09:00 and 14:00, while lessons for secondary school learners were offered between 09:00 and 16:00 (Özer, 2020).

Furthermore, the EBA platform included a tool for analysing learners' educational requirements based on data collected from their replies to activities. In this way, learners could access resources depending on their educational requirements and choose subject areas on which they wanted to focus and which examinations they wished to take. To support learners without access to the internet, MoNE collaborated with leading telecommunications companies in Turkey to provide learners with 8 gigabytes of free internet access (Özer, 2020). In addition, MoNE established walk-in EBA support centres, where learners who lacked a device or internet connection could use the devices in the centre to access the EBA platform (Tosun et al., 2021). Furthermore, MoNE, in collaboration with the Turkish Radio and Television Association, launched educational television lessons to reach learners without the required technological devices to access the EBA platform (Arshad, 2020; Duran, 2021). The Turkish Radio and Television Association dedicated six television channels to broadcasting educational lessons. These lessons were presented by teachers who had a track record of accomplishment in their field and had been chosen by MoNE (Tosun et al., 2021).

### 3.3.3 Discussion of the emergency remote teaching initiatives by developed and developing countries.

The Covid-19 pandemic forced all schools in both developing and developed countries to abruptly transition to ERT to maintain educational continuity. However, the speed of the switch from traditional face-to-face instruction to ERT varied between developing and developed countries, depending on their degree of preparedness and the availability of resources that could be quickly employed (Reimers, 2021). In developed countries, the shift to ERT was quick, smoother and required less effort than in developing countries (Saeed, 2020). For example, the transition to ERT was

quicker in developed countries such as Turkey and Austria, which had already made digital learning platforms available to schools prior to the pandemic (BMBWF, 2021; Misirli & Ergulec, 2021), while developing countries such as Zimbabwe and Rwanda could not quickly switch to ERT due to limited access by teachers and learners to resources required for ERT (Aminadab, 2020; Zinyemba et al., 2021).

The shift to ERT has exposed the digital inequalities that exist between developing and developed countries. The availability and accessibility of the internet has widened the gap in ERT between developed and developing countries (Morgan, 2020). In developing countries, a smaller proportion of learners have access to the internet at home than in developed countries (Morgan, 2020). For instance, in developed countries such as Portugal and Austria, 84% and 90% of households have access to the internet, respectively (Statista, 2021e, 2021f). In contrast, in developing countries such as Zimbabwe and South Africa, only 21% and 37% of households have access to the internet, respectively (Hanekom, 2020; Morgan, 2020). This shows that the shift to ERT greatly affected learners and teachers in developing countries.

It is essential to highlight that ministries of education of both developed and developing countries made various efforts to support schools with the transition to ERT. The ministries of education in both developed and developing countries, for example, established multiple initiatives to support ERT implementation in schools in collaboration with other government agencies, NGOs and private companies. NGOs and private companies are among the notable stakeholders that devised easing initiatives to assist schools and teachers in making the transition to ERT (Hove & Dube, 2021). The initiatives varied from one country to another, depending on the country's economic and educational structures. However, both developing and developed countries almost had similar ERT initiatives including establishing digital learning platforms, providing free access to the platforms and broadcasting educational lessons on national television and radio to support learners without access to the internet and digital devices, and partnering with major telecommunications companies to provide zero-rated access to educational websites.

Despite the different initiatives put in place by the ministries of education to support all learners in accessing ERT instruction, some learners still faced challenges (The World Bank, 2020). Interestingly, the challenges were similar in both developed and

developing countries. Lack of access to television, radio, digital devices and a steady internet connection were some of the challenges that affected learners, especially those from poor households to access ERT instruction (Bellei et al., 2021). Furthermore, while ministries of education in both developed and developing countries worked hard to ensure learning continuity through ERT, unfortunately, learners and teachers had to primarily rely on their own resources such as digital devices, television and radio (Schleicher, 2020).

During the beginning of school closures in both developing and developed countries, learners who lacked access to these resources were unable to continue learning. A report by UNICEF (2020) reveals that approximately 436 million learners worldwide could not access ERT instruction at the beginning of school closures due to a lack of resources required for learning at home. To support learners without access to resources needed for learning at home, some developing countries such as Zimbabwe and Argentina and developed countries such as Portugal distributed free printed educational materials to learners' homes (OECD, 2020; The World Bank, 2020). In addition, countries such as Argentina, Austria and Portugal provided needy learners with mobile devices such as tablets and laptops as well as internet access to continue learning at home during the school closures (Discover Society, 2020; Seabra et al., 2021; Wolfschwenger et al., 2021).

### **3.4 CHALLENGES FACED BY TEACHERS DURING THE TRANSITION TO EMERGENCY REMOTE TEACHING**

The abrupt and unexpected switch from face-to-face instruction to ERT presented new challenges for teachers (Cachón-Zagalaz et al., 2020; Misirli & Ergulec, 2021). Teachers faced considerable difficulties attributed to technological, pedagogical and social challenges in the transition to ERT (Ferri et al., 2020; Seabra et al., 2021; Shamir-Inbal & Blau, 2021). Technological challenges developed when teachers were faced with the need to immediately use various digital learning platforms for ERT without being trained (Shamir-Inbal & Blau, 2021). They also relate to lack of access to required digital devices by some learners and slow and unreliable internet connectivity (Ferri et al., 2020; Seabra et al., 2021). Numerous studies have found that teachers experienced difficulties related to learners' limited access to digital devices and internet connectivity when moving traditional classroom instruction to ERT (Gupta

et al., 2021; Khan & Mikuska, 2021; Muthuprasad et al., 2021; Oyedotun, 2020). A study by Trust and Whalen (2021) explored teachers' experiences and challenges of using technology for ERT. The findings indicated that teachers experienced several technological challenges when using technology for ERT, including lack of skills and knowledge in using technology and lack of access to technology by some learners. In another study by Jili et al. (2021), teachers reported several technological challenges such as lack of ICT infrastructure and exposure to ICT tools that may be used for ERT.

The pedagogical challenges were primarily related to teachers' lack of skills in using digital technologies for teaching (Yusuf & Jihan, 2020), teachers' lack of skills in designing digital learning environments that enhance learners' engagement (Ferri et al., 2020), teachers' inability to manage online resources (Mukhtar et al., 2020) and teachers' difficulties in establishing a social and cognitive presence in online learning (Seabra et al., 2021). Francom et al. (2021) examined the challenges experienced by teachers in the transition to distance learning. Their findings indicated that teachers faced various pedagogical challenges while transitioning to distance learning, including designing online learning experiences, engaging learners in learning activities and managing online resources. Another study by Rasmitadila et al. (2020) found that teachers experienced pedagogical challenges such as a lack of pedagogical knowledge of teaching remotely during the transition to ERT. Shamir-Inbal and Blau (2021) found that teachers were challenged with adapting their teaching methods to online learning.

The social challenges included learners' lack of interaction with one another and teachers, unavailability of physical spaces at home for teaching and learning, and lack of parental support for children's remote learning (Ferri et al., 2020). According to social constructivism theory, learning is a social process that occurs through learners' interactions with their classmates and teachers (Vygotsky, 1978). Dong et al. (2020) reported that social isolation and loss of physical social interactions between teachers and learners are the main drawbacks of ERT, as technology becomes the only platform for interaction among learners and their teachers. During ERT, parents are considered essential stakeholders, as they are the only ones who supervise their children's learning (Kong, 2020) and who physically accompany their children (Misirli & Ergulec, 2021). Parental involvement and support are the most critical factors for learners' learning during ERT due to the absence of teachers' physical presence. Ferri

et al. (2020) found that lack of parental involvement and support is one of the main challenges teachers experience while transitioning to ERT. Moreover, Mseleku (2020) states that because teachers' homes become their new working environment, lack of physical spaces for delivering ERT instruction is a challenge for conducting ERT.

### **3.5 BENEFITS OF EMERGENCY REMOTE TEACHING FOR TEACHERS**

Despite the considerable challenges experienced by teachers in the transition to ERT, there is some evidence that teachers also benefited from ERT. Ferri et al. (2020) conducted a study to understand the benefits of ERT for K-12 teachers in Israel. Data were collected qualitatively using an online questionnaire from 133 K-12 teachers. The study found that teachers benefited from ERT by becoming familiar with innovative digital learning tools and acquiring new teaching methods. A similar study conducted by Shamir-Inbal and Blau (2021) explored the benefits of ERT for elementary and secondary school teachers in Israel. The study employed a qualitative research method using an online questionnaire to obtain data from teachers. The findings showed that teachers perceived the transition to ERT as a chance for personal and professional empowerment imposed by the current circumstance. The study also found that throughout the transition to ERT, teachers felt motivated by the cooperation and support from learners and parents.

Jili et al. (2021) conducted a review of the literature on ERT opportunities for higher education institutions in South Africa. Their findings revealed that ERT promotes social coexistence and cohesion between students and lecturers, relieves lecturers and students of the financial burden associated with transport and accommodation costs, allows lecturers to teach from anywhere and at any time, and reduces incidents of abuse and gender-based violence. Erlam et al. (2021) explored the benefits experienced by academics during the transition to ERT in New Zealand. Using a quantitative research method, the study surveyed 67 academics at a New Zealand university. The results showed that academics experienced various benefits during the transition to ERT, including expanding networks, thereby increasing chances for lecturers to work collegially, reduced commuting time, enhanced lecturer creativity and flexibility in teaching from anywhere and at any time. In Oman, Mohammed et al. (2020) found that teachers acquired new skills and gained experience to respond to similar

circumstances in the future. Their study further points out that the transition to ERT bridged the gap between conventional and recent technological tools for teachers.

### **3.6 OVERVIEW OF WHATSAPP**

WhatsApp is a free instant messaging application for Android and iOS devices founded in 2009 by Brian Acton and Jan Koum (Gon & Rawekar, 2017). It is also accessible from a desktop computer as an extension of users' WhatsApp account on mobile devices. The name 'WhatsApp' is derived from the English phrase "What's up?", which means "What's new?" (Baguma et al., 2019; Dahdal, 2020). The application allows users to send and receive text and multimedia messages, make and receive voice and video calls, and exchange user locations and documents using their internet connection. In addition, WhatsApp has features such as unlimited messaging, automatically saving messages when the device is not connected to the internet or when it is turned off and creating a group chat with up to 256 participants. Furthermore, WhatsApp allows users to see whether their contacts are online, record an audio message or type a text message for them, and to see when they last accessed the application. In 2014, Facebook purchased WhatsApp for a value of \$19 billion (Wahyuni & Febianti, 2019) and since then, WhatsApp has grown to become the world's most popular instant messaging application, with over 2 billion users as of 2021 (Statista, 2021g). In South Africa alone, it is used by 23 million users for different purposes (Statista, 2021a). The popularity of WhatsApp could be attributed to its ease of use, timeliness and cost-effectiveness (Mars et al., 2019). WhatsApp has been integrated into education as a platform to facilitate teaching and learning due to its popularity among learners and teachers (Amin & Sundari, 2020).

#### **3.6.1 Educational affordances of WhatsApp**

The term 'affordance' was first introduced by James Gibson in his book *The senses considered as perceptual systems* in 1966 as a substitute for values from an ecological and psychological perspective (Gibson, 1966). In his article "The theory of affordances", Gibson (1977) clarified the definition of affordances and described it as what the environment affords or furnishes to individuals, whether for good or for bad. However, Gibson's definition of affordances was to only look at an environment from a natural point of view, ignoring the social and cultural ways of seeing it (Li, 2021). Norman (1988) later modified Gibson's definition of affordances to refer to the object's



perceived and actual fundamental properties that influence how the object can be utilised. Norman's definition of affordances considers the link between humans and technologies and the consequences for technology use (Li, 2021), thereby making it popular in technology acceptance research.

Acknowledging Norman's definition, educational affordances can be described as possibilities for learning that are determined and promoted by the perceived and fundamental properties of a technological tool (Xue & Churchill, 2019). According to Klein et al. (2018), the concept of educational affordances is often used to understand technology acceptance in education, as it is based on users' views of the possibilities and potentials of technology for teaching and learning. Therefore, in this study, the concept of educational affordances refers to the properties and features of WhatsApp for teaching and learning. Educational affordances of WhatsApp are worth exploring and discussing so that educational practitioners may better understand how WhatsApp can be used effectively to support learning and teaching. Furthermore, the increase in WhatsApp adoption and use in educational contexts makes it worth exploring what WhatsApp can afford. A study by Klein et al. (2018) identified five main educational affordances of WhatsApp: interaction, flexible learning, collaboration, social presence and knowledge sharing. The following subsections provide a discussion of each of the educational affordances of WhatsApp as identified by Klein et al. (2018).

#### *3.6.1.1 Interaction*

WhatsApp promotes interaction among learners and between teachers and learners (Klein et al., 2018). Baguma et al. (2019) contend that WhatsApp is a valuable tool for fostering social interaction among learners outside the traditional classroom. In a study investigating the use of WhatsApp for supporting communication in teaching and learning, Ujakpa et al. (2018) found that WhatsApp enhances student–lecturer interaction as well as student–student interaction.

#### *3.6.1.2 Flexible learning*

WhatsApp-based learning provides learners with a flexible learning experience by giving them the opportunity to choose when, where and how learning occurs (Baguma et al., 2019). It enables teaching and learning to take place at any time and from any location. Klein et al. (2018) point out that WhatsApp promotes learner-centred learning by permitting numerous entry points and flexible learning pathways, facilitating multi-

modality and allowing students to improvise in real time (Klein et al., 2018). Rambe et al. (2020) found that WhatsApp improves students' flexible learning by expanding options for academic discussions at students' convenience.

### *3.6.1.3 Collaboration*

WhatsApp facilitates online collaboration among learners and teachers in the teaching and learning process (Mtega, 2021). Dahdal (2020) asserts that learners commonly use it to collaborate on class assignments. Teachers, on the other hand, use it to monitor how learners collaborate on assignments and other learning activities (Arifani et al., 2020). According to Bere (2012), WhatsApp provides the following collaboration features:

- **Group Chat:** It allows teachers to create class WhatsApp groups of up to 256 members.
- **Unlimited messaging:** It enables teachers and learners to send unlimited messages.
- **Multimedia:** It enables teachers and learners to send and receive voice notes, images, videos and text messages.

Syah (2020) explored the use of WhatsApp for collaborative learning among students in an English course and found that WhatsApp is a useful tool to facilitate collaborative learning among English students. Another study by Udenze and Oshionebo (2020) probed the degree to which WhatsApp may facilitate collaborative learning among university students in Nigeria and reported that class WhatsApp groups facilitate collaborative learning to a great level.

### *3.6.1.4 Social presence*

In the field of online learning, social presence is generally described as “the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities” (Garrison, 2009, p. 352). According to Klein et al. (2018), WhatsApp fosters social presence because of its instantaneity. When new messages arrive, a push notification displays as an alert on the screen, allowing learners and teachers to begin real-time chats as if they are communicating face to

face (Tang & Hew, 2020). Baguma et al. (2019) state that WhatsApp discussion groups provide a good way for promoting the development of social presence among students. Robinson et al. (2015) analysed first-year radiography students' postings on a WhatsApp group created to develop their social presence and found that WhatsApp provided them with a platform on which they could display all the traits necessary for the development of a social presence.

#### *3.6.1.5 Knowledge sharing*

WhatsApp allows teachers and learners, as well as learners and learners, to share knowledge in a variety of situations through text, voice notes, video, images and many more (Klein et al., 2018). Baguma et al. (2019) contend that WhatsApp-based learning allows learners to exchange knowledge, information and experiences through conversation and comments, fostering their ability to think critically through the analysis and assessment of their peers' views rather than a single learner's point of view. A study to examine how students perceive WhatsApp as a knowledge-sharing tool in a rural university in South Africa during the Covid-19 pandemic found that WhatsApp provides a good platform for knowledge sharing among students, especially during closures due to Covid-19 pandemic (Mbodila et al., 2020).

### **3.7 WHATSAPP AS A PLATFORM FOR EMERGENCY REMOTE TEACHING**

During the school closures due to Covid-19, selecting an appropriate digital platform for ERT was challenging for most teachers. Wulandari and Mandasari (2021) contend that teachers had to quickly choose a digital platform for ERT that met the learning needs of their learners to ensure that education continued despite the school closures. In addition, teachers had to consider the benefits, utilisations and drawbacks of selecting such a particular platform for ERT (Wulandari & Mandasari, 2021). Ramdhan et al. (2020), name five factors that were considered by teachers when selecting an online learning platform for ERT, namely mental health, interpersonal relationships, motivation, content and instructions. Accordingly, teachers chose different digital tools such as Google Meet, Google Classroom, Zoom, WhatsApp and LMSs as platform for ERT. However, WhatsApp emerged as the most commonly used tool for delivering ERT at all school levels due to its popularity and availability among teachers and learners (Amin & Sundari, 2020).

In addition to its popularity and availability, WhatsApp could be quickly leveraged to implement ERT due to its ease of use. Maphosa et al. (2020) observed that during the Covid-19 pandemic, WhatsApp was the only simple tool that could be quickly used for teaching and learning without training provided to learners and teachers. Khan (2021) states that during the Covid-19 pandemic, numerous developing countries relied on WhatsApp for ERT owing to insufficient infrastructure and a shortage of skilled human resources for sophisticated online learning practices. Barhoumi (2015) affirms that it is easy to deploy WhatsApp as a teaching and learning tool in resource-constrained settings due to its ease of use and low cost. The use of WhatsApp as a platform for ERT during the Covid-19 pandemic gained worldwide momentum (Al Abiky, 2021), and several studies have been conducted to investigate its effectiveness as a teaching and learning tool (Ramdhani & Nandiyanto, 2021; Susilawati & Supriyatno, 2020).

Mustafa and Yaakub (2021) investigated the effectiveness of WhatsApp as a teaching and learning tool of Bahasa Malaysia in Malaysia and reported that WhatsApp is an effective tool for teaching this language. In Saudi Arabia, Al Abiky (2021) probed the effectiveness of using WhatsApp for learning English as a foreign language (EFL) and concluded that WhatsApp is an effective tool for learning EFL. Another study by E. A. Jackson (2020) investigated the effectiveness of the use of WhatsApp for supporting teaching and learning in six selected higher education institutions in Sierra Leone. The findings demonstrated that WhatsApp is an effective tool for supporting learning experiences considering that it is free and easy to access from anywhere. In another study, Nsabayezu et al. (2020) investigated Rwandan secondary school teachers' perceptions of using WhatsApp to support the teaching and learning of chemistry. Data were collected from 18 chemistry teachers from selected secondary schools in Nyarugenge and Kicukiro Districts using a survey questionnaire. The results revealed that teachers perceived WhatsApp as an effective tool for teaching chemistry and supporting learners' learning.

Furthermore, WhatsApp has several features that make it an effective platform for ERT (Al Abiky, 2021). One such feature is the option to create chat groups that serve as teaching and learning platforms for learners from the same class (Baishya & Maheshwari, 2020). Furthermore, class WhatsApp groups are valuable and efficient ways for communicating and sharing learning materials with the entire class. Zan (2019) found that high school teachers use class WhatsApp groups for five main

purposes, namely communicating with the whole class, establishing a platform for teaching and learning, encouraging information sharing among learners, increasing learners' motivation in learning and providing learners with the opportunity to plan their studies. Moreover, WhatsApp has other robust features, such as audio and video files, voice and video calls, text messages and links to website addresses that provide teachers with new opportunities for teaching, particularly during the Covid-19 pandemic. Bonsu et al. (2021) observed that due to the robustness of its features, WhatsApp is now used as a teaching and learning platform across the world, especially during the Covid-19 pandemic.

The use of WhatsApp as a platform for ERT during the Covid-19 pandemic has been extensively investigated in the literature (Bonsu et al., 2021). Research indicates that when used for ERT, the application supports online learning (Asmara, 2020; Mulyono et al., 2021; Munir, Erlinda & Afrinursalim, 2021), enhances learners' motivation for learning (Alamer & Al Khateeb, 2021; Maphosa et al., 2020; Susilawati & Supriyatno, 2020), increases learner engagement (Motaung & Dube, 2020; Rabbianty & Wafi, 2021), promotes teacher–learner social interactions (Tarisayi & Munyaradzi, 2021) and develops a social presence between teachers and learners (Nel & Marais, 2020). Oriji and Anikpo (2019) state that WhatsApp can facilitate teamwork and collaboration among teachers. In Indonesia, Budiando and Yudhi (2021) studied learners' and teachers' perceptions and practices of using WhatsApp as a primary platform for teaching and learning during the Covid-19 pandemic. Using a mixed method, data were collected through an online survey from 198 EFL learners and 119 teachers in 42 East Java senior high schools. The findings revealed that learners and teachers perceived WhatsApp as a suitable primary platform for teaching and learning. The researchers emphasised that WhatsApp in teaching and learning should not be limited to its traditional role as a supporting tool.

### 3.7.1 Benefits of using WhatsApp for emergency remote teaching

More recently, WhatsApp has become a primary platform for teaching and learning with great benefits for teachers and learners, particularly during the Covid-19 pandemic. In addition, the effectiveness of WhatsApp in teaching and learning generates great benefits for teachers and learners. A review of the literature reveals several benefits of using WhatsApp for ERT. A plethora of studies indicates that

learning from anywhere and at any time is the main benefit of using the application for ERT (Abubakar, 2021; Alsharif et al., 2020; Bonsu et al., 2021; Munir, Erlinda, Putra, & Afrinursalim, 2021; Rahaded et al., 2020; Rahmawati, 2021). Other commonly cited benefits of using WhatsApp for ERT in the literature include its availability among teachers and learners (Nsabayezu et al., 2020), ease of use (Maphosa et al., 2020), cost-effectiveness (Rahaded et al., 2020) as well as easy accessibility of learning materials (Nuuyoma et al., 2020).

A number of studies attempted to identify the benefits of using WhatsApp as a teaching and learning platform (Alsharif et al., 2020; Aziz et al., 2021; Cetinkaya, 2017; Chakraborty et al., 2020; Gon & Rawekar, 2017). The results of these studies revealed the technical, educational and academic benefits of using WhatsApp as a platform for teaching and learning. The technical benefits were identified as it being cost-free, the ease of use, the immediacy of responses, its easy accessibility and availability, and it being easily downloadable. The educational benefits were identified as comfort in self-expression, establishing a sense of belonging and increasing student-to-student communication. The academic benefits included easy access to learning materials, teacher availability, providing a secure learning environment and providing the option to continue learning at any time. The studies further concluded that the technical, educational and academic benefits of using WhatsApp as teaching and learning platform far outweigh the drawbacks.

Munir, Erlinda, Putra and Afrinursalim (2021) explored the advantages of using WhatsApp as a learning tool during the Covid-19 pandemic in Indonesia and concluded that the application is effective and easy to use, saves internet data, the features are helpful, it makes communication easier, and it better allows lecturers to keep an eye on their students. Alwaely (2018) examined school teachers' benefits of using WhatsApp as an educational tool in Jordan. Data were collected quantitatively using a questionnaire from 114 Arabic language teachers. The study results showed that teachers considered WhatsApp to be an effective collaborative language teaching tool. In addition, the results demonstrated that WhatsApp provides a convenient way for sharing and accessing educational materials and creates a motivating teaching and learning environment.

Alwaely (2018) further observed that WhatsApp has become an effective tool for facilitating the 'bite-sized teaching method', which enables teachers to break down learning materials into manageable chunks. This teaching method offers a number of benefits for learners, including making the learning process easier and less daunting (Alwaely, 2018). The simple, easy and on-demand access of educational content on WhatsApp is especially beneficial to learners with special educational needs, as it allows them to meet their unique demands. Furthermore, WhatsApp archives those little chunks of learning content in chronological order, allowing both teachers and learners to access and revisit them easily. In Malaysia, Singh et al. (2020) employed a descriptive case study to probe English language teachers' teaching strategies through various platforms such as Zoom, Google Classroom, WhatsApp and Telegram. The findings indicated that WhatsApp was the most popular platform used by teachers to engage learners in the learning process. The findings also indicated that WhatsApp allowed learners to quickly contact their teachers if they experienced difficulties while working on the learning content.

Yulianawati and Anggrarini (2021) investigated teachers' perspectives of using WhatsApp for teaching the English language in Indonesia. Data were collected qualitatively through an interview and a questionnaire from five high school teachers. Teachers reported that WhatsApp is a valuable tool for teaching English, allowing them to quickly share educational materials, explain the learning materials and provide instruction before, during and after the learning. The teachers further reported that WhatsApp uses low internet data, and it allows them to communicate with the learners efficiently. Suryana et al. (2021) conducted a narrative inquiry to investigate language teachers' perceptions and experiences of using WhatsApp for ERT in Indonesia. The findings of the inquiry revealed that teachers had positive perceptions and good experiences with the use of WhatsApp for language teaching. In addition, the findings indicated that WhatsApp is the most popular platform for ERT compared to other digital platforms such as Zoom and Google Classroom.

Wulandari and Mandasari (2021) are of the view that WhatsApp presented considerable beneficial features that supported ERT during the Covid-19 pandemic. Alwaely (2018) points out that WhatsApp enables teachers and learners to easily access a wide range of digital learning materials in various forms, including voice notes, images, videos, text and documents. Nuraeni and Nurmalia (2020) found that

the application enabled teachers and learners to easily communicate and exchange information using its features such as videos, audios and images. Furthermore, WhatsApp groups have become platforms for ERT with great benefits for learners and teachers. In a study conducted by Yuzbasioglu et al. (2020), students improved their academic knowledge through interactions in WhatsApp groups. Susilawati and Supriyatno (2020) maintain that using WhatsApp groups as platforms for teaching and learning provide pedagogical, social and technological benefits. According to them, WhatsApp groups are easy to create and use; facilitate online collaboration and collaborative learning between teachers and learners; make it easy to share documents, sounds, videos, images and texts messages; allow learners and teachers to easily create and disseminate knowledge through the various features of the application; and allow teachers to easily distribute announcements and learners to publish their work groups.

### 3.7.2 Disadvantages of using WhatsApp for emergency remote teaching

Along with the potential benefits of using WhatsApp as an ERT platform, studies have also found several disadvantages of using it. Maphosa et al. (2020) contend that despite the great benefits of using WhatsApp as a platform for ERT, there are also drawbacks associated with its use that warrant discussion. Nhongo and Tshotsho (2021) postulate that although WhatsApp is a convenient tool to facilitate ERT, its effectiveness is impeded by the unaffordability of internet data, lack of access to smartphones and unavailability of mobile network coverage. In a study by Grover et al. (2020) in India, students reported unavailability of smartphones and internet connectivity issues as the main disadvantages of using WhatsApp for learning pathology. Another study by Chirinda et al. (2021) in South Africa found that most learners could not view and download educational materials on WhatsApp due to insufficient data. Cetinkaya (2017) warns institutions to be careful when using WhatsApp as a teaching and learning tool, as research found that some students lost concentration, used inappropriate language and had relationships beyond academic discourse. Zayyanu and Yunusa (2021) assert that when WhatsApp is used as a teaching and learning tool, students easily lose concentration and interest in learning. Nuraeni and Nurmalia (2020) identified some disadvantages of using WhatsApp for teaching and learning, including extra time required to prepare the content, some



students acting as silent readers and not participating in discussions, tasks frequently being copied and pasted, and students' lack of attention to learning materials. Tragant et al. (2021) observed that when learners and teachers are in different environments and participate in certain activities, they may not pay complete attention to messages, resulting in a lack of in-depth discussion and meaningful discourse, both of which are anticipated in a learning setting. Furthermore, Djamdjuri and Kamilah (2020) also identified other disadvantages of using WhatsApp for online learning, including limited video conferencing and slow response time when there are many incoming messages.

Moreover, like the benefits, studies have also classified the drawbacks of WhatsApp as a teaching and learning tool into three categories: technical, educational and instructional (Alsharif et al., 2020; Gon & Rawekar, 2017). The technical drawbacks of using WhatsApp as a teaching and learning platform are principally associated with message flooding, it being time-consuming to keep track of posts in WhatsApp groups, lack of access to smartphones by some learners and eye strain (Alsharif et al., 2020; Gon & Rawekar, 2017). The educational drawbacks are mainly related to learners' use of inappropriate language in class WhatsApp groups and high expectations of teachers' availability (Alsharif et al., 2020; Gon & Rawekar, 2017). The instructional drawbacks are associated with learners sharing learning material to impress their teachers and without learning about it and some learners not making any effort to learn (Alsharif et al., 2020; Gon & Rawekar, 2017).

In Turkey, Cetinkaya (2017) identified the technical, educational and academic drawbacks of using WhatsApp for educational purposes. The technical drawbacks of WhatsApp included short battery life of smartphones, low smartphone memory capacity, faulty smartphones and the problem of internet connection. It is worth noting that these drawbacks are frequently associated with smartphones equipped with WhatsApp and internet connectivity, rather than with the application itself. The educational drawbacks included learners leaving the WhatsApp group for technical reasons or for no reason at all, difficulty in editing the posts and the use of slang. The academic drawbacks of utilising WhatsApp for educational purposes included distraction to learning and that deleted posts cannot be recovered. Dar et al. (2017) argue that using WhatsApp at any time and from any location may distract users, as most interactions may occur when teachers and learners are engaged in teaching and learning activities.

### **3.8 SUMMARY**

This chapter provided an extensive review of the literature related to the phenomenon under investigation. It has been noted that despite the school closures due to the Covid-19 pandemic, education in all levels of schooling continued through an alternate temporary mode termed 'emergency remote teaching'. Teachers used various digital platforms to implement ERT, and WhatsApp emerged as the most commonly used platform. It was noted that both developed and developing countries established almost similar initiatives to support ERT implementation in schools. Furthermore, it has also been highlighted that notwithstanding the challenges experienced by teachers when transitioning to ERT and when using WhatsApp as a platform for ERT, there is evidence that teachers also benefited from ERT and from using WhatsApp as a platform for ERT. It is worth noting that benefits of ERT for teachers outweigh the challenges, as some of the challenges were addressed by the different ERT initiatives by ministries of education. The next chapter describes the research design and methodology of this study.

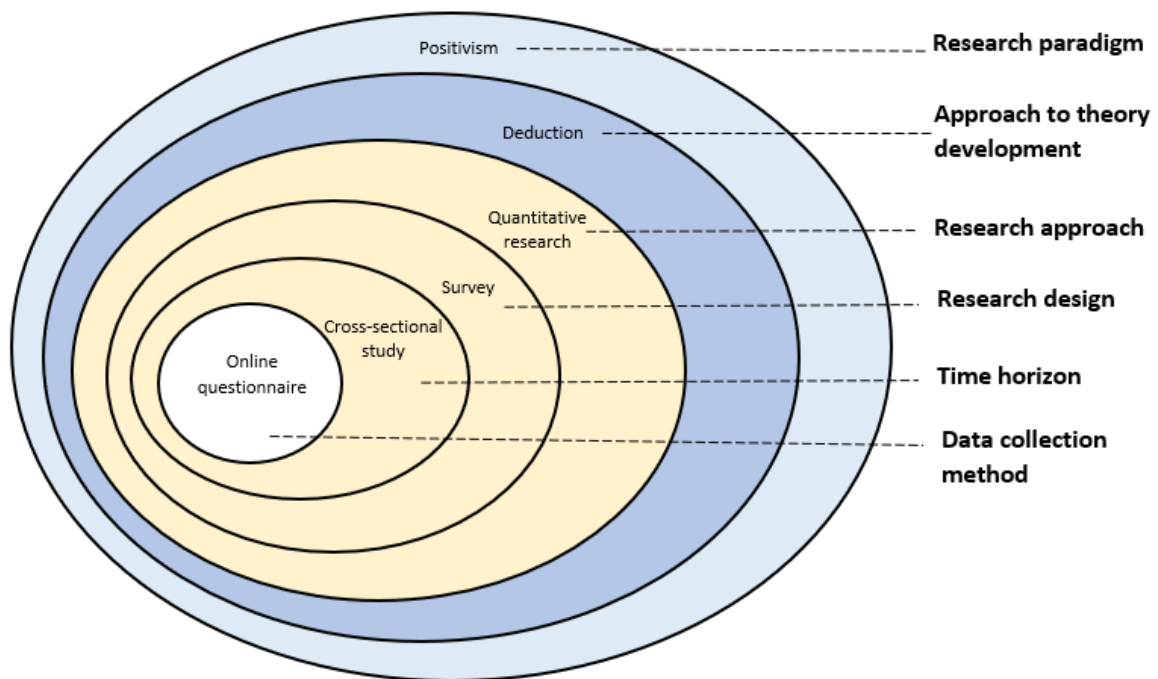
## CHAPTER 4

### RESEARCH DESIGN AND METHODOLOGY

#### 4.1 INTRODUCTION

The preceding chapter reviewed the literature related to the study phenomenon. This chapter focuses on the research design and methodology employed in this study to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for ERT. Research design is the overarching strategy or plan that outlines how a research study is structured (Creswell, 2008; McMillan & Schumacher, 2014). Research methodology, on the other hand, determines how the research will be conducted (Ragab & Arisha, 2018). Mafuwane (2011) expresses concerns about new and emerging researchers using the research design and research methodology concepts interchangeably. Therefore, it is worth emphasising that research design and research methodology are not synonyms and may not be used interchangeably.

This chapter describes the research design and methodology followed to address the research questions and test the stated hypotheses. The present study adapted the 'research onion' proposed by Saunders et al. (2019) to represent the research process. Saunders et al. (2019) view the research process as peeling an onion layer by layer from the outer layer to the inner layer. The layers indicate the stages of the research process that need to be followed when conducting a research study. Figure 4.1 shows the research onion for this study and the different layers that were considered. The research onion for this study was divided into six different layers: 1) the research paradigm underpinning the study; 2) the approach to theory development adopted; 3) the research approach chosen; 4) the research design selected; 5) the time horizon; and 6) the data collection method used in this study, as shown in Figure 4.1. The different layers of the research onion considered in this study are described in detail in the sections of this chapter.



**Figure 4.1: The research onion for the current study**

This chapter is divided into 10 sections. It starts by discussing the philosophical underpinning of the study. Secondly, the approach to theory development adopted in this study is described. Thirdly, the research approach used in the present study is described. Fourthly, a discussion on the research design employed in the current study is presented. Fifthly, the study population and the sampling procedure are explicated. Sixthly, the data collection method is discussed. Seventhly, the data analysis procedures employed are discussed. Eighthly, the measures taken to ensure reliability and validity are identified and discussed. Ninthly, the results of the pilot study are presented. Finally, the ethical considerations followed in this study are explained.

## **4.2 RESEARCH PARADIGM**

Saunders et al. (2019) explain that the first stage of the research process is to describe the philosophical underpinnings of the study. Ragab and Arisha (2018) contend that the first step in the research process is determining the study's philosophical assumption using a research paradigm. Creswell (2007) points out that the research process starts with the philosophical perspective made by the researcher before conducting a research study. Several paradigms have been proposed for conducting educational research by different researchers and scholars in the literature (Okesina,

2020). However, the most commonly used paradigms in educational research are positivism, interpretivism and pragmatism (Ugwu et al., 2021). This study was located within the positivism research paradigm. According to Ugwu et al. (2021), positivism was coined by the French philosopher Augustine Comte to describe a philosophy that focuses on observation and reason to describe human behaviour or that views humans as phenomena that can be examined scientifically. Saunders et al. (2019) explain positivism as a philosophical perspective in the natural science that deals with observable social reality to develop 'law-like' generalisations. Park et al. (2020) state that positivists usually employ the deductive approach to identify a theory to be studied from the literature, formulate hypotheses, design an experiment and undertake empirical research based on experimentation. According to them, the results of such empirical study are used to enhance or refine the theory and add to the existing body of knowledge (Park et al., 2020).

The ontological assumption of positivism is realism or single reality (Khatri, 2020). This suggests that positivism assumes the existence of a single objective reality that can be comprehended, quantified and measured. The epistemological perspective of positivism is objectivism (Park et al., 2020). Positivists believe that knowledge must be created objectively, without being influenced by the values of the investigator or participants. This implies that the investigator and the study phenomena are two distinct entities, none of which affect the other. Research conducted on the positivism paradigm often relies on experimental methodology (Rehman & Alharthi, 2016). Experimental methodology entails manipulating one variable (explanatory or predictor variable) to see whether changes in that variable result in changes in another one (dependent variable). At the axiological level, positivism relies on beneficence axiology (Kivunja & Kuyini, 2017). Beneficence axiology entails that all research must strive to maximise positive results for the study, humankind and the study participants (Mertens, 2015). It also suggests that the researcher should try to eliminate or at the very least reduce any danger, injury or error that may arise throughout the study. Therefore, based on the ontological, epistemological, methodological and axiological assumptions of positivism, it can be concluded that the positivism paradigm advocates the use of quantitative research.

The present study was located within the positivism paradigm for the following reasons. Firstly, positivists advocate using a quantitative research approach (Ugwu et

al., 2021). Habib (2020) asserts that positivist studies employ quantitative measures to gather empirical data and explain human behaviour. Maree (2016) contends that research located in positivism philosophy relies on collecting quantitative data and involves hypothesis testing. Therefore, in the present study, quantitative data were collected from secondary school teachers to validate the proposed extension of the UTAUT2 and test the formulated hypotheses. Secondly, the quantitative data that positivists use to address the research question and test the formulated hypotheses can be gathered using closed-ended questionnaires (Rehman & Alharthi, 2016). Therefore, in this study, an online closed-ended questionnaire was designed and developed to collect data from secondary school teachers.

Thirdly, positivism aims to find explanatory associations or causal links that may be used to anticipate and regulate the research problem (Park et al., 2020). Kivunja and Kuyini (2017) affirm that positivism searches for cause-and-effect links in order to explain and anticipate measurable outcomes. In other words, positivists hold the view that the research problem is caused by several factors, and therefore the researcher should investigate the causes of the dependent variable. Therefore, in this study, secondary school teachers' acceptance and use of WhatsApp for ERT are caused by other independent variables; these are performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness and self-efficacy. Finally, positivist studies usually employ sophisticated statistical techniques to analyse data (Ryan, 2018). Therefore, this study used statistical techniques to empirically test the proposed extension of the UTAUT2 and stated hypotheses. Based on the above reasons for selecting the positivism paradigm as a philosophical paradigm for the present study, it can be concluded that the study employed the quantitative research approach to address the research question and test the formulated hypotheses. The next section discusses the approach to theory development for this study.

#### **4.3 APPROACH TO THEORY DEVELOPMENT**

Saunders et al. (2019) name three main approaches for developing theories: inductive, deductive and abductive. The inductive approach begins with the observation of the phenomenon and data gathering, and progresses to description and analysis in order to develop a theory (Melnikovas, 2018). In the deductive approach, one starts with an

existing theory, formulates hypotheses, gathers data and analyses them to confirm or reject the hypotheses (Melnikovas, 2018). The abductive approach often begins with surprising facts and moves between deduction and induction to discover the most plausible explanations (Melnikovas, 2018). Based on the above explanations of the inductive, deductive and abductive approaches, it can be concluded that the inductive approach is typically used for developing theories, whereas the deductive approach is usually used for testing existing theories, while the abductive approach combines both inductive and deductive approaches.

For this study, the deductive approach was adopted, because it is usually associated with quantitative research (Abdukarimova & Zubaydova, 2021). Furthermore, research located within the positivism paradigm usually employs the deductive approach to identify a theory, formulate hypotheses, gather data and statistically analyse the data to confirm or reject the hypotheses, which is the case in this study. The current study employed the UTAUT2 as the guiding theoretical framework to develop the proposed extension of the UTAUT2, formulate the hypotheses and provide operational definitions.

#### **4.4 RESEARCH APPROACH**

The research approach is a plan and procedure for conducting research consisting of the steps from broad assumptions to precise data collection methods, analysis and interpretation (Creswell, 2014). The plan entails multiple decisions, including determining which approach should be employed to investigate the research problem (Creswell, 2014). There are three common approaches to conducting research: quantitative, qualitative and mixed methods (Grønmo, 2019; Scalcău, 2021). It is crucial for researchers to choose the most appropriate approach to answer their research questions successfully. The choice of the appropriate research approach is usually influenced by the nature of the research problem, the researcher's personal experiences and the study's target audience (Creswell, 2014). In addition, the choice of a research approach is influenced by the aim of the study, the nature of the research questions to be addressed and resource availability (Ponto, 2015). Therefore, the quantitative research approach was selected and employed in this study.

Quantitative research is viewed by Burns et al. (2015) as a formal, objective, systematic procedure for describing variables, testing associations among them and

investigating cause-and-effect relationships among the variables. Creswell (2014) states that these variables may be measured using instruments, resulting in numerical data that could be analysed using statistical techniques. Furthermore, the quantitative approach involves the generation of quantifiable data and is informed by the positivism research paradigm (Davies & Fisher, 2018). Therefore, the selection of the quantitative research approach for this study was influenced by the positivism paradigm within which the study was located. The quantitative approach was also employed in this study due to its appropriateness for validating theories and testing hypotheses. Therefore, the quantitative approach was employed to validate the proposed extension of the UTAUT2 and test the stated hypotheses.

Furthermore, the quantitative approach was deemed suitable for this study because other researchers (Creswell, 2014; Kivunja & Kuyini, 2017) indicated that it is appropriate when the aim of the study is to investigate the elements that have an impact on an outcome. The choice of the quantitative approach is also justifiable because the UTAUT2, which was the guiding theoretical framework for this study, is quantitative, and most studies that applied the UTAUT2 to investigate the factors influencing users' acceptance and use of technology used the quantitative approach (Gunasinghe et al., 2019; Hammouri & Abu-Shanab, 2018; Saputra et al., 2020; Siron et al., 2020; Yakubu & Dasuki, 2019). Tamilmani et al. (2019) corroborate that research studies employing the UTAUT2 as a theoretical underpinning typically adopt a quantitative approach. Moreover, Ragab and Arisha (2018) name several benefits of using the quantitative research approach, including collecting data from a larger sample within a short period, data analysis being less time-consuming and generalising research results to the population within which the sample was drawn.

It is worth indicating that in a research process, not only does the researcher choose the research approach, but also the research design to be employed in that approach. Therefore, the following section describes the research design used in this study.

#### **4.5 RESEARCH DESIGN**

According to O'Sullivan et al. (2016), the research design is a plan that guides decisions regarding when and how to gather and analyse data. It is important for researchers to choose a research design that will enable them to successfully answer their research questions. However, the choice of the appropriate design is influenced



by other factors, including the research approach, the research problem, the target population and the investigator's experience (Creswell, 2014). Therefore, for this study, a survey research design was selected.

A survey research design is a research procedure in which the researcher administers a survey to the whole population or a subset of the population to describe the characteristics, behaviours, perceptions, beliefs, opinions or attitudes of the population (Creswell & Hirose, 2019). In a survey research design, researchers use questionnaires or interviews to collect quantitative data and perform statistical analyses to identify patterns in replies to questions and to validate the stated hypotheses (Creswell & Hirose, 2019). Moreover, the survey research design was selected for the current study because it has been widely reported to be useful in measuring people's attitudes, beliefs and behavioural intentions (Creswell & Creswell, 2018). Furthermore, the survey research design has been widely adopted by several studies investigating factors influencing technology acceptance and use (Chayomchai et al., 2020; El-Masri & Tarhini, 2017; Joo et al., 2018; Salloum et al., 2019).

The survey research design was deemed appropriate for this study, as it allows the researcher to examine the relationships among variables (Asenahabi, 2019). Sjoberg et al. (2007) assert that survey research is valuable when the investigator wants to explore many variables with a large sample size and through thorough statistical analysis. Furthermore, the choice of the survey research design is justifiable, because it enabled the researcher to collect data from a large sample of the population within a short period using a closed-ended questionnaire (see Creswell & Hirose, 2019). Asenahabi (2019) points out that the main benefit of survey research is that it provides information on a large sample of individuals with minimal effort and at a low cost. The rationale for selecting the survey research design is justifiable, because it is usually associated with the positivism research paradigm (Alderson, 2021). Finally, the survey research design was selected due to its association with the quantitative research approach (Kumatongo & Muzata, 2021). In this study, the survey research design allowed the researcher to gather quantitative data to answer the research questions and test the stated hypotheses.

#### **4.6 POPULATION AND SAMPLING**

Population and sampling are two important concepts in survey research. Survey research is usually conducted on a sample that is representative of the target population (Creswell & Hirose, 2019). This requires survey researchers to choose the appropriate sampling technique to select a representative sample. Taherdoost (2016a) states that the first step in selecting a sampling procedure is to explicitly describe the population to be reached. Therefore, this section starts by describing the target population for this study and thereafter describes the sampling procedure employed as well as the justification of its choice.

#### 4.6.1 Population

The population of this study comprised 248 teachers from seven public secondary schools in the Namakgale Circuit in Limpopo province, South Africa who were using WhatsApp for ERT. These secondary schools were chosen because the Namakgale Circuit recommended and encouraged them to use WhatsApp for ERT. Researchers have observed that it is often not feasible to gather data from the whole population due to its large size as well as time and resource constraints (Cohen et al., 2017; Majid, 2018; Ragab & Arisha, 2018; Shukla, 2020). Instead, data are often collected from the sample of the population and research results are then applied to the whole population (Abt et al., 2020; Creswell & Hirose, 2019; Shukla, 2020). A sample is a subset of the population and is usually selected using sampling methods (Shukla, 2020). The following section provides a discussion of the sampling method selected for this study and the justification for its selection.

#### 4.6.2 Sampling

The present study employed a convenience sampling method to choose a sample of 215 secondary school teachers from the target population of 248 secondary school teachers in the Namakgale Circuit (Namakgale Circuit, 2022). To calculate the sample size for this study, an online sample size calculator available on Creative Research Systems website was used with a confidence level of 95% and a confidence interval of 5%. The results showed that the minimum sample size for this study was 151. Therefore, a sample size of 215 secondary school teachers was considered sufficient for this study. Krupnikov et al. (2021) explain convenience sampling as a type of non-probability sampling in which individuals in the population are chosen based on their desire to participate, availability at a specific time, geographic proximity

and easy accessibility. It is also known as 'accidental sampling' or 'haphazard sampling', as individuals may be chosen in the sample merely because they are located near to where the researcher is collecting data (Etikan et al., 2016).

The respondents for this study were selected based on their accessibility and willingness to participate in the study. The researcher opted for the convenience sampling method because the respondents were most accessible to the researcher. In addition, convenience sampling is inexpensive and simple to use (Etikan et al., 2016). The choice of this sampling method is also justifiable because most studies investigating the factors influencing technology acceptance used convenience sampling to select respondents (Alam et al., 2018; Liebenberg et al., 2018; Masmali & Alghamdi, 2021; Mokhtar et al., 2018). Furthermore, Lee and Landers (2022) observed that non-probability sampling methods such as convenience sampling are common in modern quantitative research due to time constraints. Therefore, the convenience sampling method allowed the researcher to conveniently collect a large amount of data within a short period (see Etikan et al., 2016). Pierce et al. (2020) assert that convenience sampling is appropriate when the researcher wants to quickly collect data. Another reason for using convenience sampling is the assumption that the target population is homogeneous (Etikan et al., 2016). This means that the research results for this study would be the same as the ones obtained from a random sample.

#### **4.7 DATA COLLECTION METHOD**

Data collection methods could simply be described as the techniques that researchers use to gather data (Mosweu & Mosweu, 2020). Data collection methods are aimed at collecting data in a uniform manner from all research participants. This implies that a specific set of questions should be asked, or a certain type of data must be gathered, for every individual in the sample. Moyo (2017) states that methods of data collection are an important part of the research process because they offer the analytical foundation for finding answers to a specific research question. Different data collection methods can be used to collect data for a research study, depending on the research design and the nature of the research question (Nardi, 2018). In survey research, the most common data collection methods are interviews and questionnaires (Creswell & Hirose, 2019; Ponto, 2015). An interview is a method of data collection in which the researcher records the responses provided by the research participants (Creswell &

Hirose, 2019). A questionnaire, however, is a data collection instrument in which the research participants answer a collection of questions and return them to the researcher (Creswell & Hirose, 2019). Lavrakas (2008) defines it as a sequence of standardised questions, sometimes referred to as 'items', that follow a predetermined format in order to gather individual information on one or more specified themes. It can be noted that both methods of data collection gather data by directly asking research participants questions instead of observing their behaviour. Yusoff et al. (2021) state that among the two data collection methods, a questionnaire is the most widely employed method in survey research. Therefore, data for this study were gathered using a questionnaire.

The selection of a questionnaire over an interview as a data collection method for this study is justifiable, because a questionnaire is a more convenient and cost-effective way of gathering large data from a large sample in a short period than an interview (Kabir, 2016). Furthermore, questionnaires are suitable for collecting data to test hypotheses (Ragab & Arisha, 2018). According to Nardi (2018), questionnaires may be distributed to participants in paper format, provided electronically by e-mail or internet-based applications, or a mix of the two, allowing the participants the choice of whatever method they prefer. Data for this study were collected using an online questionnaire. An online questionnaire was preferred for this study because it reduces levels of social desirability answering, is enjoyable to participants, produces fewer errors and no incomplete questionnaire may be returned, as all the items in the questionnaire can be marked "required" (Nayak & Narayan, 2019). In addition, an online questionnaire is suitable for collecting data in a cross-sectional study (Nayak & Narayan, 2019). Singh and Sagar (2021) posit that online questionnaires became the preferred method of data collection during the Covid-19 pandemic by guaranteeing the safety of researchers and respondents from contracting the virus. Moreover, questionnaires are divided into two categories, depending on how they are administered: self-administered and interviewer administered (Ragab & Arisha, 2018).

Self-administered questionnaires are questionnaires that have been prepared expressly for respondents to complete without the involvement of the researcher (Lavrakas, 2008). In contrast, interviewer-administered questionnaires involve the researcher recording data based on respondents' responses collected over the phone or in person (Ragab & Arisha, 2018). The online questionnaire for this study was self-

administered, allowing the respondents to complete the questionnaire at a convenient time for them and in the absence of the researcher to reduce bias. Nardi (2018) holds the view that a self-administered questionnaire is suitable for examining non-observable attitudes and opinions, measuring variables with answer options or multiple values that would be difficult to read in an interview, describing demographics of a large population, and studying behaviours that are hard to identify face to face. Furthermore, a self-administered questionnaire encourages respondents to be open and honest in their responses (Ongena & Dijkstra, 2021). Jenn (2006) emphasises that a self-administered questionnaire must have extremely clear instructions and questions, and be well designed and organised logically. Babbie (2020) postulates that a poorly designed self-administered questionnaire might cause respondents to misunderstand questions, be confused about the nature of the data sought, or even discard the questionnaire. The following section describes the design and layout of the self-administered online questionnaire used to gather data for this study.

#### 4.7.1 The design and structure of the online questionnaire

The online questionnaire was designed and administered using Google Forms. Google Forms is a survey administration tool that forms part of Google's free, web-based Google Docs Editors package. It was selected because it is simple to use, free and automatically gathers responses in a Google spreadsheet, thereby making the analysis of data simpler (Vasanth & Harinarayana, 2016). Nayak and Narayan (2019) state that Google Forms is ideal for administering short questionnaires, graphing the results or downloading the results into a spreadsheet for further analysis. In addition, questionnaires created on Google Forms are compatible on both desktop and mobile web browsers (Wildgoose & Bakrania, 2017). Moreover, the online questionnaire was developed in such a way that it could be completed anonymously. An anonymous questionnaire was preferred for the current study to ensure the anonymity of respondents and to encourage them to provide candid and accurate responses to the questionnaire questions, as recommended by Li and Van den Noortgate (2019). The anonymous online questionnaire used to collect data for this study included a cover letter and was divided into two sections: Section A and Section B. The questionnaire is attached in Appendix A. The subsequent sub-sections describe the structure of the anonymous online questionnaire.

#### *4.7.1.1 Cover letter of the online questionnaire*

Lavrakas (2008) asserts that the main goal of a cover letter is to notify the respondents about the questionnaire it is accompanying and to offer information about the research. The cover letter for the online questionnaire used in this study included the following: the description of the research, the aim of the research, the reason why the respondent was selected, the approximate time required to complete the questionnaire and ethical assurances. The cover letter concluded with a 'consent item' for respondents to give consent by choosing either "I agree to participate" or "I do not want to participate". If respondents chose to participate, they were granted access to the questionnaire. However, if they declined, a thank you message appeared and they were logged out.

#### *4.7.1.2 Section A of the online questionnaire*

Section A of the online questionnaire was designed to gather information about the respondents' demographics. Demographics are characteristics that give specific information on respondents in a research study (Huff & Tingley, 2015). Demographic data give information on research respondents and are required to determine whether the respondents are a representative sample of the target population (Salkind, 2010). Therefore, Section A of the questionnaire collected demographic data related to the respondents' gender, age, experience with using WhatsApp for ERT and educational qualification. The demographic questions were measured using a nominal scale. A nominal scale is a measuring system that is used to categorise occurrences or things into distinct groups (Salkind, 2010). The inclusion of the demographic questions enables the researcher to gain background information about the respondents (Allen, 2017). In addition, demographics assist researchers and readers to understand to whom the research results apply and to make comparisons across study replications (Hammer, 2011). Furthermore, demographics allow the researcher to describe the respondents and better analyse data (Allen, 2017).

#### *4.7.1.3 Section B of the online questionnaire*

Section B of the online questionnaire consisted of 44 items measuring the 11 constructs of the extended UTAUT2, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention. Each construct comprised four items adapted from previous

studies (see Appendix B). However, the items were modified to suit the context of the present study. Adapting the items from previous studies was the first step towards ensuring the validity and reliability of the measurement items. The items from previous UTAUT2 (Azizi et al., 2020; Venkatesh et al., 2012), teaching value (Ain et al., 2015), attitude towards use (Davis et al., 1989), personal innovativeness (Agarwal & Prasad, 1998) and self-efficacy (Compeau & Higgins, 1995) studies have been reported as having excellent reliability and validity for assessing the desired constructs.

The 44 items measuring the 11 constructs of the extended UTAUT2 were measured on a five-point Likert scale ranging from “Strongly disagree” to “Strongly agree”, as recommended by Chong et al. (2017). The five-point Likert scale is a form of psychometric response scale in which respondents rate their agreement with a statement on a scale of five points (Preedy & Watson, 2010). Likert-scale questionnaires have several advantages, including the ability to quickly collect data from a large number of respondents and providing highly reliable estimates of individual ability, establishing the validity of interpretations based on the data they provide, and comparing, contrasting and combining the data they provide with other data collection techniques (Nemoto & Beglar, 2014). Moreover, the selection of a five-point Likert scale is justifiable because most previous studies adapting the UTAUT2 questionnaire have used it (Azizi et al., 2020; Meet et al., 2022; Nguyen & Nguyen, 2021; Nikolopoulou et al., 2020). In addition, the Likert scale allowed the researcher to quantify the respondents’ responses.

#### 4.7.2 Dissemination of the online questionnaire

The online questionnaire was disseminated to a convenience sample of secondary school teachers through WhatsApp and e-mail. The researcher approached teachers at the selected schools and, after having explained the aim and objectives of the study, asked them to participate in the study. Those willing to participate were requested to provide the researcher with their e-mail addresses and WhatsApp numbers to send the link to the questionnaire. The researcher also shared an invitation to complete the questionnaire, along with the link to the questionnaire, with each school principal to post on existing staff (teacher) WhatsApp groups. Teachers who were interested in participating would click on the link to complete the questionnaire. The online questionnaire for the pilot study was made available for completion for three days,

starting from 1 August 2022 to 3 August 2022 (see section 4.10). However, the online questionnaire for the main study was made available for completion for four weeks, starting from 8 August 2022 to 2 September 2022.

#### 4.7.3 Time horizon

The time horizon represents the time frame for research (Melnikovas, 2018). Saunders et al. (2019) categorised the time horizon into cross-sectional and longitudinal studies. A Cross-sectional study involves collecting data at a single moment in time, while a longitudinal study involves collecting data repeatedly over a long period for the purpose of comparison (Melnikovas, 2018). A survey study may also be administered at one point in time or conducted over a period (Asenahabi, 2019; Creswell & Hirose, 2019). Therefore, data for this study were collected at one point in time, thereby making the study cross-sectional. A cross-sectional survey study was selected for this study because it is inexpensive and quicker to conduct than a longitudinal survey study (Connelly, 2016).

### 4.8 DATA ANALYSIS

Data analysis is the most essential phase of the research process (Supra, 2022). It is the act of sorting, classifying, altering and summarising gathered data to find answers to research questions (Supra, 2022). It also entails synthesising the collected data using analytical and logical reasoning to discover patterns and trends (Supra, 2022). Creswell (2015) states that data analysis entails explaining and interpreting the data collected through an online questionnaire. It is worth mentioning that before data analysis was performed in this study, the respondents' responses captured in Google Forms underwent the process of data coding. Firstly, the responses captured in Google Forms were downloaded into a Microsoft Excel spreadsheet. Secondly, the responses were coded numerically on the Excel spreadsheet. Lastly, the Excel spreadsheet was imported into the SPSS and AMOS software versions 28 to perform descriptive statistical analysis and structural equation modelling (SEM) analysis, respectively. Descriptive and SEM analyses were selected for this study because research located within the positivism paradigm typically employs these two statistical approaches to analyse data (Ryan, 2018). The descriptive and SEM analyses performed in this study are described in detail in the sections that follow.

#### 4.8.1 Descriptive statistical analyses



Descriptive statistics are a statistical technique used to summarise and display data in a comprehensible way so that the sample may be understood (Mishra et al., 2019). Furthermore, descriptive statistics are used to provide summaries that are specific to the sample group rather than the target population (Mishra et al., 2019). In this study, descriptive statistics were performed to describe and summarise the collected data using frequency tables and graphs. The descriptive statistics were generated using SPSS version 28. SPSS was chosen because it can easily generate all forms of descriptive statistical analysis within a short period (Gogoi, 2020).

#### 4.8.2 Structural equation modelling analysis

SEM is a collection of statistical procedures used to assess and evaluate the correlations between variables (Beran & Violato, 2010; Civelek, 2018a). It is a combination of confirmatory factor analysis (CFA) factor, path and regression analyses conducted simultaneously (Amalia et al., 2021). In addition, SEM enables researchers to simultaneously estimate a complex model that includes multiple dependent and independent variables (Dash & Paul, 2021; Hair et al., 2021). There are two SEM techniques that researchers may choose from: CB-SEM and partial least squares structural equation modelling (PLS-SEM). It is critical for researchers to understand the distinctions between the two SEM techniques in order to choose the one that is most suitable for their research. CB-SEM is primarily used to confirm an established theory and its underlying hypotheses (Hair & Alamer, 2022). In contrast, PLS-SEM is used to predict and develop a theory (Hair & Alamer, 2022). Therefore, for this study, the CB-SEM method was chosen and conducted using AMOS version 28. AMOS was chosen to perform CB-SEM because it is based on covariance (Dash & Paul, 2021) and is user-friendly (Collier, 2020).

Moreover, the CB-SEM method was considered suitable for the present study, as the focus of the study was to extend the already established UTAUT2 with additional constructs and test the hypothesised relationships. Furthermore, CB-SEM is a more powerful and reliable SEM method for establishing the model fit of the structural model than PLS-SEM (Civelek, 2018b). In this study, the CB-SEM analysis was performed using the two-step approach developed by Anderson and Gerbing (1988). Firstly, the measurement model was evaluated to establish construct validity using CFA.

Secondly, the structural model was assessed to test the stated hypotheses and evaluate the model's explanatory power.

#### **4.9 VALIDITY AND RELIABILITY**

The significance of assessing the validity and reliability of a measuring instrument has been well documented in the literature (Farghaly, 2018; Mohajan, 2017). Sürücü and Maslakçi (2020) assert that the validity and reliability of a measurement instrument are two indispensable aspects that allow a study to produce favourable results. This implies that the online questionnaire used to gather data for this study had to have both validity and reliability for this study to provide useful results. For this reason, the researcher employed various methods to ensure the validity and reliability of the online questionnaire. The following sub-sections provide detailed explanations of the methods used to evaluate the validity and reliability of the online questionnaire used to collect data for this study.

##### **4.9.1 Validity**

Validity relates to the extent to which an instrument accurately measures what it purports to measure (Heale & Twycross, 2015; Oktavia et al., 2018). In this study, validity represents how accurate the online questionnaire measured what it was intended to measure. A questionnaire that has low or poor validity implies that some of the items in the questionnaire do not measure what the questionnaire purports to measure (Oktavia et al., 2018). Several types of validity should be considered when validating a questionnaire, including face, content and construct validity (Oktavia et al., 2018). The online questionnaire used in this study was subjected to three validity tests as recommended by Oktavia et al. (2018), namely face, content and construct validity, to ensure that the conclusions drawn from the results of the online questionnaire were valid.

##### **4.9.1.1 Face validity**

Face validity is the subjective evaluation of whether a questionnaire appears to assess what it is supposed to measure (Trockel et al., 2018). It involves the assessment of the questionnaire's appearance in terms of style and formatting uniformity, readability, feasibility and language clarity (Taherdoost, 2016b). In this study, the face validity of the online questionnaire was established in three stages. Firstly, the researcher

subjectively judged the presentation and relevance of the online questionnaire and concluded that the items in the questionnaire were unambiguous (see Aithal & Aithal, 2020). Secondly, the research supervisor reviewed the online questionnaire and concluded that the items in the questionnaire measured what they intended to measure on face value (see Oktavia et al. (2018)). Thirdly, face validity was conducted during the pilot testing of the online questionnaire to determine how easily the respondents understood the items in the questionnaire (see Aithal & Aithal, 2020). Oktavia et al. (2018) explain that a questionnaire has face validity if its items are relevant and clear to the respondents completing the questionnaire. In this study, all the items of the online questionnaire were found to be relevant and unambiguous by the respondents (see section 4.11).

#### *4.9.1.2 Content validity*

Content validity denotes the extent to which the items in a questionnaire assess the breadth of the theoretical construct they intend to measure (Trochel et al., 2018). In this study, content validity involved examining the items of the online questionnaire and agreeing that they fully reflect the constructs of the proposed extension of the UTAUT2. This was achieved by adapting previously validated UTAUT2 questionnaires (Abbad, 2021; Azizi et al., 2020; Chao, 2019; Skoumpopoulou et al., 2018; Venkatesh et al., 2012) and other questionnaires incorporating the constructs of learning value (Ain et al., 2015; Dajani & Hegleh, 2019; Prasetyo et al., 2021), attitude towards use (Camilleri & Camilleri, 2019; Davis et al., 1989), personal innovativeness (Agarwal & Prasad, 1998; Dajani & Hegleh, 2019; Mokhtar et al., 2018) and self-efficacy (Compeau & Higgins, 1995; Mokhtar et al., 2018; Zhao et al., 2020). These previous questionnaires were however modified to suit the context of using WhatsApp for ERT. Furthermore, the content validity of the items in the online questionnaire was assessed by the research supervisor.

Although it is recommended to involve multiple experts on the problem being studied to assess content validity, the use of one expert was justifiable in this study. Firstly, five experts were initially identified, but due to their commitments and responsibilities, they later pulled out, so due to time and budget constraints, it was suggested to use the research supervisor. Secondly, the research supervisor has a high level of expertise and experience in the field of this study. Therefore, the research supervisor's

in-depth understanding of the field of the study enabled her to make an insightful judgment with regards to the relevance and accuracy of the items measuring the constructs. Finally, the current study used a validated pre-existing UTAUT2 questionnaire and other questionnaires that included the constructs of attitude towards use, learning value, personal innovativeness and self-efficacy but slightly modified them to suit the context of the study.

#### *4.9.1.3 Construct validity*

Construct validity is the extent to which a questionnaire assesses the characteristic or theoretical construct that it is designed to assess (Sürücü & Maslakçi, 2020). It is the most crucial method of assessing a questionnaire meant to evaluate constructs that are not observable (Tsang et al., 2017). Aithal and Aithal (2020) hold the view that if the constructs in a questionnaire are not validated, it will be difficult to analyse and interpret the results as well as make inferences from the results. The construct validity of a questionnaire is usually measured by the assessment of convergent and discriminant validity (Aithal & Aithal, 2020; Faqih & Jaradat, 2021). For this reason, the online questionnaire used in this study was subjected to convergent and discriminant validity to achieve construct validity.

##### *4.9.1.3.1 Convergent validity*

Convergent validity denotes the extent to which the constructs being measured are theoretically correlated (Sürücü & Maslakçi, 2020). In other words, it is the degree to which constructs that should be theoretically related are actually related. Fornell and Larcker (1981) propose three criteria for evaluating convergent validity, namely computing the (1) factor loadings of the items, (2) composite reliability and (3) AVE of the constructs. Factor loadings are “correlation coefficients between observed variables and latent common factors” (Naushad, 2021, p. 231). They show the proportion of variation explained by a variable on a certain factor (Naushad, 2021). Composite reliability measures the internal consistency of a set of items that reflect the latent construct (Chen & Shen, 2015). AVE measures the amount of variance represented by a construct in relation to the variation attributable to measurement error (Dos Santos & Cirillo, 2021). According to Fornell and Larcker (1981), convergent validity is achieved when the factor loadings are greater than 0.50, the composite reliability value is 0.70 or higher, and the AVE value exceeds 0.5. Therefore, all three

criteria for evaluating convergent validity as recommended by Fornell and Larcker (1981) were used to establish the convergent validity of the online questionnaire used in the current study.

#### *4.9.1.3.2 Discriminant validity*

Discriminant validity, also known as ‘divergent validity’, examines whether constructs that should not be related are in fact not related (Taherdoost, 2016b). In other words, it assesses the degree to which a construct is distinct from other closely related constructs. Fornell and Larcker (1981) state that discriminant validity is demonstrated when the square root of AVE for each construct is higher than the construct’s correlation with other constructs. Therefore, the current study established discriminant validity by comparing the square root of the AVE for each construct incorporated in the proposed extension of the UTAUT2 and the correlation between the construct and other constructs.

#### 4.9.2 Reliability

Reliability is concerned with the consistency or repeatability of a measuring instrument (Ehizele & Azodo, 2013). It is the degree to which a questionnaire delivers consistent results across time under the same conditions (Ehizele & Azodo, 2013; Bolarinwa, 2015; Tsang et al., 2017). In a nutshell, a questionnaire is considered reliable if it consistently produces the same results when administered to the same group of respondents. The reliability of a questionnaire can be determined using different methods, including test-retest, alternate form and internal consistency (Aithal & Aithal, 2020). Test-retest reliability is concerned with the consistency of the results produced when the questionnaire is administered to the same respondents at multiple occasions (Sürücü & Maslakçi, 2020). Alternate form reliability is demonstrated when two distinct questionnaires measuring the same constructs are administered to respondents at the same time (Bolarinwa, 2015). The results are then compared using Pearson statistics or t-test statistics to estimate the reliability coefficient (Sürücü & Maslakçi, 2020). Internal consistency reliability measures the homogeneity of the items in a questionnaire (Sürücü & Maslakçi, 2020). In other words, it measures the intercorrelation of the questionnaire items. Among the three methods of measuring the reliability of a questionnaire, the most widely applied method is internal consistency

reliability, because the questionnaire is administered only once (Bannigan & Watson, 2009; Salkind, 2010).

For this study, the reliability of the online questionnaire was established by measuring its internal consistency. The internal consistency of the online questionnaire was estimated by computing Cronbach's alpha using SPSS. Cronbach's alpha is the most popular measure of internal consistency reliability that quantifies the degree of random measurement error in a total score or average derived from a multi-item measuring scale (Hayes & Coutts, 2020). Its value ranges from 0 to 1. According to Hair et al. (2021), a Cronbach's alpha value greater than 0.9 is considered exceptional, greater than 0.8 is good, greater than 0.7 is acceptable, greater than 0.6 is questionable, and less than 0.5 is substandard for both Cronbach's alpha and composite reliability. Therefore, in this study, a Cronbach's alpha value of 0.70 or higher was considered acceptable internal consistency, as recommended by Hair et al. (2021). In this study, the questionnaire obtained an overall Cronbach's alpha value of 0.882, thereby indicating good internal consistency reliability.

#### **4.10 PILOT STUDY**

A pilot study is described by Arain et al. (2010) as a small-scale feasibility study aimed to evaluate different components of the methods that will be used in a larger study. Baker (1994) describes it as a small-scale trial study designed to pre-test a questionnaire in preparation for the major study. According to Lavrakas (2008), it is critical to perform at least one pilot study before disseminating a questionnaire to a larger sample of the target population to ensure that it is well understood and does not provide blatantly biased results. For this reason, one pilot study was conducted in this study to check the average time it takes to complete the online questionnaire (see Chiwaridzo et al., 2017), to validate the questionnaire (see Ibarra-Barrueta et al., 2019), to verify that all the items in the questionnaire are well understood (see Lavrakas, 2008) and to address any problems that may occur in wording and measurement (see Sekaran & Bougie, 2019).

The pilot study consisted of a convenience sample of 15 respondents from two secondary schools in the Lulekani Circuit who were using WhatsApp for ERT. These respondents were non-participants in the main study. The online questionnaire was administered from 1 to 3 August 2022 in the presence of the researcher. After

completion of the online questionnaire, the respondents were asked to remark on whether they understood all the items in the questionnaire and the provided response options. The pilot study showed that on average, the respondents completed the online questionnaire in approximately 20 minutes. This corresponded with the anticipated completion time. The respondents indicated that they understood all the items of the questionnaire and the provided response options. Therefore, no modifications were made to the items and the response options in the final version of the questionnaire. However, the respondents suggested the inclusion of the definition of ERT in the final questionnaire to facilitate comprehension of the concept. The definition of ERT was therefore included in the final questionnaire.

Furthermore, the pilot study demonstrated that the questionnaire was reliable. This was achieved by examining the internal consistency of the questionnaire by computing Cronbach's alpha values using SPSS. Table 4.1 shows the results of the Cronbach's alpha. As shown in Table 4.1, Cronbach's alpha values for all the constructs ranged from 0.713 to 0.915 and the overall Cronbach's alpha value was 0.944, which was above the recommended cut-off value of 0.70, thereby suggesting exceptional internal consistency reliability (see Hair et al., 2021). Therefore, it may be concluded that the questionnaire achieved internal consistency reliability.

**Table 4.1: Results of Cronbach's alpha**

<b>Construct</b>	<b>Number of items</b>	<b>Cronbach's alpha</b>
Performance expectancy	4	0.851
Effort expectancy	4	0.756
Social influence	4	0.796
Facilitating conditions	4	0.906
Hedonic motivation	4	0.804
Teaching value	4	0.713
Habit	4	0.915
Attitude towards use	4	0.762
Personal innovativeness	4	0.720
Self-efficacy	4	0.763
Behavioural intention	4	0.759

<b>Overall</b>	<b>44</b>	<b>0.944</b>
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#### **4.11 ETHICAL CONSIDERATIONS**

Ethical considerations in research are a collection of guiding principles for designing and conducting research. Bryman (2016) submits that ethical considerations are one of the most crucial aspects of any research and cannot be ignored at any point during the data collection process. Simelane-Mnisi (2018) argues that any scholarly research that involves human subjects must obtain ethical approval from the institutional ethical review committee before conducting the study. In this regard, prior to conducting this research, the researcher applied for and was granted ethical approval by the University of South Africa's College of Education Research Ethics Committee (see Appendix C). Therefore, the present study was strictly conducted in accordance with the ethical guidelines outlined by this committee. In addition to the ethical guidelines outlined by the committee, various ethical principles were considered when conducting this study, including requesting for permission to conduct the research, informed consent and voluntary participation, and confidentiality and anonymity.

##### **4.11.1 Permission to conduct the research.**

After obtaining the ethics certificate, permission to conduct the research was sought and granted by the Limpopo Provincial Research Committee (see Appendix D). This committee reviews all the research proposals for research in the Limpopo provincial departments, including education, and decides whether or not to grant the research proposal permission. Upon being granted permission by the Limpopo Provincial Research Committee, the researcher wrote a letter to the Mopani District Director requesting permission to conduct research in the secondary schools in the Namakgale and Lulekani circuits (see Appendix E). Permission was then granted by the Mopani District Director (see Appendix F). Thereafter, the researcher wrote a letter to the Lulekani Circuit Manager (see Appendix G) and the Namakgale Circuit Manager (see Appendix H) requesting permission to conduct research in the selected secondary schools. Approval to conduct the research was granted by the Namakgale Circuit Manager (see Appendix I) and the Lulekani Circuit Manager (see Appendix J). Thereafter, the researcher wrote letters to the principals of the participating schools, requesting permission to conduct the research in their schools (see Appendix K). All



the participating schools granted the researcher permission to conduct the research (see Appendix L).

#### 4.11.2 Informed consent and voluntary participation

Informed consent and voluntary participation are crucial components of conducting ethical research (Akaranga & Makau, 2016). Informed consent is the process by which research participants voluntarily choose whether or not to participate in research after being informed of the purpose of the research and the potential risks and benefits of participating (Akaranga & Makau, 2016). Therefore, the online questionnaire used to collect data for the present study included a cover letter explaining the purpose of the study, why the respondent was chosen to participate and how the data would be used (see Appendix A). The cover letter also indicated that participation in this study was completely voluntary and that respondents could withdraw at any stage before clicking the send button due to the anonymous nature of the questionnaire. Furthermore, the cover letter ended with a 'consent item' for respondents to give consent by selecting either "I agree to participate" or "I do not want to participate" (see section 4.7.1.1).

#### 4.11.3 Confidentiality and anonymity

Confidentiality and anonymity are further important components of ethical research aimed to preserve respondents' privacy during data gathering, analysis and reporting (Allen, 2017). Fleming and Zegwaard (2018) state that confidentiality and anonymity are essential ethical principles in the protection of respondents against possible harm. Confidentiality is the separation or modification of any personal identifiable information given by the respondents from the data, while anonymity is the practice of gathering data without obtaining any personally identifiable information (Allen, 2017). Therefore, to ensure the confidentiality and anonymity of the respondents, the online questionnaire used in this study did not gather any personal identifiable information and was designed to be completed anonymously. In other words, no personal identifiable information (e.g. name and e-mail address) was collected that could link the respondents personally. Furthermore, the respondents were assured that they would not be named or otherwise identified in the research report, and the identities of the participating schools were also protected.

### **4.12 SUMMARY**

This chapter provided a detailed explanation and justification of the research design and methodology adopted in the current study. The study was located within the positivism paradigm. The positivism paradigm informed the selection of the approach to theory development (deductive), research approach (quantitative), research design (survey), method of data collection (questionnaire) and data analysis procedures (descriptive and SEM analyses) used in this study. The chapter also explicated in detail the study population and the sampling procedure (convenience) used to select a sample. Furthermore, the chapter provided a discussion of the measures used to validate the data collection instrument. Finally, the chapter provided a detailed explanation of the ethical considerations considered in this study, including permission to conduct the research, informed consent and voluntary participation, and confidentiality and anonymity. The next chapter presents the research results and discussion.

## CHAPTER 5

### RESEARCH RESULTS AND DISCUSSION

#### 5.1 INTRODUCTION

The preceding chapter described the research design and methodology adopted in this study. Data for this study were gathered using an anonymous questionnaire designed and developed on Google Forms. The responses captured on Google Forms were downloaded into an Excel spreadsheet and thereafter coded numerically. The coded spreadsheet was then imported into SPSS version 28 and AMOS version 28 to perform statistical analyses. The present chapter focuses on data analysis, presentation and discussion of the research results. De Vos et al. (2002) assert that data analysis enables the investigator to break down the data into multiple component pieces to address the research questions and confirm the stated hypotheses. In contrast, the discussion of the research results allows the researcher to interpret and describe the importance of the results with respect to what was previously known about the phenomenon under investigation, as well as to explain any new knowledge that arose from the study (Annesley, 2010).

Data were analysed to address the main research question and its sub-questions and confirm the hypotheses of the study. The main research question was as follows: What factors influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The research sub-questions were as follows:

1. What is the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit?
2. What is the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?
3. What is the influence of teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

4. Which factor can best predict secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The formulated hypotheses for the study were the following:

**H1:** Performance expectancy influences behavioural intention to accept and use WhatsApp for ERT.

**H2:** Effort expectancy influences behavioural intention to accept and use WhatsApp for ERT.

**H3:** Social influence influences behavioural intention to accept and use WhatsApp for ERT.

**H4:** Facilitating conditions influence behavioural intention to accept and use WhatsApp for ERT.

**H5:** Hedonic motivation influences behavioural intention to accept and use WhatsApp for ERT.

**H6:** Teaching value influences behavioural intention to accept and use WhatsApp for ERT.

**H7:** Habit influences behavioural intention to accept and use WhatsApp for ERT.

**H8:** Attitude towards use influences behavioural intention to accept and use WhatsApp for ERT.

**H9:** Personal innovativeness influences behavioural intention to accept and use WhatsApp for ERT.

**H10:** Self-efficacy influences behavioural intention to accept and use WhatsApp for ERT.

The chapter is divided into eight major sections. It discusses, firstly, the method of examining the data for common method bias; secondly, screening and cleaning of the data; thirdly, the response rate; fourthly, the descriptive statistics of the respondents' responses to the online questionnaire; fifthly, the reliability of the questionnaire; sixthly, the level of acceptance and use of WhatsApp for ERT; seventhly, the sampling adequacy of the data; and finally, the SEM analysis.

## **5.2 EXAMINATION FOR POSSIBLE COMMON METHOD BIAS**

Common method bias usually occurs when the same response method is used to measure both the independent and the dependent variables (Kock et al., 2021). Rodríguez-Ardura and Meseguer-Artola (2020) state that a lengthy self-administered questionnaire employed in cross-sectional research to gather all the data from a sample might be a possible source of common method bias. According to them, this is due to the assumption that self-administered questionnaires involve great cognitive effort to provide truthful responses, and near the end of the questionnaire, respondents may experience exhaustion and be less inclined to provide truthful responses (Rodríguez-Ardura & Meseguer-Artola, 2020). This implies that respondents may be less exhaustive and provide replies that are more consistent. Jordan and Troth (2020) observed that when common method bias exists, wrong conclusions could be made about the reliability and validity of the scales and the paths between constructs.

Therefore, it is crucial to assess the data derived from a self-administered questionnaire for potential common method bias. For this study, the Harman's single-factor test recommended by Podsakoff et al. (2012) was used to evaluate common method bias for all the 44 items measuring the constructs of the extended UTAUT2. According to Harman's single-factor test, common method bias exists if the unrotated solution for all the measured items produces one factor that explains more than 50% of the variation (Podsakoff et al., 2012). In this study, the Harman's single-factor test was computed using SPSS. The result of the Harman's single-factor test demonstrated that a single factor solution accounted for 14.1% of the variance, which is less than the 50% threshold. Therefore, the result showed that the data for the current study were free from common method bias.

### **5.3 DATA SCREENING AND CLEANING**

According to Hair (2021), it is critical to screen and clean the collected quantitative data before performing any analysis to ensure accurate inferences. Data cleaning involves identifying and, if possible, correcting data errors (Huebner et al., 2020). Data screening involves systematically assessing and documenting data properties and data quality that could affect future analyses and interpretation (Huebner et al., 2020). In this study, data screening and cleaning were conducted with the goal of satisfying the requirement of performing CB-SEM analysis. CB-SEM analysis requires that certain fundamental assumptions be fulfilled to provide reliable results (Mohamad et

al., 2019). As a result, in accordance with Hair et al.'s (2021) recommendations, data screening and cleaning in this study included the assessment of unengaged responses, missing data, outliers, multicollinearity and normality.

### 5.3.1 Unengaged responses

Unengaged responses, also known as 'careless responses', refer to suspicious response patterns where respondents choose the same response option for many sets of items (Zabri & Mohammed, 2018). In other words, unengaged responses exist when a respondent selects the same response option for every item, regardless of whether the statement in the item is negative (e.g. 3333, 4444 or 5555). This response pattern shows that such respondent was not engaged while completing the questionnaire. According to Collier (2020), unengaged responses should be deleted from the data set. This is because unengaged responses may overestimate the relationships between related constructs (Huang et al., 2015) and seriously impair the conclusions that can be drawn from survey results (Soland et al., 2019).

For this study, the unengaged responses were assessed by calculating the standard deviation of the responses for each respondent, as recommended by Zabri and Mohammed (2018), using SPSS. A standard deviation measures the degree to which the responses deviate from the mean (Sutanapong & Louangrath, 2015). Zabri and Mohammed (2018) state that a standard deviation of below 0.5 (on a five-point Likert scale) should be considered an unengaged response. In this study, the results of the standard deviation of the responses of all the respondents were between 0.54 and 1.87, thereby indicating that there were no cases of unengaged responses in the data set (see Zabri & Mohammed, 2018).

### 5.3.2 Missing data

Missing data, also referred to as 'missing values' or 'missingness', is the absence of a data value for a variable in an observation of interest (Kang, 2013). It occurs when respondents do not respond to some of the items in the questionnaire (Little & Rubin, 2019). Assessment of the data for missing data is important, as missing data may result in the loss of critical information, increased standard errors, weak statistical power and biased estimates (Dong & Peng, 2013). Usakli and Rasoolimanesh (2023) state that assessment of the data for missing values is crucial when analysing data using the CB-SEM method, as this method is sensitive to missing values.

Kang (2013) observed that in quantitative research studies, missing data is a prevalent issue. In this study, precaution was taken to ensure that the submitted responses did not contain any missing data. All the questions on the online questionnaire were marked “required”, making it impossible for respondents to move on to the next question before answering the present one, as suggested by Binyamin (2019) and Wang (2018). Respondents could, however, exit the questionnaire at any time if they did not wish to continue. In this study, a total of 215 responses were submitted, and there were no missing data in the responses.

### 5.3.3 Outliers

The assessment of the data for outliers is one of the most important steps of quantitative data analysis (Pallant, 2020). Outliers are data points that deviate significantly from the majority of other data points (Leys et al., 2019). Put simply, outliers are data values that are extremely high or low in comparison to other values of the same construct. It is important to identify and manage outliers prior to data analysis, as their presence may affect the normality and validity of the data (Hair et al., 2019), jeopardise the fit indices of the structural model (Aguinis et al., 2013; Kline, 2016) and result in the erroneous acceptance or rejection of hypotheses (Bollen & Jackman, 1990). According to Ritter and Gallegos (1997), it is uncommon not to have outliers in real data. This is because outliers are caused by various factors, including sampling error, confusing or poorly worded items in the questionnaire, erroneous data entry, the absence of a code for missing data and a legitimate extreme value (Mowbray et al., 2019). Exactly how to deal with outliers is an ongoing discussion that is heavily influenced by why they existed in the first place (Khan, 2017).

Leys et al. (2019) opine that once outliers are detected in the dataset, researchers need to decide whether or not to keep, remove or recode them. Khan (2017) says that researchers need to rely on their experience, training, and judgement when deciding whether or not to keep, remove or recode the outliers. There are two types of outliers that are important to detect: univariate and multivariate outliers (Verardi & Vermandele (2018). Tabachnick and Fidell (2021) describe univariate outliers as data points that have an extraordinary value for a single variable and deviate from the expected population values. According to them, univariate outliers can be detected using various techniques, including standard score (z-score) analysis, interquartile range, boxplots

and histograms (Tabachnick & Fidell, 2021). For this study, the detection of univariate outliers in the dataset was done using z-score analysis recommended by Anusha et al. (2019). The selection of z-score analysis over the other univariate outlier detection techniques is justified because z-score analysis is the fastest, most robust and most objective way of identifying univariate outliers (Anusha et al., 2019). In addition, z-score analysis is the most widely employed technique for detecting univariate outliers (Mowbray et al., 2019). A z-score is a standardised score assigned to a continuous variable that indicates whether an observation is below or above the mean (Allen, 2017). In this study, the z-score analysis was done on all the variables using SPSS. According to Tabachnick and Fidell (2013), a z-score of less than -3.29 or more than +3.29 indicates that univariate outlier exists. After careful inspection of the results of the z-score analysis, only four cases (81, 55, 41 and 22) of univariate outliers were detected with z-scores of 3.65 on the variable of highest educational qualification, as shown in Table 5.1. Therefore, in this study, a decision was made to retain the univariate outliers, as they were not surprising, were not caused by data entry errors and belonged to the target population (Kline, 2016). In addition, the identified univariate outliers hold useful demographic information.

**Table 5.1: Univariate outliers**

Case ID	Highest educational qualification	Z-score
81	Master's degree	3.65
55	Master's degree	3.65
41	Master's degree	3.65
22	Master's degree	3.65

Another type of outlier that was detected in this study were multivariate outliers, which describe a combination of unusual scores on several constructs (Leys et al., 2019). In this study, multivariate outliers were detected using the Mahalanobis distance ( $D^2$ ) method, as suggested by Tabachnick and Fidell (2021). The Mahalanobis distance is the most effective and commonly used method for detecting multivariate outliers (Ghorbani, 2019; Liu et al., 2018). It measures the distance between data points for the purpose of detecting extreme values that are far from the mean of a distribution (Morchid, 2019). For this study, Mahalanobis distance was computed using SPSS for



all 44 independent variables. Thereafter, using SPSS, the obtained Mahalanobis distance values were compared to a chi-squared distribution with the same degrees of freedom, which was 44 in this research, to generate probability values (p-values). Therefore, all cases with p-values less than 0.001 ( $p < 0.001$ ) were considered multivariate outliers, as suggested by Morchid (2019).

In this study, only 15 cases were classified as multivariate outliers with  $p < 0.001$ , as demonstrated in Table 5.2. Kline (2016) suggests that multivariate outliers may be kept until it is demonstrated that they do not represent any observations in the dataset. Denis (2018) contends that deleting multivariate outliers would be dishonest data analysis unless the researcher can justify that such outliers could not have been expected to occur from the population. Therefore, following the suggestions by Denis (2019) and Kline (2016) and after scrutinising the identified multivariate outliers, it was decided to retain all of them. Furthermore, with a large sample ( $N > 80$ ), as in this research, it is anticipated to have some multivariate outliers that have little impact on the findings (see Parke, 2013).

**Table 5.2: Multivariate outliers**

Case ID	Mahalanobis D <sup>2</sup>	p-value
69	89.74209	0.00
57	87.83718	0.00
209	86.52111	0.00
208	86.11674	0.00
140	83.52984	0.00
149	81.96712	0.00
178	81.79020	0.00
15	80.97335	0.00
30	80.80881	0.00
17	78.81608	0.00
113	77.06160	0.00

65	75.68538	0.00
77	75.53376	0.00
44	74.88820	0.00
93	71.98970	0.00

### 5.3.4 Multicollinearity

Multicollinearity can be described as a high level of linear correlations between the independent variables (Kim, 2019). According to Hair et al. (2018), the presence of multicollinearity may distort or make the regression estimates unstable. Therefore, it is crucial for researchers to be aware of the influence of multicollinearity in the interpretation of the regression estimates (Hair et al., 2018). Consequently, the data for this study were examined for potential multicollinearity issues using SPSS.

The present study assessed multicollinearity by calculating the tolerance and variance inflation factor (VIF) values of the independent variables of the extended UTAUT2, as recommended by Hair et al. (2018). Tolerance refers to the amount of variance of the independent variable explained by other independent variables, while VIF is the inverse of tolerance (Kim, 2019). According to Hair et al. (2018), multicollinearity exists if the tolerance value is less than 0.1 and the VIF value is greater than 5. Table 5.3 shows the results of the tolerance and VIF tests.

**Table 5.3: Multicollinearity test results**

<b>Independent variable</b>	<b>Tolerance</b>	<b>VIF</b>
Performance expectancy	0.910	1.099
Effort expectancy	0.952	1.050
Social influence	0.890	1.124
Facilitating conditions	0.911	1.098
Hedonic motivation	0.815	1.227
Teaching value	0.927	1.078
Habit	0.855	1.169
Attitude towards use	0.910	1.099

Personal innovativeness	0.894	1.119
Self-efficacy	0.894	1.118

*Note: Dependent variable = behavioural intention*

It can be observed from Table 5.3 that the tolerance values for all the independent variables ranged from 0.815 to 0.927, above the recommended benchmark of 0.1, and the VIF values ranged from 1.050 to 1.227, lower than the cut-off value of 5. Therefore, these results indicate that there was no multicollinearity between the independent variables.

### 5.3.5 Normality

Normality is described by Field (2013) as the data distribution for a single variable. An evaluation of the data for normality is a preliminary requirement for determining whether the gathered data are suitable for CB-SEM analysis. Cardella et al. (2021) state that CB-SEM is a parametric statistical method that requires normally distributed data. Civelek (2018a) claims that non-normally distributed data may compromise the validity and reliability of CB-SEM results. Hair and Alamer (2022) state that using CB-SEM with non-normally distributed data may inflate the parameters of the model. Mishra et al. (2019) name two primary approaches for determining the normality of the data: graphical and statistical. Assessment of normality using graphical procedures involves the use of graphs such as histograms, quantile-quantile plots, probability-probability plots, boxplots and stem-and-leaf plots to depict the shape of the data distribution (Ghasemi & Zahediasl, 2012), while the examination for normality of the data using statistical procedures involves the use of various normality tests such as the Shapiro–Wilk test, the Kolmogorov–Smirnov test, and skewness and kurtosis tests (Mishra et al., 2019).

Assessment of the data for normality using various statistical approaches often produces different results, with some normality tests rejecting the null hypothesis of normality, while others do not (Siraj-Ud-Doulah, 2019). Therefore, it is crucial for researchers to give considerable attention to the choice of the statistical procedure to be used to test the data for normality. Siraj-Ud-Doulah (2019) advises researchers to select the most robust and suitable test of normality. For this study, the assessment of the normality of the data was done using statistical procedures using the skewness and kurtosis tests. The skewness and kurtosis tests of normality were selected for the

following reasons: (1) They are the most widely used normality tests (Wijekularathna et al., 2020); (2) they are powerful and robust in small ( $n < 300$ ) samples (Ankarali et al., 2009); and (3) it is simpler to demonstrate normality of the data using the skewness and kurtosis values (Orcan, 2020).

Skewness measures the symmetry, or lack thereof, of a distribution (Bono et al., 2019). Its value can be negative, zero or positive. According to Kline (2016), a negative skewness value shows a left-skewed distribution, and a positive skewness value shows a right-skewed distribution. A zero-skewness value indicates that the distribution is symmetrical, with comparable distributions of data on the left and right sides of the peak (Kline, 2016). Kurtosis measures the tailedness of a distribution (Bono et al., 2019). Tailedness is the frequency with which outliers occur (Turney, 2022). As with the skewness values, kurtosis values can also be negative, zero or positive. Turney (2022) explains that a negative kurtosis value suggests that the distribution is thin-tailed, indicating that outliers are uncommon. A positive kurtosis value means that the distribution is fat-tailed, implying that outliers are common (Turney, 2022). In addition, a zero-kurtosis value shows that the distribution is medium-tailed, meaning that outliers are neither common nor uncommon (Turney, 2022). Although there is controversy surrounding the acceptable threshold of skewness and kurtosis values (Bono et al., 2019), Kline (2016) suggests that a skewness value greater than 3 and a kurtosis value greater than 8 indicate that the data are not normally distributed.

In this study, the skewness and kurtosis values were computed using SPSS. Table 5.4 displays the results of the skewness and kurtosis tests for each construct. As displayed in Table 5.4, the skewness values for all the constructs ranged from -0.0848 to -2.148, and the kurtosis values ranged from 0.025 to 6.138, suggesting that the data were normally distributed (Kline, 2016).

**Table 5.4: Results of skewness and kurtosis tests**

Construct	Skewness		Kurtosis	
	Statistic	Standard error	Statistic	Standard error
Performance expectancy	-0.848	0.66	0.278	0.330
Effort expectancy	-0.967	0.66	0.025	0.330
Social influence	-1.057	0.66	0.164	0.330
Facilitating conditions	-1.092	0.66	0.671	0.330
Hedonic motivation	-1.459	0.66	2.542	0.330
Teaching value	-1.195	0.66	0.721	0.330
Habit	-1.278	0.66	1.708	0.330
Attitude towards use	-1.648	0.66	3.296	0.330
Personal innovativeness	-1.374	0.66	1.724	0.330
Self-efficacy	-1.220	0.66	1.304	0.330
Behavioural intention	-2.148	0.66	6.138	0.330

**5.4 RESPONSE RATE**

A response rate in survey research describes the percentage of participants who responded to a survey questionnaire as a percentage of the total number of questionnaires sent (Fowler, 2013). Booker et al. (2021) argue that it is crucial for a researcher to clearly describe the denominator used to calculate a response rate so that readers may evaluate possible bias, especially when it comes to reasons for non-response. For this reason, a response rate in the context of this study can be described as the number of secondary school teachers who completed the online questionnaire divided by the number of secondary school teachers in the Namakgale Circuit. Although there is no set threshold for what is considered a high response rate (Booker et al., 2021), a rate of 60% or greater is regarded as acceptable (Johnson & Wislar, 2012).

In this study, an online anonymous questionnaire designed on Google Forms was disseminated by WhatsApp and e-mail to 248 teachers from all seven secondary schools in the Namakgale Circuit. A total of 215 responses were recorded on Google

Forms, yielding an 87.9% response rate. After data screening and cleaning, all 215 responses were considered valid for statistical analyses, as no responses were discarded. Consequently, this response rate was deemed adequately representative of the target population (Johnson & Wislar, 2012). Furthermore, a sample size of 200 or more is sufficient for factor analysis (DeVellis, 2017) and complex models (Kline, 2016). The 87.9% response rate was made possible by the researcher's ongoing follow-up with the respondents in the form of reminders given in person and through WhatsApp. Blumenberg et al. (2019) corroborate that the researcher's frequent follow-ups and reminders help boost a response rate. Furthermore, the respondents in this study seemed interested in the research topic and the results, hence the high response rate. In a study investigating the factors influencing web-based survey response rates in educational research, Saleh and Bista (2017) found that participants' interest in the research topic highly influenced the survey's response rate. Other factors that may have positively influenced the response rate for this research were the length of the online questionnaire (see Wu et al., 2022) and the assurance of anonymity and confidentiality (see Saleh & Bista, 2017).

## **5.5 DESCRIPTIVE STATISTICS**

This section presents the descriptive statistics of the respondents' responses to the online questionnaire. Firstly, the section presents the descriptive statistics of Section A of the online questionnaire, which gathered information about the respondents' demographics. Next, the section provides the descriptive statistics of Section B of the online questionnaire, which consisted of items measuring the constructs of the extended UTAUT2.

### **5.5.1 Demographical information of the respondents**

This section provides an overview of the demographical data of the respondents who responded to the online questionnaire. The online questionnaire was designed to collect demographic information such as the respondents' gender, age, experience with using WhatsApp for ERT and highest educational qualification. The following subsections present the descriptive statistics on the demographics of the respondents using frequency tables and figures.

#### **5.5.1.1 Gender**

The data analysis on gender showed that both female and male secondary school teachers participated in the study. Table 5.5 below presents the gender distribution of the respondents. The results showed that out of the 215 respondents, 121 (56.3%) were female and 94 (43.7%) were male. Therefore, it can be concluded that a fair distribution of both male and female secondary school teachers participated in this research.

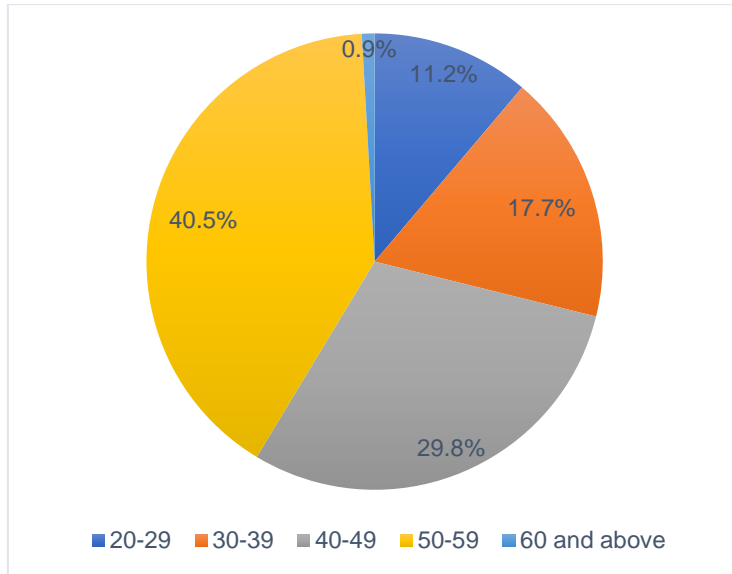
**Table 5.5: Gender distribution of respondents**

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Female	121	56.3
Male	94	43.7
<b>Total</b>	<b>215</b>	<b>100.0</b>

The results from the gender analysis are perhaps understandable, because in South Africa, female teachers dominate the teaching force in public schools (Davids & Waghid, 2020). Therefore, it can be concluded that a fair distribution of both male and female secondary school teachers participated in this research. The result of this study is comparable to the result of a study conducted by De Jager et al. (2017) in South Africa, who reported that a balanced distribution of secondary school teachers participated in their study, comprising 214 (50.5%) women and 210 (49.5%) men.

#### 5.5.1.2 Age

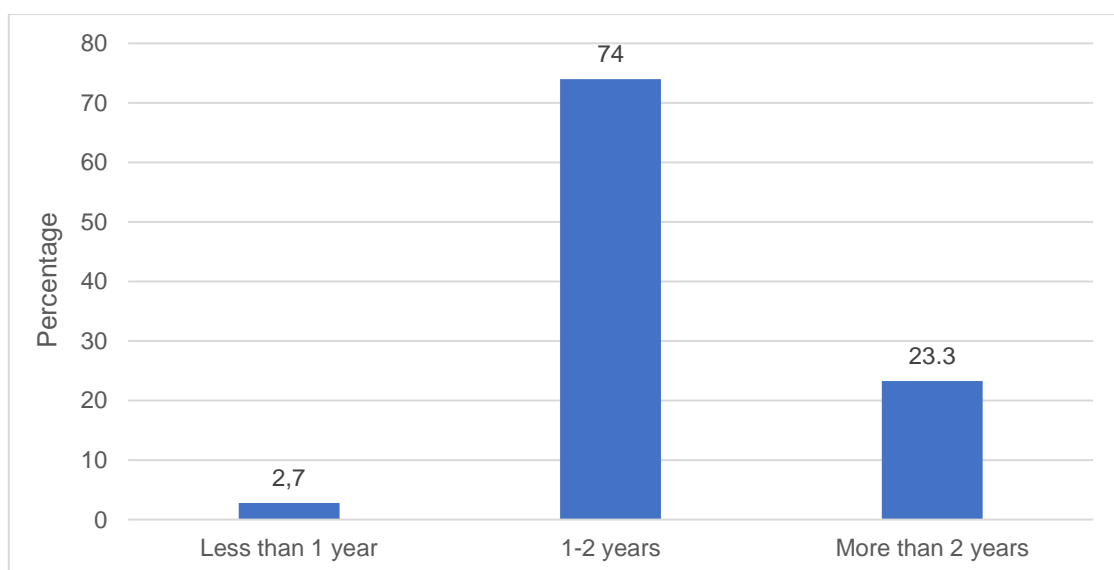
Figure 5.1 shows the age distribution of the respondents according to five age groups. The results illustrate that the age group of 50–59 was predominant (40.5%), while the age groups of 20–29, 30–39, 40–49, and 60 and above represented only 11.2%, 17.7%, 29.8% and 0.9%, respectively. The reason for the high response rate from teachers in the age group of 50–59 may be because almost half (49%) of the public school teachers in South Africa are currently in their 50s (Gustafsson, 2022). The results of this study are similar to the results of a study conducted by Graham et al. (2020) in South Africa, who observed the highest response rate from secondary teachers in the age group of 50–59.



**Figure 5.1: Age distribution of respondents**

#### 5.5.1.3 Experience with using WhatsApp for ERT

The respondents' experience with using WhatsApp for ERT is displayed in Figure 5.2. The results show that the majority of the respondents (74%) had been using WhatsApp for ERT for one to two years. This is followed by 23.3% of the respondents who had been using WhatsApp for ERT for less than a year and 2.7% of respondents who had been using WhatsApp for ERT for more than two years. Therefore, it could be concluded that majority of the respondents had some experience with using WhatsApp for ERT.



**Figure 5.2: Respondents' experience with using WhatsApp for ERT**



#### 5.5.1.4 Highest educational qualification

The respondents' highest educational qualification is presented in Table 5.6. The results show that the majority (77.7%) of the respondents held a bachelor's degree, while 3.2%, 17.2% and 1.9% held diplomas and honours and master's degrees, respectively. Interestingly, no doctoral degree holders were present in the sample. The fact that most of the respondents of this study held a bachelor's degree is understandable, considering that most teachers in South Africa hold a bachelor's degree or an equivalent qualification (Long & Wendt, 2019; Mullis et al., 2017).

**Table 5.6: Respondents' highest educational qualification**

<b>Qualification</b>	<b>Frequency</b>	<b>Percentage</b>
Diploma	7	3.2
Bachelor's degree	167	77.7
Honours degree	37	17.2
Master's degree	4	1.9
<b>Total</b>	<b>215</b>	<b>100.0</b>

#### 5.5.2 Descriptive statistics of the constructs of the extended UTAUT2

This section presents the descriptive statistics of the items of the 11 constructs of the extended UTAUT2, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention. All the items were measured on a five-point Likert scale, where 1 represented "Strongly disagree", 2 represented "Disagree", 3 represented "Neither agree nor disagree", 4 represented "Agree", and 5 represented "Strongly agree". In this study, the "Strongly disagree" and "Disagree" responses were combined and interpreted as respondents valuing the statements as negative. The "Agree" and "Strongly agree" responses were also categorised together and interpreted as respondents valuing the statements as positive. The "Neither agree nor disagree" responses were left as they are.

##### 5.5.2.1 Performance expectancy

Performance expectancy consisted of four items that measured the degree to which secondary school teachers believed that using WhatsApp for ERT would benefit them. Table 5.7 displays the frequency distribution of the performance expectancy items.

**Table 5.7: Frequency distribution of performance expectancy items**

Performance expectancy (PE) [N (%)]					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
PE1: I find WhatsApp useful for emergency remote teaching.	27 (12.5)	23 (10.7)	27 (12.6)	75 (34.9)	63 (29.3)
PE2: Using WhatsApp for emergency remote teaching enables me to accomplish teaching tasks more quickly.	25 (11.6)	27 (12.6)	30 (14)	74 (34.4)	59 (27.4)
PE3: Using WhatsApp for emergency remote teaching promotes my teaching goals.	25 (11.6)	24 (11.2)	30 (14)	65 (30.2)	71 (33)
PE4: Using WhatsApp for emergency remote teaching increases my teaching productivity.	26 (12)	24 (11.2)	30 (14)	64 (29.8)	71 (33)

As Table 5.7 displays, for Item PE1, the majority of the respondents (138; 64.2%) agreed and strongly agreed that WhatsApp was useful for ERT. Almost a quarter (50; 23.2%) disagreed and strongly disagreed, whereas 27 (12.6%) were neutral about it. In response to Item PE2, a high proportion of respondents (133; 61.8%) agreed and strongly agreed that using WhatsApp for ERT enabled them to accomplish teaching tasks more quickly. Almost a quarter (52; 24.2%) of the population disagreed and strongly disagreed, while the remaining 30 (14%) neither agreed nor disagreed. For Item PE3, almost two-thirds of the respondents (136; 63.2%) agreed and strongly agreed that using WhatsApp for ERT promoted their teaching goals. Only 52 (22.8%) respondents disagreed and strongly disagreed, while the remaining 30 (14%) were neither in agreement nor disagreement to it. Finally, the results for Item PE4 show that many respondents (135; 62.8%) agreed and strongly agreed that using WhatsApp for ERT would increase their teaching productivity. Only 50 (23.2%) disagreed and strongly disagreed, while 30 (14%) were neutral to the statement.

The results on performance expectancy demonstrate that secondary school teachers believed that using WhatsApp for ERT would benefit them. This finding is in line with the finding of a study conducted by Ting and Aziz (2021) in Malaysia, who found that teachers believed that using digital tools for ERT would improve their job performance. Similarly, in Saudi Arabia, Alharbi et al. (2022) revealed that secondary school teachers believed that using an LMS for teaching benefited them. Furthermore, the findings on performance expectancy in this study correspond with the findings of research done by Jevsikova et al. (2021) in Lithuania, who reported that teachers believed that using distance learning technologies for ERT improved their job performance.

#### 5.5.2.2 Effort expectancy

Effort expectancy included four items measuring the extent to which secondary school teachers believed that using WhatsApp for ERT was easy and effortless. Table 5.8 shows the frequency distribution of the effort expectancy elements.

**Table 5.8: Frequency distribution of effort expectancy items**

Effort expectancy (EE) [N (%)]					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
EE1: Learning how to use WhatsApp for emergency remote teaching is easy for me.	15 (7)	27 (12.6)	31 (14.4)	63 (29.3)	79 (36.7)
EE2: I find WhatsApp easy to use for emergency remote teaching.	14 (6.5)	27 (12.6)	27 (12.6)	71 (33)	76 (35.3)
EE3: It is easy for me to become proficient in using WhatsApp for emergency remote teaching.	15 (7)	28 (13)	33 (15.4)	65 (30.2)	74 (34.4)
EE4: Using WhatsApp for emergency remote teaching is clear and understandable.	13 (6.1)	28 (13)	28 (13)	64 (29.8)	82 (38.1)

As shown in Table 5.8, almost two-thirds of the respondents (142; 66%) agreed and strongly agreed with the statement in Item EE1 that learning how to use WhatsApp for ERT was easy. Less than a quarter (42; 19.6%) disagreed and strongly disagreed, while 31 (14.4%) were neutral to the statement. In addition, for Item EE2, just over

two-thirds of the respondents (147; 68.3%) agreed and strongly agreed that they found WhatsApp easy to use for ERT. Only 41 (19.1%) disagreed and strongly disagreed, and 27 (12.6%) neither agreed nor disagreed. On the other hand, the results for Item EE3 demonstrated that a large number of respondents (139; 64.6%) agreed and strongly agreed that it was easy for them to become proficient in using WhatsApp for ERT. Less than a quarter of the respondents (43; 20%) disagreed and strongly disagreed, whereas 28 (15.4%) were neutral to the statement. Furthermore, concerning Item EE4, just over two-thirds of the respondents (146; 67.9%) agreed and strongly agreed that using WhatsApp for ERT was clear and understandable. However, 41 (19%) disagreed and strongly disagreed, while 28 (13%) were neither in agreement nor disagreement.

The results on effort expectancy suggest that secondary school teachers believed that using WhatsApp for ERT was easy and effortless. This finding is consistent with that of a study undertaken by Omar et al. (2019) in Malaysia, who revealed that secondary school teachers believed that using mobile technology for teaching was easy and effortless. In addition, this finding is supported by Shah et al. (2021), who reported that secondary school teachers in Pakistan believed that using ICT for teaching was easy and simple. Furthermore, the finding on effort expectancy in this study bears similarities to that of research carried out by Adov et al. (2020) in Estonia, who found that secondary school teachers believed that using mobile devices for teaching was easy and effortless.

#### *5.5.2.3 Social influence*

For this study, social influence comprised four items assessing the extent to which secondary school teachers felt that important others believed that they should use WhatsApp for ERT. Table 5.9 demonstrates the frequency distribution of the social influence items.

**Table 5.9: Frequency distribution of social influence items**

<b>Social influence (SI) [N (%)]</b>					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
SI1: Parents of the learners think that I should use WhatsApp for emergency remote teaching.	19 (8.8)	29 (13.5)	18 (8.4)	65 (30.2)	84 (39.1)
SI2: My learners think that I should use WhatsApp for emergency remote teaching.	20 (9.3)	21 (9.8)	18 (8.4)	76 (35.3)	80 (37.2)
SI3: My colleagues think that I should use WhatsApp for emergency remote teaching.	20 (9.3)	21 (9.8)	24 (11.2)	71 (33)	79 (36.7)
SI4: The school management team is supportive of using WhatsApp for emergency remote teaching.	19 (8.8)	21 (9.8)	21 (9.8)	68 (31.6)	86 (40)

It may be observed from Table 5.9 that for Item SI1, most respondents (149; 69.3%) agreed and strongly agreed that parents of the learners thought they should use WhatsApp for ERT. Very few respondents (48; 22.3%) disagreed and strongly disagreed, while 18 (8.4%) neither agreed nor disagreed. For Item SI2, almost three-quarters of the respondents (156; 72.5%) agreed and strongly agreed that their learners thought they should use WhatsApp for ERT. Only 41 (19.1%) disagreed and strongly disagreed, whereas 18 (8.4%) were neutral to the statement. Furthermore, for Item SI3, the majority of the respondents (150; 69.7%) agreed and strongly agreed that their colleagues thought they should use WhatsApp for ERT. Only a small number of respondents (41; 19.1%) disagreed and strongly disagreed, while 24 (11.2%) neither agreed nor disagreed. Lastly, a large proportion of respondents 154 (71.6%) agreed and strongly agreed to Item SI4 that the school management team was supportive of using WhatsApp for ERT. Only 40 (18.6%) disagreed and strongly disagreed, while the remaining 21 (9.8%) were neutral about the statement.

The results on social influence indicate that secondary school teachers felt that other teachers, the school management, learners and parents of the learners believed that they should use WhatsApp for ERT. This finding is parallel with that of Riady et al.'s (2022) in Indonesia that school teachers felt that their important others believed that

they should adopt social media for remote teaching. Moreover, Yildiz Durak (2019), in their study investigating the factors influencing teachers' acceptance and use of social networks for educational purposes in Turkey, found similar results to this study, where the teachers indicated that their important others thought they should use social networks for educational purposes.

#### 5.5.2.4 Facilitating conditions

Facilitating conditions contained four items evaluating the degree to which secondary school teachers believed that organisational resources and technical assistance existed to aid the use of WhatsApp for ERT. Table 5.10 depicts the frequency distribution of the facilitating conditions items.

**Table 5.10: Frequency distribution of facilitating conditions items**

<b>Facilitating conditions (FC) [N (%)]</b>					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
FC1: I have the resources (e.g. mobile device and internet connection) necessary to use WhatsApp for emergency remote teaching.	12 (5.6)	19 (8.8)	21 (9.8)	78 (36.3)	85 (39.5)
FC2: I am knowledgeable about using WhatsApp for emergency remote teaching.	16 (7.4)	20 (9.3)	24 (11.2)	81 (37.7)	74 (34.4)
FC3: I can get help from other colleagues if I have difficulties navigating through the WhatsApp functions and using WhatsApp for emergency remote teaching.	19 (8.8)	23 (10.7)	21 (9.8)	82 (38.1)	70 (32.6)
FC4: WhatsApp is similar to other digital tools (e.g. Telegram) I use for emergency remote teaching.	18 (8.4)	21 (9.8)	24 (11.2)	78 (36.3)	74 (34.4)

From Table 5.10, it can be seen that for Item FC1, a high proportion of respondents (163; 75.8%) agreed and strongly agreed that they had the resources required to use WhatsApp for ERT. Very few respondents (31; 14.4%) disagreed and strongly disagreed with the statement, while 21 (9.8%) were neutral. Regarding Item FC2, a large number of respondents (155; 72.1%) agreed and strongly agreed that they were knowledgeable about using WhatsApp for ERT. Only 36 (16.7%) disagreed and

strongly disagreed, whereas the remaining 24 (11.2%) neither agreed nor disagreed. In addition, for Item FC3, most respondents (152; 70.7%) agreed and strongly agreed that they could get help from other colleagues if they had difficulties navigating through the WhatsApp functions and using WhatsApp for ERT. Only 42 (19.5%) disagreed and strongly disagreed, while 21 (9.8%) neither agreed nor disagreed. Moreover, the majority of the respondents (152; 70.7%) agreed and strongly agreed with the statement in Item FC4 that WhatsApp was similar to other digital tools they used for ERT. Few respondents (39; 18.2%) disagreed and strongly disagreed, while 24 (11.2%) were neither in agreement nor disagreement with the statement.

The results on facilitating conditions imply that secondary school teachers believed that organisational resources and technical support were available to support the use of WhatsApp for ERT. This finding is in agreement with that reported by Graham et al. (2020) in South Africa, who found that teachers believed that organisational resources and technical support were available to support the use of ICTs for teaching. Furthermore, this finding aligns with the finding of Del Valle et al. (2017), who found that teachers believed that organisational resources and technical support were available to support the use of social media for teaching and learning.

#### *5.5.2.5 Hedonic motivation*

In this study, hedonic motivation included four items designed to measure the fun and enjoyment experienced by secondary school teachers when using WhatsApp for ERT. Table 5.11 illustrates the frequency distribution of the hedonic motivation items.

**Table 5.11: Frequency distribution of hedonic motivation items**

<b>Hedonic motivation (HM) [N (%)]</b>					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
HM1: Using WhatsApp for emergency remote teaching is fun.	14 (6.5)	15 (7)	7 (3.3)	79 (36.7)	100 (46.5)
HM2: Using WhatsApp for emergency remote teaching is enjoyable.	10 (4.7)	22 (10.2)	8 (3.7)	77 (35.8)	98 (45.6)
HM3: Using WhatsApp for emergency remote teaching is exciting.	16 (7.4)	18 (8.4)	7 (3.3)	84 (39.1)	90 (41.9)
HM4: Using WhatsApp for emergency remote teaching is interesting.	13 (6)	18 (8.4)	6 (2.8)	80 (37.2)	98 (45.6)

As Table 5.11 shows, the vast majority of the respondents (179; 83.2%) agreed and strongly agreed with the statement in Item HM1 that using WhatsApp for ERT was fun. Only 29 (13.5%) of the respondents disagreed and strongly disagreed, while the remaining 7 (3.3%) were neither in agreement nor disagreement. In response to Item HM2, most respondents (175; 81.4%) agreed and strongly agreed that using WhatsApp for ERT was enjoyable. Less than a quarter of the respondents (32; 14.9%) disagreed and strongly disagreed, while 8 (3.7%) were neutral about the statement. Furthermore, a high proportion of respondents (174; 81%) agreed and strongly agreed with the statement in Item HM3 that using WhatsApp for ERT was exciting. Only a small number of respondents (34; 15.8%) disagreed and strongly disagreed, whereas 7 (3.3%) neither agreed nor disagreed. Moreover, for Item HM4, most respondents (178; 82.8%) agreed and strongly agreed that using WhatsApp for ERT was interesting. Only 31(14.4%) disagreed and strongly disagreed, while the remaining 6 (2.8%) were neutral about the statement.

The results of hedonic motivation show that using WhatsApp for ERT was fun, enjoyable, exciting and interesting for secondary school teachers. This finding is at variance with the finding of Mtebe et al. (2016) in Tanzania that secondary school teachers obtained enjoyment from using multimedia-enhanced content. Furthermore, this finding is in line with the submission of Dahri et al. (2021) in Pakistan, who reported



that elementary school teachers had derived pleasure when using mobile collaborative learning for continuous professional development. Moreover, the finding of hedonic motivation in this study is also in conformity with the finding of Avcı (2022) in Turkey, who revealed that primary and secondary school teachers found the use of digital learning resources entertaining.

#### 5.5.2.6 Teaching value

Teaching value is a new construct introduced by this study to measure the cognitive trade-off between the perceived value of WhatsApp and the time and effort spent using it for teaching. It incorporated four items. The frequency distribution of the teaching value items is shown in Table 5.12.

**Table 5.12: Frequency distribution of teaching value items**

Teaching value (TV) [N (%)]					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
TV1: Teaching through WhatsApp is worth more than the time and effort given to it.	15 (7)	15 (7)	23 (10.7)	66 (30.7)	96 (44.7)
TV2: WhatsApp gives me the opportunity to control my own teaching time.	13 (6)	17 (7.9)	21 (9.8)	72 (33.5)	92 (42.8)
TV3: WhatsApp allows me to share educational content quickly and easily.	12 (5.6)	22 (10.2)	20 (9.3)	74 (34.4)	87 (40.5)
TV4: WhatsApp provides me with the opportunity to achieve my teaching objectives.	13 (6)	22 (10.2)	22 (10.2)	80 (37.2)	78 (36.3)

As can be seen from Table 5.12, three-quarters of the respondents (162; 75.4%) agreed and strongly agreed with the statement in Item TV1 that teaching through WhatsApp was worth more than the time and effort given to it. Only a small proportion of the respondents (30; 14%) disagreed and strongly disagreed with the statement, while 23 (10.7%) were neutral. The data in the table also show that just over three-quarters of the respondents (164; 76.3%) agreed and strongly agreed with the statement in Item TV2 that WhatsApp gave them the opportunity to control their own teaching time. Very few respondents (30; 13.9%) disagreed and strongly disagreed with the statement, while 21 (9.8%) were neither in agreement nor disagreement.

Furthermore, for Item TV3, a large proportion of the respondents (164; 74.9%) agreed and strongly agreed that WhatsApp allowed them to share educational content quickly and easily. Only 34 (15.8%) disagreed and strongly disagreed with the statement, whereas 20 (9.3%) neither agreed nor disagreed. Finally, for Item TV4, the majority of the respondents (158; 73.5%) agreed and strongly agreed that WhatsApp provided them with the opportunity to achieve their teaching objectives. Only 25 (16.2%) strongly disagreed and disagreed, while 22 (10.2%) neither agreed nor disagreed.

The results on teaching value show that teachers had positive perceptions about using WhatsApp for teaching that influenced their intention to spend more time and effort on using it for ERT. This finding supports an earlier finding by Ain et al. (2015) in Malaysia that students had positive perceptions about the time and effort put into using LMSs for learning. The finding further corroborates the finding of Prasetyo et al. (2021) in the investigation of the factors influencing medical students' acceptance of e-learning platforms in the Philippines. Their study reported that medical students believed that the time and effort they put into using e-learning platforms for learning represented good value.

#### *5.5.2.7 Habit*

The habit construct consisted of five items evaluating the degree to which secondary school teachers tended to use WhatsApp for ERT automatically. Table 5.13 demonstrates the frequency distribution of the habit items.

**Table 5.13: Frequency distribution of habit items**

Habit (HT) [N (%)]					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
HT1: The use of WhatsApp for emergency remote teaching has become a habit for me.	8 (3.7)	14 (6.5)	13 (6)	60 (27.9)	120 (55.8)
HT2: I am addicted to using WhatsApp for emergency remote teaching.	13 (6)	19 (8.8)	10 (4.7)	69 (32.1)	104 (48.4)
HT3: I must use WhatsApp for emergency remote teaching.	14 (6.5)	18 (8.4)	13 (6)	62 (28.8)	108 (50.2)
HT4: Using WhatsApp for emergency remote teaching motivates me to learn more about the use of WhatsApp for emergency remote teaching.	9 (4.2)	15 (7)	9 (4.2)	66 (30.7)	116 (54)

It can be seen from Table 5.13 that the vast majority of the respondents (180; 83.7%) agreed and strongly agreed with the statement in Item HT1 that using WhatsApp for ERT had become a habit for them. Very few respondents (22; 10.2%) disagreed and strongly disagreed, while 13 (6%) were neither in agreement nor disagreement. The results for Item HT2 demonstrate that a high number of respondents (173; 80.5%) agreed and strongly agreed that they were addicted to using WhatsApp for ERT. Only 32 (14.8%) disagreed and strongly disagreed, whereas the remaining 10 (4.7%) neither agreed nor disagreed with the statement. For Item HT3, more than three-quarters of the respondents (170; 79%) agreed and strongly agreed that they had to use WhatsApp for ERT. Only a small number of respondents (32; 14.9%) disagreed and strongly disagreed, while 13 (6%) were neutral about the statement. For Item HT4, most respondents (182; 84.7%) agreed and strongly agreed that using WhatsApp for ERT motivated them to learn more about the use of WhatsApp for ERT. A small number of respondents (24; 11.2%) disagreed and strongly disagreed, while 9 (4.2%) were neither in agreement nor disagreement.

The results on habit demonstrate that secondary school teachers tended to have habitual behaviours of using WhatsApp for ERT. This finding is in consonance with a finding by Huang (2018) in China, who revealed that teachers had habitual behaviours

of using social media for teaching. The finding is also concurrent with the finding of Del Valle et al. (2017), that teachers tended to use social media for teaching voluntarily.

#### 5.5.2.8 Attitude towards use

Attitude towards use comprised four items measuring the feeling of secondary school teachers in using WhatsApp for ERT. Table 5.14 indicates the frequency distribution of the attitude towards use items.

**Table 5.14: Frequency distribution of attitude towards use items**

Attitude towards use (ATU) [N (%)]					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
ATU1: Using WhatsApp for emergency remote teaching is a good idea.	8 (3.7)	19 (8.8)	10 (4.7)	81 (37.7)	97 (45.1)
ATU2: I like using WhatsApp for emergency remote teaching.	8 (3.7)	20 (9.3)	12 (5.6)	87 (40.5)	88 (40.9)
ATU3: Using WhatsApp for emergency remote teaching makes my work interesting.	6 (2.8)	8 (3.7)	10 (4.7)	86 (40)	105 (48.8)
ATU4: I think it is valuable to use WhatsApp for emergency remote teaching.	6 (2.8)	7 (3.3)	10 (4.7)	84 (39.1)	108 (50.2)

The data from Table 5.14 demonstrate that a high number of respondents (178; 82.8%) agreed and strongly agreed with the statement in Item ATU1 that using WhatsApp for ERT was a good idea. Only 27 (12.5%) disagreed and strongly disagreed with it, whereas 10 (4.7%) were neither in agreement nor disagreement. Concerning Item ATU2, a large proportion of the respondents (175; 81.4%) agreed and strongly agreed that they liked using WhatsApp for ERT. Only 28 (13%) disagreed and strongly disagreed, whereas the remaining 12 (5.6%) were neither in agreement nor disagreement. Furthermore, the vast majority of the respondents (191; 88.8%) agreed and strongly agreed with the statement in Item ATU3 that using WhatsApp for ERT made their work interesting. Very few respondents (14; 6.5%) disagreed and strongly disagreed, while 10 (4.7%) were neutral about the statement. Moreover, for

Item ATU4, many respondents (192; 89.3%) agreed and strongly agreed that they thought it was valuable to use WhatsApp for ERT. Very few (13; 6.1%) disagreed and strongly disagreed with the statement, while the remaining 10 (4.7%) neither agreed nor disagreed.

The results on attitude towards use show that secondary school teachers had a positive attitude towards using WhatsApp for ERT. This finding is supported by Adov et al. (2020) in Estonia, who found that secondary school teachers demonstrated positive attitude towards using mobile devices for teaching. Furthermore, the finding is in line with the finding of Jere (2020) in South Africa, who reported that teachers had positive attitude towards using e-learning platforms for teaching. The finding on attitude towards use in the current study further corresponds with the finding of a study by Sangeeta and Tandon (2021) in North India, who revealed that teachers had a positive attitude towards using online teaching during the Covid-19 pandemic.

#### *5.5.2.9 Personal innovativeness*

Personal innovativeness incorporated four items assessing secondary school teachers' willingness to try out new WhatsApp features for ERT. Table 5.15 displays the frequency distribution of the personal innovativeness items.

**Table 5.15: Frequency distribution of personal innovativeness items**

<b>Personal innovativeness (PI) [N (%)]</b>					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
PI1: I like to try new WhatsApp features for emergency remote teaching.	11 (5.1)	10 (4.7)	10 (4.7)	75 (34.9)	109 (50.7)
PI2: When I hear about new WhatsApp features, I would look for ways to experiment with them in emergency remote teaching.	11 (5.1)	12 (5.6)	10 (4.7)	74 (34.4)	108 (50.2)
PI3: Among my colleagues, I'm usually one of the first to try out new WhatsApp features for emergency remote teaching.	10 (4.7)	28 (13)	9 (4.2)	82 (38.1)	86 (40)
PI4: In general, I am reluctant to try new WhatsApp features for emergency remote teaching.	85 (39.5)	88 (40.9)	9 (4.2)	26 (12.1)	7 (3.3)

As demonstrated in Table 5.15, for Item PI1, the majority of the respondents (184; 85.6%) agreed and strongly agreed that they would like to try new WhatsApp features for ERT. Only 21 (9.8%) respondents disagreed and strongly disagreed, while 10 (4.7%) were neutral about the statement. For Item PI2, most respondents (182; 84.6%) agreed and strongly agreed that if they heard about new WhatsApp features, they would look for ways to experiment with them in ERT. Very few respondents (23; 10.7%) disagreed and strongly disagreed with it, whereas 10 (4.7%) were neither in agreement nor disagreement. In response to Item PI3, more than three-quarters of the respondents (168; 78.1%) agreed and strongly agreed that they were usually the first among their colleagues to try new WhatsApp features for ERT. Only 38 (17.7%) disagreed and strongly disagreed, while the remaining 9 (4.2%) neither agreed nor disagreed. Moreover, the majority of the respondents (173; 80.4%) disagreed and strongly disagreed with the statement in Item PI4 that, in general, they were reluctant to try new WhatsApp features for ERT. Only a small number of respondents (33; 15.4%) agreed and strongly agreed, while 9 (4.2%) were neutral about the statement.

The results on personal innovativeness suggest that secondary school teachers demonstrated a willingness to try out new WhatsApp features for ERT. This finding

correlates with the finding of Tiwari et al. (2022) in India that teachers had higher innovativeness to try out new ICTs for teaching during ERT. Furthermore, the finding on personal innovativeness in the current study is consistent with the finding of a study conducted by Akar (2019) in Turkey, who revealed that school teachers demonstrated a willingness to try out new technology for teaching.

#### 5.5.2.10 Self-efficacy

Self-efficacy contained four items evaluating secondary school teachers' confidence in their ability to use WhatsApp for ERT. Table 5.16 shows the frequency distribution of the self-efficacy items.

**Table 5.16: Frequency distribution of self-efficacy items**

<b>Self-efficacy (SE) [N (%)]</b>					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
SE1: I know how to use WhatsApp for emergency remote teaching.	18 (8.4)	17 (7.9)	16 (7.4)	85 (39.5)	79 (36.7)
SE2: I am confident in using WhatsApp for emergency remote teaching even if there is no one around to show me how to do it.	15 (7)	19 (8.8)	15 (7)	82 (38.1)	84 (39.1)
SE3: I am confident in using WhatsApp for emergency remote teaching even if I have never used WhatsApp for teaching before.	13 (6)	14 (6.5)	16 (7.4)	87 (40.5)	85 (39.5)
SE4: I feel I am in control when I use WhatsApp for emergency remote teaching.	13 (6)	17 (7.9)	15 (7)	78 (36.3)	92 (42.8)

As can be observed from Table 5.16, for Item SE1, just over three-quarters of the respondents (164; 76.2%) agreed and strongly agreed that they knew how to use WhatsApp for ERT. Only 35 (16.3%) disagreed and strongly disagreed with the statement, while 16 (7.4%) were neither in agreement nor disagreement. With regard to Item SE2, most respondents (166; 77.2%) agreed and strongly agreed that they were confident in using WhatsApp for ERT even if there was no one around to show them how to do it. Only a small proportion of the respondents (34; 15.8%) disagreed and strongly disagreed with the statement, whereas 15 (7%) neither agreed nor

disagreed. Furthermore, a high number of respondents (175; 80%) agreed and strongly agreed with the statement in Item SE3 that they were confident in using WhatsApp for ERT even if they had never used WhatsApp for teaching before. Very few respondents (27; 12.5%) disagreed and strongly disagreed, whereas 16 (7.4%) were neutral to it. Finally, for Item SE4, more than three-quarters of the respondents (170; 79.1%) agreed and strongly agreed that they felt that they were in control when they used WhatsApp for ERT. Only 30 (13.9%) disagreed and strongly disagreed, while the remaining 15 (7%) were neither in agreement nor disagreement.

The results on self-efficacy explain that secondary school teachers had confidence in their ability to use WhatsApp for ERT. This finding agrees with the finding of a previous study conducted by Ahmed and Tolorunleke (2017) in Nigeria, who revealed that secondary school teachers had confidence in their use of social media for teaching. This finding is also consistent with the finding of a study undertaken by Ikwuka et al. (2021) in Nigeria that secondary school teachers had confidence in their use of social media for teaching.

#### *5.5.2.11 Behavioural intention*

Behavioural intention comprised four items measuring secondary school teachers' likelihood of using WhatsApp for ERT in the future. Table 5.17 depicts the frequency distribution of the behavioural intention items.



**Table 5.17: Frequency distribution of behavioural intention items**

<b>Behavioural intention (BI) [N (%)]</b>					
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
BI1: I intend to continue using WhatsApp for emergency remote teaching in the future.	12 (5.6)	22 (10.2)	20 (9.3)	74 (34.4)	87 (40.5)
BI2: I always consider using WhatsApp for emergency remote teaching.	10 (4.7)	22 (10.2)	8 (3.7)	77 (35.8)	98 (45.6)
BI3: I will continue using WhatsApp for emergency remote teaching regularly.	4 (1.9)	12 (5.6)	4 (1.9)	82 (38.1)	113 (52.6)
BI4: I will recommend to other teachers to use WhatsApp for emergency remote teaching.	4 (1.9)	8 (3.7)	5 (2.3)	80 (37.2)	118 (54.9)

As shown in Table 5.17, almost three-quarters (161; 74.9%) of the respondents agreed and strongly agreed with the statement in Item BI1 that they intended to continue using WhatsApp for ERT in the future. Only 34 (15.8%) disagreed and strongly disagreed, while 20 (9.3%) were neither in agreement nor disagreement. For Item BI2, a large number of respondents (175; 81.4%) agreed and strongly agreed that they always considered using WhatsApp for ERT. A small proportion of the respondents (32; 14.9%) disagreed and strongly disagreed with the statement, while the remaining 8 (3.7%) were neither in agreement nor disagreement. Furthermore, for Item BI3, the majority of the respondents (195; 90.7%) agreed and strongly agreed that they would continue to use WhatsApp for ERT on a regular basis. Only 16 (7.5%) disagreed and strongly disagreed, while 4 (1.9%) neither agreed nor disagreed. Moreover, for Item BI4, a large proportion of the respondents (198; 92.1%) agreed and strongly agreed that they would recommend other teachers to use WhatsApp for ERT. Very few respondents (12; 5.6%) disagreed and strongly disagreed, whereas 5 (2.3%) neither agreed nor disagreed with the statement.

The results on behavioural intention demonstrate that secondary school teachers had behavioural intentions to use WhatsApp for ERT in the future. This finding is parallel with the finding of research done by Graham et al. (2020) in South Africa that secondary school teachers had demonstrated intentions to use ICT for teaching. This

finding also corroborates the finding of a study conducted by Rudhumbu et al. (2021) in Zimbabwe, who reported that secondary school teachers had behavioural intentions to adopt and use ICT for teaching.

## 5.6 RELIABILITY

Reliability is concerned with the consistency of the questionnaire (Heale & Twycross, 2015). For this study, the reliability of the questionnaire was evaluated using internal consistency reliability. Internal consistency reliability refers to the degree to which a questionnaire yields consistent and steady results (Taherdoost, 2016b). Assessment of the internal consistency reliability was done by computing Cronbach's alpha values using SPSS. Cronbach's alpha value is a number between 0 and 1, and the closer it is to 1, the more reliable it is (Hair et al. (2021). Table 5.18 displays the Cronbach's alpha values for each construct and the overall value.

**Table 5.18: Results of Cronbach's alpha**

<b>Construct</b>	<b>Number of items</b>	<b>Cronbach's alpha</b>
Performance expectancy	4	0.941
Effort expectancy	4	0.940
Social influence	4	0.941
Facilitating conditions	4	0.896
Hedonic motivation	4	0.757
Teaching value	4	0.949
Habit	4	0.756
Attitude towards use	4	0.903
Personal innovativeness	4	0.895
Self-efficacy	4	0.872
Behavioural intention	4	0.981
<b>Overall</b>	<b>44</b>	<b>0.882</b>

From the table above, it can be seen that all the constructs employed to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for ERT had Cronbach's alpha values that ranged from 0.756 to 0.981, above the cut-off value of 0.7 (Hair et al., 2021). This indicates that all the constructs of the extended UTAUT2 achieved internal consistency reliability. Moreover, an overall Cronbach's alpha value of 0.882 was achieved, thereby indicating good internal consistency reliability (Hair et al., 2021).

## **5.7 THE LEVEL OF ACCEPTANCE AND USE OF WHATSAPP FOR EMERGENCY REMOTE TEACHING IN THE NAMAKGALE CIRCUIT**

This section addresses the research sub-question 1: What is the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit? Secondary school teachers' level of acceptance and use of WhatsApp for ERT is critical to the successful implementation of ERT using WhatsApp. For this study, the level of acceptance and use of WhatsApp for ERT was assessed by computing the overall mean of the constructs of the extended UTAUT2. The mean represents the average of the data set (Sutanapong & Louangrath, 2015). It is important to note that each construct's items were evaluated using a five-point Likert scale, with 1 denoting "Strongly disagree", 2 denoting "Disagree", 3 denoting "Neither agree nor disagree", 4 denoting "Agree" and 5 denoting "Strongly agree". It is also worth mentioning at this juncture that the scores for the negative statement in Item PI4 (In general, I am reluctant to try new WhatsApp features for emergency remote teaching) were reversed, as suggested by Chyung et al. (2018).

The level of acceptance and use of WhatsApp for ERT was divided into three levels: low, moderate and high, as suggested by Deris and Shukor (2019). According to them, a mean value ranging from 1.00 to 2.33 indicates a low level, 2.34 to 3.66 implies a moderate level and 3.67 to 5.00 signifies a high level of acceptance and use (Deris & Shukor, 2019). Table 5.19 displays the level of acceptance and use of WhatsApp for ERT for each construct as well as the overall level of acceptance and use.

**Table 5.19: Level of acceptance and use of WhatsApp for ERT**

<b>Construct</b>	<b>Mean</b>	<b>Level</b>
Performance expectancy	3.58	Moderate
Effort expectancy	3.77	High
Social influence	3.80	High
Facilitating conditions	3.83	High
Hedonic motivation	4.06	High
Teaching value	3.95	High
Habit	4.16	High
Attitude towards use	4.19	High
Personal innovativeness	4.09	High
Self-efficacy	3.96	High
Behavioural intention	4.35	High
<b>Overall</b>	<b>3.97</b>	<b>High</b>

As displayed in Table 5.19, the mean values for the constructs of effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention ranged from 3.77 to 4.35, indicating a high level of acceptance and use of WhatsApp for ERT. Only performance expectancy recorded a mean value of 3.58, suggesting a moderate level of acceptance and use of WhatsApp for ERT. Furthermore, the overall mean value of the constructs was 3.97, which demonstrates a high level of acceptance and use of WhatsApp for ERT. Therefore, it can be concluded that secondary school teachers in the Namakgale Circuit had a high level of acceptance and use of WhatsApp for ERT influenced by all the constructs of the extended UTAUT2, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention.

The reasons for this high level of acceptance and use of WhatsApp for ERT by secondary school teachers could be that they benefited from using WhatsApp for ERT, it was easy and effortless for them to use WhatsApp for ERT, and they thought that their important others believed that they should use WhatsApp for ERT. They also had

positive perceptions about using WhatsApp for teaching that influenced their intention to spend more time and effort on using WhatsApp for ERT, had more fun and enjoyment, and developed habitual behaviours when using WhatsApp for ERT. In addition, they had a positive attitude towards using WhatsApp for ERT, demonstrated willingness to try out new WhatsApp features for ERT, were confident in their ability to use WhatsApp for ERT, and planned to use WhatsApp for ERT in the future. This shows that the high level of acceptance and use of WhatsApp for ERT was reflected in secondary school teachers' agreement with almost all the aspects of the constructs of the extended UTAUT2.

The findings of this study corroborate the findings of previous studies (Asghar et al., 2021; Gümüşoğlu & Akay, 2017; Ismail et al., 2022). For example, a study conducted by Ismail et al. (2022) in Malaysia found that secondary school teachers had a high level of acceptance and use of mobile technology for teaching that was influenced by performance, effort expectancy, social influence, facilitating conditions, price value, hedonic motivation, habit and behavioural intention. Gümüşoğlu and Akay (2017) in Turkey revealed that teachers had a high level of technology acceptance influenced by performance expectancy, effort expectancy, attitude towards using technology, social influence, facilitating conditions, self-efficacy and anxiety. In Pakistan, Asghar et al. (2021) discovered that pre-service teachers had a high level of readiness and acceptance of mobile learning technology that was influenced by personal innovativeness, quality of services, social influence, effort expectancy, performance expectancy and behavioural intention.

## **5.8 SAMPLING ADEQUACY**

Hair et al. (2010) stress the evaluation of the appropriateness of the data using sampling adequacy tests before performing factor analysis. Therefore, in this study, two sampling adequacy tests, namely the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1974) and Bartlett's test of sphericity (Bartlett, 1951), were performed on the data to verify whether factor analysis could be applied. According to Kaiser (1974), a KMO value of 0.50 and above is acceptable and factor analysis should be performed. Conversely, a Bartlett's test of sphericity value of less than 0.05 is significant, suggesting that the data are suitable for factor analysis (Bartlett, 1951). Table 5.20 demonstrates the results of the KMO and Bartlett's test of

sphericity of each construct and the overall results of the KMO and Bartlett's test of sphericity.

**Table 5.20: Results of KMO and Bartlett's test of sphericity**

Construct	KMO measure of sampling adequacy	Bartlett's test of sphericity		
		Approx. chi-square	df	Sig.
Performance expectancy	0.857	775.706	6	< 0.001
Effort expectancy	0.848	776.648	6	< 0.001
Social influence	0.853	810.826	6	< 0.001
Facilitating conditions	0.830	518.720	6	< 0.001
Hedonic motivation	0.760	203.564	6	< 0.001
Teaching value	0.786	886.824	6	< 0.001
Habit	0.756	202.151	6	< 0.001
Attitude towards use	0.650	891.216	6	< 0.001
Personal innovativeness	0.672	873.732	6	< 0.001
Self-efficacy	0.664	603.530	6	< 0.001
Behavioural intention	0.682	505.630	6	< 0.001
<b>Overall</b>	<b>0.730</b>	<b>7 709.367</b>	<b>946</b>	<b>0.000</b>

As displayed in Table 5.20, the result of the KMO measure of sampling adequacy for all the constructs ranged from 0.650 to 0.857, higher than the recommended threshold of 0.50, and the result of Bartlett's test of sphericity was significant at < 0.001 for all the constructs, indicating that all the constructs were suitable for factor analysis. Furthermore, the overall result of the KMO measure of sampling adequacy was 0.730, which is higher than the recommended benchmark of 0.50, and the result of Bartlett's test of sphericity was 0.000, which is much lower than 0.05, showing that factor analysis was appropriate.

## 5.9 STRUCTURAL EQUATION MODELLING ANALYSIS

In this study, AMOS was used to perform the SEM analysis. Hair et al. (2021) state that the analysis of SEM using AMOS involves the use of the CB-SEM method. The CB-SEM method was chosen because it is used when the objective of the study is theory testing and confirmation (Decman, 2020). CB-SEM analysis using AMOS involved two stages: firstly, the measurement model was assessed, and secondly, the structural model was assessed (see Hair et al., 2021). The results of the measurement model and structural model are presented in the following sub-sections.

### 5.9.1 Assessment of the measurement model

The measurement model, also known as the ‘measurement theory’ or ‘outer model’, describes which indicator variables are used to measure a certain construct and how they are used (Hair et al., 2021). It is evaluated to confirm the validity of the measurement instrument. In this study, CFA was employed to examine the validity of the constructs of the extended UTAUT2. For this study, the assessment of the measurement model using CFA began by establishing convergent validity, and thereafter discriminant validity. The results of the convergent validity and discriminant validity are presented in the following sub-sections.

#### 5.9.1.1 Convergent validity

In this study, convergent validity was measured by evaluating the factor loadings of the items, composite reliability and AVE of the constructs (Fornell & Larcker, 1981). Table 5.21 illustrates the results on convergent validity. The results in the table demonstrate that all factor loadings values ranged from 0.53 to 0.99, above the benchmark of 0.50, the composite reliability values ranged from 0.76 to 0.94, above the recommended value of 0.7, and the AVE values ranged from 0.66 to 0.91, higher than the cut-off value of 0.5, thereby confirming convergent validity (see Fornell & Larcker, 1981).

**Table 5.21: Results of convergent validity**

Construct	Item	Factor loadings	Composite reliability	AVE
Performance expectancy	PE1	0.88	0.94	0.89
	PE2	0.87		
	PE3	0.93		

	PE4	0.89		
Effort expectancy	EE1	0.89	0.94	0.89
	EE2	0.93		
	EE3	0.87		
	EE4	0.88		
Social influence	SI1	0.86	0.94	0.89
	SI2	0.83		
	SI3	0.95		
	SI4	0.94		
Facilitating conditions	FC1	0.81	0.90	0.83
	FC2	0.90		
	FC3	0.83		
	FC4	0.77		
Hedonic motivation	HM1	0.62	0.76	0.66
	HM2	0.86		
	HM3	0.53		
	HM4	0.63		
Teaching value	TV1	0.94	0.94	0.91
	TV2	0.97		
	TV3	0.84		
	TV4	0.82		
Habit	HT1	0.53	0.76	0.67
	HT2	0.72		
	HT3	0.63		
	HT4	0.77		
Attitude towards use	ATU1	0.91	0.89	0.82
	ATU2	0.93		
	ATU3	0.72		
	ATU4	0.72		
Personal innovativeness	PI1	0.96	0.88	0.79
	PI2	0.99		
	PI3	0.65		
	PI4	0.56		
Self-efficacy	SE1	0.59	0.86	0.77



	SE2	0.63		
	SE3	0.94		
	SE4	0.91		
Behavioural intention	BI1	0.85	0.86	0.96
	BI2	0.91		
	BI3	0.64		
	BI4	0.69		

### 5.9.1.2 Discriminant validity

Following Fornell and Larker's (1981) criteria for establishing discriminant validity, the current study examined discriminant validity by comparing the square root of AVE for each construct, which should be greater than other constructs. Table 5.22 depicts the correlation matrix for the extended UTAUT2 constructs. As depicted in the table, the square roots of the AVEs (in bold) of all the constructs were higher than the correlations between the constructs, which confirms that discriminant validity was achieved.

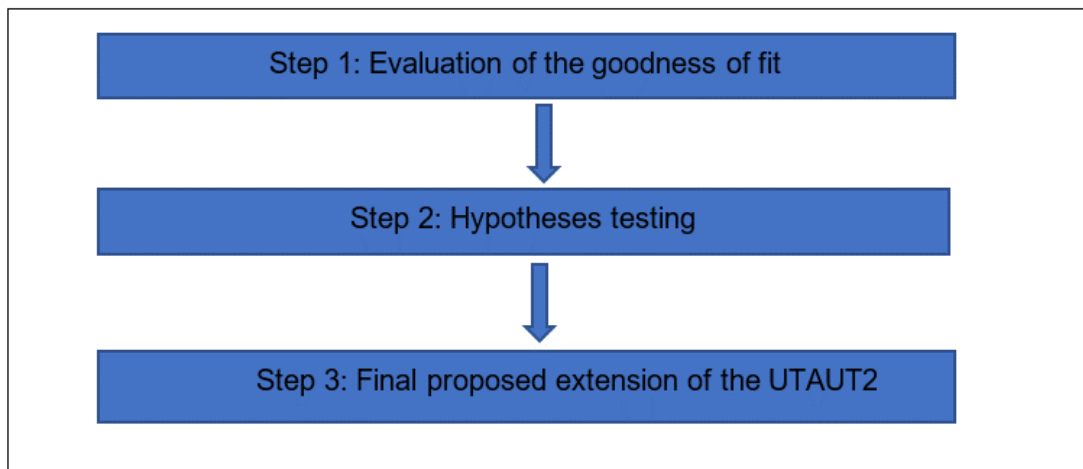
**Table 5.22: Construct correlation matrix**

	ATU	PE	EE	SI	FC	TV	HM	HT	SE	PI	BI
ATU	<b>0.826</b>										
PE	0.144	<b>0.894</b>									
EE	0.041	0.036	<b>0.893</b>								
SI	0.049	0.074	0.166	<b>0.895</b>							
FC	0.187	0.105	0.032	0.081	<b>0.830</b>						
TV	0.059	0.084	0.038	0.181	0.159	<b>0.911</b>					
HM	0.086	0.142	0.183	0.282	0.127	0.335	<b>0.671</b>				
HT	0.112	0.117	0.133	0.22	0.178	0.637	0.436	<b>0.669</b>			
SE	0.132	0.181	0.041	0.075	- 0.078	0.002	0.068	0.037	<b>0.785</b>		
PI	0.153	0.102	0.072	0.25	0.219	0.167	0.337	0.255	0.103	<b>0.813</b>	
BI	0.236	0.258	0.227	0.318	0.312	0.454	0.447	0.525	0.202	0.352	<b>0.964</b>

Note: ATU = attitude towards use; PE = performance expectancy; EE = effort expectancy; SI = social influence; FC = facilitating conditions; TV = teaching value; HM = hedonic motivation; HT = habit; SE = self-efficacy; PI = personal innovation; BI = behavioural intention

### 5.9.2 Assessment of the structural model

After confirming the validity and reliability of the measurement model, the next step in data analysis using the CB-SEM method is the assessment of the structural model. The structural model, also known as the 'structural theory' or 'inner model', explains how constructs relate to one another (Hair et al., 2021). In this study, the structural model was assessed in four steps, as depicted in Figure 5.3. As demonstrated in Figure 5.3, firstly, the data fit with the structural model was evaluated. Secondly, the hypothesised relationships were tested. Finally, the structural model was modified by removing insignificant paths to propose the final extension of the UTAUT2.



**Figure 5.3: Steps for evaluating the structural model**

#### *5.9.2.1 Evaluation of the goodness of fit*

Assessment of the goodness of fit between the structural model and the dataset is one of the crucial steps in CB-SEM analysis. Hair et al. (2021) emphasise that researchers must assess the goodness of fit of the structural model before testing any hypothesised relationships, as structural models with poor fit deliver less information than the dataset has. The goodness of fit describes how well the structural model fits the empirical data (Hair et al., 2018). Various fit indices can be used to assess the goodness of fit of the structural model. Fit indices indicate whether or not there is a difference between the estimated and the observed covariance matrices (Sahoo, 2019). For this study, six fit indices suggested by Pahlevan Sharif and Sharif Nia (2018) were used to measure the goodness of fit of the structural model, namely normed chi-square (chi-square/df), incremental fit index (IFI), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA) and the standardised root mean square residual (SRMR). Chi-square/df evaluates the

overall fit by dividing the chi-square index value of the structural model by the degrees of freedom (Sahoo, 2019).

A chi-square/df value of 3 or less indicates a good fit (Dash & Paul, 2021). In contrast, the CFI compares the chi-square value of the structural model with that of the null or baseline model (Sahoo, 2019). The null or baseline model implies that all the assessed indicators or variables are not correlated (Dash & Paul, 2021). According to Kanwal and Rehman (2017), the CFI value ranges from 0 to 1, with values greater than or equal to 0.90 indicating a satisfactory fit. The TLI is the improved version of the normed fit index (NFI) that assesses the structural model by comparing its chi-square value with that of the null or baseline model (Tucker & Lewis, 1973). It differs from the NFI in that it takes into account some level of model complexity, as it prefers simpler models (Dash & Paul, 2021). A TLI value of 0.90 or higher suggests an acceptable fit (Dash & Paul, 2021).

Furthermore, the IFI measures the fit of the structural model by adjusting the NFI for sample size and degrees of freedom (Bollen, 1989). An IFI value of 0.90 or higher is the recommended threshold (Elrehail, 2018). The RMSEA assesses how well optimum parameter estimates of the structural model would fit the covariance matrix of the population (Dash & Paul, 2021). An RMSEA value of 0.05 or less indicates good fit (Byrne, 2013). Finally, the SRMR is the square root of the distinction between the sample covariance matrix's residuals and the predicted covariance model (Cho et al., 2020). It is estimated by dividing the fitted residuals by the residual standard error (Dash & Paul, 2021). Its value spans from 0 to 1, and a value of 0.08 or less indicates an adequate fit (Chand & Fei, 2021).

Initially, the structural model for this study was not able to achieve a good fit. The IFI value was 0.883, the CFI value was 0.881 and the TLI value was 0.867, all below the acceptable value of 0.9. Similarly, the RMSEA value was 0.07, above the recommended threshold of 0.05. Only the chi-square/df and SRMR values were within the acceptable benchmark of 5 and 0.08, respectively. Hatcher and O'Rourke (2013) observed that most researchers usually face the challenge of obtaining a poor fit between the structural model and the data, which requires the structural model to be modified to achieve a good fit. For this study, the researcher relied on modification indices from the AMOS output to create covariance among error terms to improve the

structural model (see Abu-Al-Aish & Love, 2013). The modification indices proposed covariances between ATU3 and ATU4, PI3 and PI4, and SE1 and SE2. After these covariances were created, the structural model was able to achieve goodness of fit. Table 5.23 displays the results of the fit indices and the recommended thresholds of the modified structural model.

**Table 5.23: Results of the fit indices**

Fit indices	Recommended values	Values obtained
Chi-square/df	$\leq 3$	1.495
IFI	$\geq 0.90$	0.952
CFI	$\geq 0.90$	0.951
TLI	$\geq 0.90$	0.946
RMSEA	$\leq 0.05$	0.048
SRMR	$\leq 0.08$	0.050

As seen in Table 5.23, all fit indices employed to measure the goodness of fit of the structural model surpassed their respective recommended acceptability thresholds, as established by prior research. The results of the fit indices demonstrate that the modified structural model achieved data fit and was ready to test the hypothesised relationships.

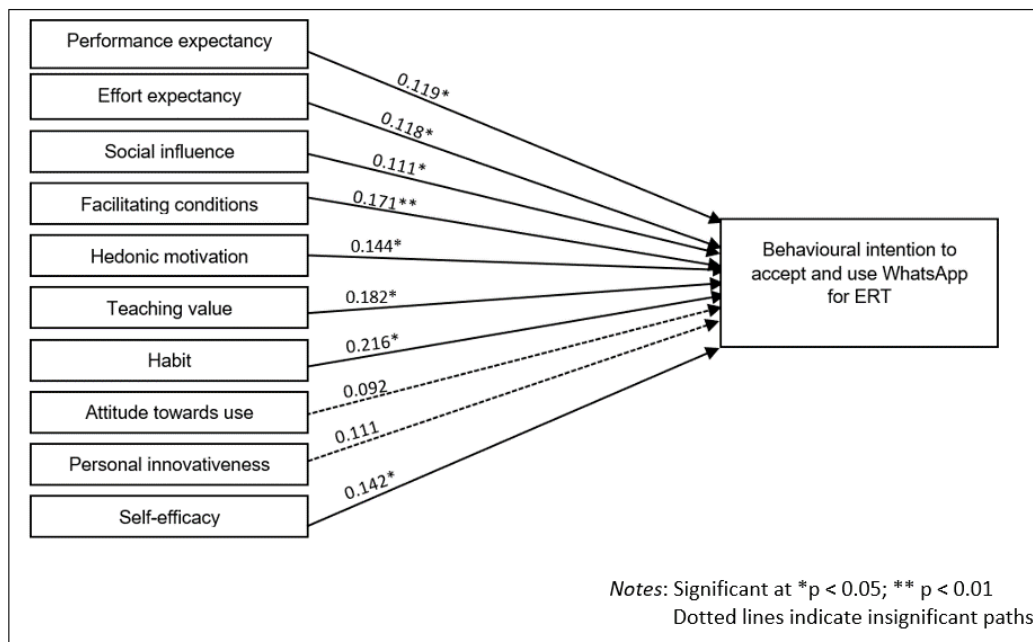
### 5.9.2.2 Hypotheses testing

The next step in the assessment of the structural model of this study was to test the stated hypotheses. The structural model for this study included performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness and self-efficacy as independent variables, and behavioural intention as a dependent variable. The hypothesised relationships were evaluated by assessing path coefficients and their significance. According to Shahbaz et al. (2018), path coefficients may be positive (+1), negative (-1) or zero (0). A coefficient of +1 indicates a strong positive relationship, 0 represents a weak or non-existent correlation and -1 denotes a strong negative correlation (Shahbaz et al., 2018).

The statistical significance of path coefficients is measured by their related p-values. P-values evaluate the significance level of path coefficients and indicate whether a relationship exists between the hypothesised relationships. A path coefficient is statistically significant if its p-value is equal to or less than 0.05 ( $p \leq 0.05$ ) (Dahiru, 2008). Schmidt and Osebold (2017) state that p-values of  $\leq 0.01$  and  $\leq 0.001$  denote very significant and highly significant, respectively. Therefore, the stated hypotheses for this study were supported when the standardised beta coefficients ( $\beta$ ) were positive and statistically significant.

The current study explored the influence of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on behavioural intention to accept and use WhatsApp for ERT. The study had 10 hypotheses, as stated in the introduction to this chapter as well as in Chapter 1. It is worth mentioning that the results of the hypotheses testing also addressed the main research question and research sub-questions 2, 3 and 4 of this study, as outlined in the introduction of this chapter as well as in Chapter 1. Therefore, this section starts by presenting the results of the hypotheses testing along with a discussion. Thereafter, the main research question and research sub-questions 2, 3 and 4 of the study are addressed.

Figure 5.4 shows the results of the path analysis of the proposed extension of the UTAUT2, showing significant and non-significant paths. As shown in Figure 5.4, the results of the path analysis of the proposed extension of the UTAUT2 show that eight out of the ten paths were significant.



**Figure 5.4: Results of path analysis of the proposed extension of the UTAUT2**

**H1: Performance expectancy influences behavioural intention to accept and use WhatsApp for ERT.**

The results of path analysis revealed that the influence of performance expectancy on behavioural intention to accept and use WhatsApp for ERT was positive and significant ( $\beta = 0.119$ ;  $p < 0.05$ ), supporting H1. Performance expectancies such as usefulness, quickness, promotion of teaching goals and enhancement of teaching productivity were the significant factors why secondary school teachers tended to accept and use WhatsApp for ERT. This finding explains that secondary school teachers with high performance expectancies were more inclined to accept and use WhatsApp for ERT than those with low performance expectancies. In other words, the result suggests that secondary school teachers who believed that using WhatsApp for ERT benefited them were more inclined to accept and use WhatsApp for ERT. This finding is understandable, because it is possible that secondary school teachers are utilitarian, meaning that their acceptance and use of WhatsApp for ERT are determined by the usefulness of WhatsApp for ERT. Mohammad-Salehi et al. (2021) point out that when teachers find a certain technology useful, they are more likely to accept and use that technology in teaching.

The result of this hypothesis testing supports the results of previous research in the context of online learning that performance expectancy influences teachers'

behavioural intentions to accept and use various ICT tools for teaching (Avci, 2022; Ismail et al., 2022; Kim & Lee, 2020; Mohammad-Salehi et al., 2021). For example, the result of this hypothesis is supported by Jevsikova et al. (2021), who investigated the factors influencing primary school teachers' behavioural intention to accept and use distance learning technologies in Lithuania and found that performance expectancy influenced primary school teachers' behavioural intention to accept and use distance learning technologies. Similarly, in North India, Sangeeta and Tandon (2021) found that performance expectancy influenced secondary school teachers' behavioural intention to adopt online teaching. Furthermore, the result of this study is in line with that of Murire and Cilliers (2017) in South Africa, who discovered that performance expectancy influenced university lecturers' behavioural intention to adopt social media for teaching and learning.

## **H2: Effort expectancy influences behavioural intention to accept and use WhatsApp for ERT.**

In this study, effort expectancy was found to have a positive and significant ( $\beta = 0.118$ ;  $p < 0.05$ ) influence on behavioural intention to accept and use WhatsApp for ERT, supporting H2. The easiness and effortlessness of using WhatsApp for ERT were the key aspects that led to secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. This finding means that secondary school teachers who believed that using WhatsApp for ERT was easy and effortless were more likely to accept and use WhatsApp for ERT. One possible reason for this finding could be that the easier and more effort-free it is for teachers to use ICT tools for teaching, the more willing they are to accept and use them for teaching (Ismail et al., 2022; Kim & Lee, 2020). This implies that if teachers find a particular ICT tool easy and effortless to use, they are more likely to accept and use that ICT tool for teaching. However, contradictory results have been reported in the literature regarding the influence of effort expectancy on teachers' behavioural intention to accept and use ICT tools for teaching.

For instance, the finding of this study is in contrast with the findings of studies conducted by Mohammad-Salehi et al. (2021) in Iran, Graham et al. (2020) in South Africa, Ma et al. (2022) in China and Holzmann et al. (2020) in Australia, who reported that effort expectancy had no influence on teachers' behavioural intention to accept

and use ICT tools for teaching. On the other hand, the result of the current study is similar to the results of the research undertaken by Omar et al. (2019) and Ismail et al. (2022) in Malaysia, who found that effort expectancy influenced secondary school teachers' behavioural intention to accept and use mobile technology for teaching. Similar results were also reported by Riady et al. (2022) in Indonesia that effort expectancy influenced school teachers' behavioural intention to use social media for remote teaching. Therefore, the current study reinforces that effort expectancy influences secondary school teachers' behavioural intention to accept and use WhatsApp for ERT.

### **H3: Social influence influences behavioural intention to accept and use WhatsApp for ERT.**

The results of the path analysis indicated that the influence of social influence on behavioural intention to accept and use WhatsApp for ERT was positive and significant ( $\beta = 0.111$ ;  $p < 0.05$ ); therefore, hypothesis H3 was supported. This finding indicates that secondary school teachers tended to accept and use WhatsApp for ERT when other significant people around them thought they should use WhatsApp for ERT. This implies that secondary school teachers believed that their colleagues, the school management, learners and parents of the learners could influence their behavioural intentions to accept and use WhatsApp for ERT. Ma et al. (2022) contend that teachers are more likely to accept and use a particular technology for teaching if that technology is being positively reinforced by the people who are important to them.

The potential reason for this finding could be that teachers in South Africa hold collectivist cultural values, which means they comply with the opinions of the people around them (Grobler, 2014). Srite and Karahanna (2006) posit that individuals who hold collectivistic cultural values are more likely to accept and use technology based on what their significant others think about it. Another possible explanation for this finding could be that teachers, school management, learners and parents of the learners form a unified community of practice (Mohammad-Salehi et al., 2021), which may influence teachers' behavioural intention to accept and use WhatsApp for ERT.

This finding corresponds with the findings of past studies that reported that social influence had a positive and significant influence on teachers' behavioural intention to accept and use ICT tools for teaching (Graham et al., 2020; Huang et al., 2019; Ma et



al., 2022; Shah et al., 2021). The finding of this study also corroborates the finding of a study done by Perera and Abeysekera (2022) in Sri Lanka, who found that teachers' behavioural intention to accept and use e-learning during the Covid-19 pandemic was influenced by social influence. In Iran, Mohammad-Salehi et al. (2021) discovered that social influence had a significant and positive influence on teachers' behavioural intention to use Web 2.0 technologies for teaching.

#### **H4: Facilitating conditions influence behavioural intention to accept and use WhatsApp for ERT.**

The results of the path analysis demonstrated that facilitating conditions positively and significantly ( $\beta = 0.171$ ;  $p < 0.01$ ) influenced behavioural intention to accept and use WhatsApp for ERT, thereby supporting H4. The availability of the resources, technical assistance and knowledge necessary for using WhatsApp for ERT and the similarities of WhatsApp with other digital tools used for ERT were the significant indicators that led to secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. This finding means that secondary school teachers tended to accept and use WhatsApp for ERT when they believed that the necessary resources and technical assistance were available to support the use of WhatsApp for ERT.

One plausible explanation for this finding could be that most teachers own smartphones and have access to the internet at home (Mtebe et al., 2016). This was evident during the Covid-19 pandemic, when WhatsApp was the most-used platform for ERT by teachers due to its popularity and availability (Amin & Sundari, 2020). Therefore, it may be concluded that teachers had the necessary resources, such as smartphones and access to the internet, to use WhatsApp for ERT. Another possible explanation for this finding could be that many schools in South Africa have staff WhatsApp groups, which serve as an online community of practice for teachers to assist one another when faced with challenges relating to teaching and learning (Ajani, 2021). Riady et al. (2022) observed that the more teachers receive the necessary support and help from their colleagues while using technology for teaching, the more they are willing to accept and use such technology for teaching.

The finding of this study is congruent with the findings of past research that reported that facilitating conditions had a significant and positive influence on teachers' behavioural intention to accept and use ICT tool for teaching (Ma et al., 2022; Mtebe

et al., 2016; Oye et al., 2011; Sangeeta & Tandon, 2021; Wijaya et al., 2022). The same finding was also made by a study conducted by Mutisya (2020) in Kenya, where facilitating conditions positively and significantly influenced primary school teachers' behavioural intention to accept and use ICT in teaching and learning. In addition, the finding of the present study also confirms the finding of Moonsamy and Govender (2018) in South Africa, who discovered that facilitating conditions had a positive and significant impact on university lecturers' behavioural intention to accept and use LMSs.

#### **H5: Hedonic motivation influences behavioural intention to accept and use WhatsApp for ERT.**

The analysis of the hypothetical relationship between hedonic motivation and behavioural intention to accept and use WhatsApp for ERT revealed a positive and significant result ( $\beta = 0.144$ ;  $p < 0.05$ ); therefore, H5 was supported. This finding explains that secondary school teachers had a tendency to accept and use WhatsApp for ERT if they derived fun and enjoyment from using WhatsApp for ERT. Tseng et al. (2019) state that hedonic motivation may have a significant influence on teachers' behavioural intentions if using technology for teaching is hedonic. Several studies have reported that WhatsApp makes teaching more fun and enjoyable (Çetinkaya, 2020; Jasrial, 2019; Mulenga & Marbán, 2020; Nashir & Laili, 2021). In addition, WhatsApp has fun and interesting emojis, stickers and graphics interchange formats (GIFs) that users may use to convey a particular message or represent their feelings in chatting (Jasrial, 2019). Therefore, it is possible that secondary school teachers experienced fun and enjoyment while using the emojis, stickers and GIFs to convey a particular message to learners during ERT, which in turn influenced their behavioural intentions to accept and use WhatsApp for ERT.

This finding is in line with the previous finding of a study by Omar et al. (2019) in Malaysia, who reported that hedonic motivation had a positive and significant influence on secondary school teachers' behavioural intentions to adopt mobile technology for teaching. This finding is also concurrent with the finding of Goto et al. (2021) in South Africa, who revealed that hedonic motivation positively and significantly affected pre-service teachers' behavioural intentions to accept and use online formative feedback. Furthermore, the finding of this study was similar to the finding of Zhou et al. (2022) in

China, who discovered a positive and significant relation between hedonic motivation and teachers' behavioural intentions to use an interactive whiteboard for teaching.

**H6: Teaching value influences behavioural intention to accept and use WhatsApp for ERT.**

The path analysis for H6 produced a positive and significant ( $\beta = 0.182$ ;  $p < 0.05$ ) relation between teaching value and behavioural intention to accept and use WhatsApp for ERT, hence H6 was supported. This finding was interesting considering that teaching value was a new construct introduced by this study to replace the construct of price value in the original UTAUT2. The values of worthiness, flexibility, quickness and accomplishment of teaching objectives were the main indicators that influenced secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT.

This finding shows that when secondary school teachers spent more time and effort on using WhatsApp for ERT, they were more inclined to accept and use WhatsApp for ERT. The reasonable justification for this finding could be that during the Covid-19 pandemic, most teachers were new to online teaching, and as a result, they spent more time getting used to the online teaching environment and coming up with ways to engage learners (Scull et al., 2020). Another reasonable justification for this finding could be that most teachers in South Africa believe in and recognise the value that ICT brings to their teaching (Ndebele & Mbodila, 2022).

The finding of the current study confirms the finding of Dajani and Hegleh (2019) in Jordan, who replaced price value with learning value and found that learning value had a significant and positive impact on students' behavioural intentions to use animation. In addition, the finding of the current research is in conformity with the finding of Prasetyo et al. (2021) in the Philippines, who also replaced price value with learning value and reported that learning value was positively and significantly related to students' behavioural intentions to use online learning platforms. Furthermore, Ain et al. (2015) in Malaysia also found a positive and significant relationship between learning value and students' behavioural intention to use LMSs for learning.

**H7: Habit influences behavioural intention to accept and use WhatsApp for ERT.**

The analysis of the hypothesised association between habit and behavioural intention to accept and use WhatsApp for ERT produced a positive and significant result ( $\beta = 0.217$ ;  $p < 0.05$ ), supporting H7. The finding for habit in this study shows that secondary school teachers tended to accept and use WhatsApp for ERT when they used WhatsApp for ERT voluntarily. This could be attributed to the fact that WhatsApp is an addictive communication tool (Yilmazsoy et al., 2020). Therefore, it is possible that secondary school teachers may have developed habitual behaviours of using WhatsApp for ERT, which in turn influenced their intentions to accept and use WhatsApp for ERT.

The finding of habit in this study supports the findings of studies investigating the determinants of teachers' behavioural intentions to accept and use mobile technology for teaching and found that habit had a positive and significant influence on behavioural intention (Hu et al., 2020; Ismail et al., 2022; Omar et al., 2019). In addition, the finding of the present research corroborates the results of a research study conducted by Avcı (2022) in Malaysia, who examined the elements that have an impact on teachers' use of digital learning resources and discovered that habit had a positive and significant impact on teachers' behavioural intention to use digital learning resources. Similarly, in China, Zhou et al. (2022) probed the factors affecting teachers' behavioural intention to use an interactive whiteboard for teaching and reported that habit had a positive and significant influence on behavioural intentions to use an interactive whiteboard for teaching.

#### **H8: Attitude towards use influences behavioural intention to accept and use WhatsApp for ERT.**

The results of the path analysis indicated that the influence of attitude towards use on behavioural intention to accept and use WhatsApp for ERT was positive but insignificant ( $\beta = 0.092$ ;  $p = 0.092$ ); hence, H8 was not supported. This means that secondary school teachers' attitude towards using WhatsApp for ERT did not significantly influence their willingness to accept and use WhatsApp for ERT. This result was unexpected, considering that secondary school teachers had a positive attitude towards using WhatsApp for ERT. This shows that the fact that secondary school teachers had a positive attitude towards using WhatsApp for ERT does not necessarily mean that they intended to accept and use WhatsApp for ERT in the

future. The reason underpinning this finding could be the presence of the constructs of performance expectancy and effort expectancy. Venkatesh et al. (2003) explain that the construct of attitude towards use is only significant when the constructs of performance expectancy and effort expectancy are not included. They further indicate that the relation between attitude towards use and behavioural intention is spurious when performance expectancy and effort expectancy are included (Venkatesh et al., 2003). Hence, they excluded the construct of attitude towards use in the original UTAUT.

Past studies have reported different results regarding the influence of attitude towards use on behavioural intention in the presence of performance expectancy and effort expectancy. Supporting the finding of this study, several studies incorporating performance expectancy and effort expectancy reported that attitude towards use had an insignificant influence on behavioural intention (Taylor & Todd, 1995; Thompson et al., 1991; Venkatesh et al., 2003). In addition, Siswanto et al. (2018) also reported an insignificant influence of attitude towards use on behavioural intention when performance expectancy and effort expectancy are included. Conversely, the finding of this study is inconsistent with other studies that found a significant relationship between attitude towards use and behavioural intention in the presence of performance expectancy and effort expectancy (Huettermann et al., 2021; Jairak et al., 2009; Mosunmola et al., 2018; Nassuora, 2013; Thomas et al., 2013; Zamzami & Putra, 2019). Moreover, the current study reinforces that attitude towards use does not significantly influence behavioural intention when performance expectancy and effort expectancy are present.

#### **H9: Personal innovativeness influences behavioural intention to accept and use WhatsApp for ERT.**

The path analysis for H9 revealed that personal innovativeness had a positive but insignificant influence ( $\beta = 0.111$ ;  $p = 0.058$ ) on behavioural intention to accept and use WhatsApp for ERT; therefore, H9 was not supported. This result was somewhat surprising, as secondary school teachers indicated that they found innovation in using WhatsApp for ERT. The fact that secondary school teachers indicated high levels of personal innovativeness in using WhatsApp for ERT, which had no influence on their behavioural intention to accept and use WhatsApp for ERT, demonstrates the

intricacies of human behaviour towards accepting and using new technology (Motshegwe & Batane, 2015). This finding demonstrates that secondary school teachers' levels of innovativeness in using WhatsApp for ERT did not play a significant role in their willingness to accept and use WhatsApp for ERT. In other words, the indicators of personal innovativeness were insignificant in influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT.

The plausible explanation for the insignificant influence of personal innovativeness on behavioural intention to accept and use WhatsApp for ERT would be that the majority (71.2%) of the secondary school teachers in this study were 40 or older, and personal innovativeness often significantly influences the behavioural intentions of young teachers, as their technological preferences are yet to be shaped (Nikolopoulou et al., 2021). Another reason for personal innovativeness not having a significant influence on behavioural intention to accept and use WhatsApp for ERT may be secondary school teachers' level of experience in using WhatsApp for ERT. It can be noted that the majority (76.8%) of the secondary school teachers in this study had more than one year of experience using WhatsApp for ERT, and the relation between personal innovativeness and behavioural intention is stronger during the early stages of technology use (Abu-Al-Aish & Love, 2013). Consequently, it may be argued that the influence of personal innovativeness on behavioural intention to accept and use WhatsApp for ERT would have been significant during the first year of using WhatsApp for ERT.

Previous studies conducted on various ICT tools have reported contradictory findings concerning the influence of personal innovativeness on teachers' behavioural intentions. For example, the finding of this study does not correspond with the findings of Gunasinghe et al. (2018), Khlaisang et al. (2021), Waris et al. (2022) and Kuang et al. (2022), who reported that personal innovativeness had a significant influence on teachers' behavioural intentions. In contrast, the finding of this study bears similarities with the findings of Amid and Din (2021), Handoko (2019), Jameel (2021) and Twum et al. (2021), who found that personal innovativeness had an insignificant influence on behavioural intention. Therefore, the present research reinforces that in the context of using WhatsApp for ERT, personal innovativeness has an insignificant influence on teachers' behavioural intention to accept and use WhatsApp for ERT.

#### **H10: Self-efficacy influences behavioural intention to accept and use WhatsApp for ERT.**

Finally, the path analysis demonstrated that self-efficacy positively and significantly ( $\beta = 0.142$ ;  $p < 0.05$ ) influenced behavioural intention to accept and use WhatsApp for ERT, supporting H10. One possible interpretation of this finding is that secondary school teachers are more likely to accept and use WhatsApp for ERT if they have confidence in their ability to use WhatsApp for ERT. The plausible explanation for this finding could be the positive impact of the Covid-19 pandemic on teachers' self-efficacy in using ICT tools for teaching. Dindar et al. (2021) argue that the pandemic has forced teachers worldwide to use various ICT tools for ERT regardless of their desire. Therefore, it is likely that the pandemic might have improved secondary school teachers' self-efficacy in using WhatsApp for ERT, which in turn has influenced their intentions to accept and use WhatsApp for ERT.

Furthermore, the finding could also be attributed to secondary school teachers' frequent use of WhatsApp for communicating with learners (Zan, 2019), which might have improved their confidence in using WhatsApp for ERT and in turn influenced their behavioural intentions to accept and use WhatsApp for ERT. Supporting this view, Liu et al. (2017) revealed that teachers' frequent use of technology increases their confidence in using it for teaching. The dimension of self-efficacy has been widely examined in technology acceptance research in the domain of online education, and its influence on behavioural intention was found to be significant by most studies (Al Kurdi et al., 2020; Budu et al., 2018; Revyathi & Tselios, 2019; Siron et al., 2020), thereby correlating with the finding of the present study.

The finding of this study also correlates with the findings of studies investigating the factors influencing teachers' behavioural intentions to accept and use LMSs for teaching, which found that self-efficacy had a significant impact on teachers' behavioural intentions to accept and use LMSs for teaching (Balkaya & Akkucuk, 2021; Lavidas et al., 2022). The finding of the current study further supports the findings of studies by Kim and Park (2018) and Usman et al. (2022) in Indonesia, who discovered that self-efficacy had a significant impact on teachers' behavioural intentions to use online learning technology. Similarly, in China, Teo et al. (2018)

reported that self-efficacy had a significant influence on teachers' behavioural intentions to use technology for teaching.

#### *5.9.2.2.1 Addressing the main research question*

The main research question of this study was: What factors influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

This section addresses the main research question of the study. This research question was addressed by the results of hypotheses testing. The results of the hypotheses testing demonstrated that eight out of ten of the stated hypotheses were supported by the data for this study. The results of hypotheses testing revealed that performance expectancy ( $\beta = 0.119$ ;  $p < 0.05$ ), effort expectancy ( $\beta = 0.118$ ;  $p < 0.05$ ), social influence ( $\beta = 0.111$ ;  $p < 0.05$ ), facilitating conditions ( $\beta = 0.171$ ;  $p < 0.01$ ), hedonic motivation ( $\beta = 0.144$ ;  $p < 0.05$ ), teaching value ( $\beta = 0.182$ ;  $p < 0.05$ ), habit ( $\beta = 0.217$ ;  $p < 0.05$ ) and self-efficacy ( $\beta = 0.142$ ;  $p < 0.05$ ) influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT, supporting H1, H2, H3, H4, H5, H6, H7 and H10. This implies that eight factors influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy.

This finding demonstrates that secondary school teachers in the Namakgale Circuit will intend to accept and use WhatsApp for ERT if using WhatsApp for ERT is beneficial, easy and effortless, fun and enjoyable, and habitual for them. Furthermore, secondary school teachers will intend to accept and use WhatsApp for ERT when they believe that their important others think they should use WhatsApp for ERT, if organisational resources and technical support are available, and if they find innovation in using WhatsApp for ERT. In addition, the finding shows that secondary school teachers are more likely to accept and use WhatsApp for ERT if they spend more time and effort on using WhatsApp for ERT, have a positive attitude towards using WhatsApp, and are confident in their ability to use WhatsApp for ERT.

#### *5.9.2.2.2 Addressing research sub-question 2*



Research sub-question 2 was formulated as follows: What is the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The results of the hypotheses testing addressed research sub-question 2 of the current study. The results of the hypotheses testing demonstrated that the influence of performance expectancy ( $\beta = 0.119$ ;  $p < 0.05$ ), effort expectancy ( $\beta = 0.118$ ;  $p < 0.05$ ), social influence ( $\beta = 0.111$ ;  $p < 0.05$ ), facilitating conditions ( $\beta = 0.171$ ;  $p < 0.01$ ) and hedonic motivation ( $\beta = 0.144$ ;  $p < 0.05$ ) was positive and significant on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

#### *5.9.2.2.3 Addressing research sub-question 3*

Research sub-question 3 was formulated as follows: What is the influence of teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The results of the hypotheses testing also addressed research sub-question 3 of the present study. The results of the hypotheses testing revealed that the influence of teaching value ( $\beta = 0.182$ ;  $p < 0.05$ ), habit ( $\beta = 0.217$ ;  $p < 0.05$ ) and self-efficacy ( $\beta = 0.142$ ;  $p < 0.05$ ) was positive and significant on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit. Meanwhile, the influence of attitude towards use ( $\beta = 0.092$ ;  $p = 0.092$ ) and personal innovativeness ( $\beta = 0.111$ ;  $p = 0.058$ ) was positive but insignificant on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

#### *5.9.2.2.4 Addressing research sub-question 4*

Research sub-question 4 was formulated as follows: Which factor can best predict secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

Finally, the results of testing the hypotheses addressed research sub-question 4 of this study. This research question was addressed by identifying the factor that had the

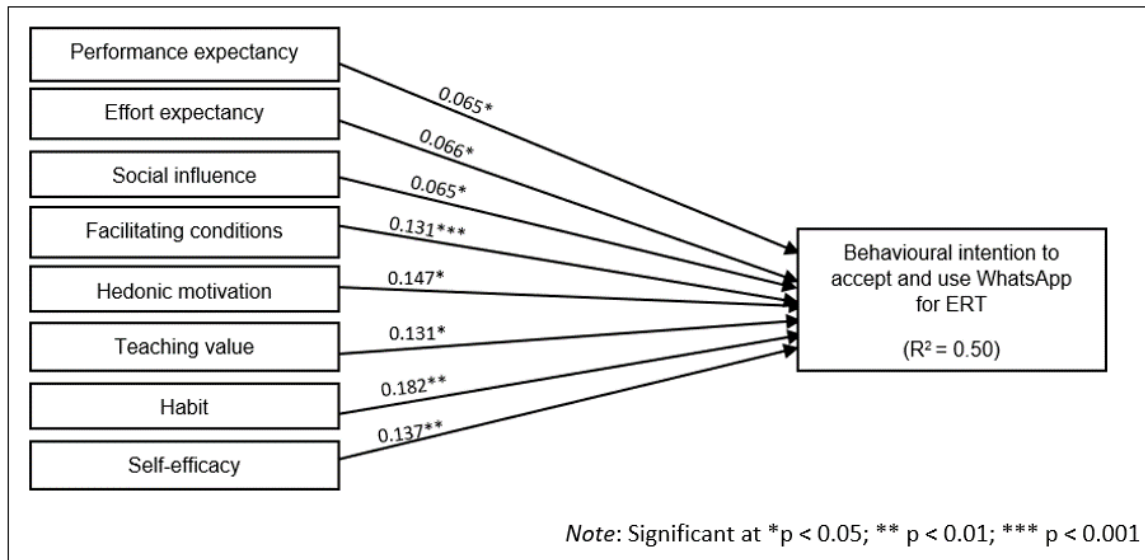
highest standardised beta path coefficient ( $\beta$ ) among all the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. As depicted in Figure 5.4, among all the factors that significantly influenced behavioural intention to accept and use WhatsApp for ERT, habit was the factor with the highest standardised beta path coefficient ( $\beta = 0.216$ ), thereby making it the best factor that can predict secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit. This means that secondary school teachers' behavioural intention to accept and use WhatsApp for ERT was mainly influenced by habit. This also implies that habit was the strongest predictor of behavioural intention to accept and use WhatsApp for ERT.

This finding was interesting, considering that the original UTAUT2 found that performance expectancy was the strongest predictor of behavioural intention (Venkatesh et al., 2012). In addition, past UTAUT2 studies conducted on different ICT tools also demonstrated that performance expectancy is the best factor predicting teachers' behavioural intentions (Bower et al., 2020; Tseng et al., 2019). This finding is consistent with the findings of previous studies that found habit as the best predictor of teachers' behavioural intention (Ismail et al., 2022; Omar et al., 2019). Furthermore, this finding agrees with the finding of a study conducted by Avcı (2022) in Malaysia, who reported that habit was the best predictor of teachers' behavioural intentions to use digital learning resources. In addition, the same finding was revealed by research conducted by Nikolopoulou et al. (2021) in Greece, who found that habit was the best predictor of primary and secondary school teachers' behavioural intentions to use mobile internet for teaching. Similarly, in China, Hu et al. (2020) found that habit was the best predictor of university lecturers' behavioural intention to adopt mobile technology for teaching.

### *5.9.2.3 Final proposed extension of the UTAUT2*

Initially, the proposed extension of the UTAUT2 included the constructs of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness and self-efficacy as predictors of behavioural intention to accept and use WhatsApp for ERT. Unfortunately, the constructs of attitude towards use and personal innovativeness were found to be insignificant predictors of behavioural

intention to accept and use WhatsApp for ERT. Consequently, these insignificant predictors of behavioural intention to accept and use WhatsApp for ERT were eliminated and the final proposed extension of the UTAUT2 and the structural model were re-estimated, as recommended by Venkatesh et al. (2003). Figure 5.5 represents the final proposed extension of the UTAUT2 with standardised loadings.



**Figure 5.5: Final proposed extension of UTAUT2 with standardised beta coefficients and coefficient of determination ( $R^2$ )**

As shown in Figure 5.5, the final extended UTAUT2 consists of eight significant predictors of behavioural intention to accept and use WhatsApp for ERT, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy. This final proposed extension of the UTAUT2 may be used to investigate the factors influencing teachers' behavioural intentions to accept and use WhatsApp for ERT in different countries and cultural contexts.

#### 5.9.2.4 Explanatory power of the final proposed extension of the UTAUT2

In this study, the last step in the assessment of the structural model involved evaluating the coefficient of determination ( $R^2$ ) of the independent variables on the dependent variable.  $R^2$  measures the structural model's explanatory power, also known as 'in-sample predictive power', and it reflects the variation explained by the independent variable on the dependent variable (Hair et al., 2021). It is based on the number of predictor constructs in the structural model; therefore, the more predictor constructs in

the structural model, the higher the value of  $R^2$  will be (Hair et al., 2021).  $R^2$  values range from 0 to 1, with a value closer to 1 suggesting a higher explanatory power (Hair et al., 2021). There is no general threshold for an acceptable  $R^2$  value, as acceptable  $R^2$  values depend on the context of the research. For example, in social science research, an  $R^2$  value of 0.25 is regarded as weak, 0.50 as moderate and 0.75 as substantial (Hair et al., 2011). In business research, an  $R^2$  value of 0.19 is considered low, 0.33 is considered moderate and 0.67 is considered high (Chin, 1998). In financial research, an  $R^2$  value of 0.10 is regarded as satisfactory (Raithel et al., 2012). Hair et al. (2021) emphasise that the  $R^2$  values should always be assessed in the context of the research and in comparison to the  $R^2$  values from comparable studies as well as theories or models with a similar level of complexity.

As shown in Figure 5.5, the  $R^2$  value for behavioural intention was 0.50. This indicates that 50% of the variance in behavioural intention was accounted by performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy. Considering Hair et al.'s (2011) criteria for an acceptable  $R^2$  value in social science research, it may be concluded that the extended UTAUT2 explained a moderate portion (50%) of the variance in behavioural intention to accept and use WhatsApp for ERT. In other words, the endogenous constructs of the extended UTAUT2 exhibited a moderate explanatory power, thereby confirming the stability and robustness of the extended UTAUT2 in explaining secondary school teachers' behavioural intention to accept and use WhatsApp for ERT.

It is also important to note that the extended UTAUT2 of this study could only account for 50% of the variance in behavioural intention, leaving the remaining 50% unexplained. Therefore, the unexplained 50% of the variance indicates that other important independent constructs that are beyond the scope of the present research may be added to the extended UTAUT2 to enhance the explanatory power for behavioural intention to accept and use WhatsApp for ERT. Moreover, the 50% of the variance in behavioural intention to accept and use WhatsApp for ERT was higher than the 40.2% of the variance in secondary school teachers' behavioural intention to accept and use multimedia-enhanced content that was reported by a UTAUT2 study conducted by Mtebe et al. (2016) in Tanzania.

## 5.10 SUMMARY

The current study extended the UTAUT2 to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. This chapter focused on the analysis, presentation and discussion of the research results. An online anonymous questionnaire was used to collect data from teachers from seven secondary schools in the Namakgale Circuit. A convenient sample of 215 secondary school teachers completed the online anonymous questionnaire. This sample size was considered sufficient for CB-SEM analysis. Data were analysed statistically by performing descriptive and CB-SEM analyses using SPSS and AMOS version 28. Prior to data analyses, the collected data were assessed for common method bias using Harman's single-factor test and the results demonstrated that the data were free from common method bias. In addition, the data were screened and cleaned to address the requirement of performing CB-SEM analysis, including the assessment of unengaged responses, missing data, outliers, multicollinearity and normality. The process of data screening and cleaning demonstrated that the collected data did not violate the requirement for performing CB-SEM analysis.

Descriptive statistics using frequency tables and graphs were used to present the results from the online questionnaire. In addition, all the constructs of the extended UTAUT2 achieved internal consistency and reliability. The analysis of the results on the level of acceptance and use of WhatsApp for ERT revealed that secondary school teachers had a high level of acceptance and use of WhatsApp for ERT, with a mean value of 3.97. Furthermore, the results of the KMO measure of sampling adequacy and Bartlett's test of sphericity confirmed that the data were suitable for factor analysis. Furthermore, the results of the skewness and kurtosis tests suggested that the data were normally distributed. The analysis of the data using the CB-SEM method involved two stages: firstly, the assessment of the measurement model, and secondly, the assessment of the structural model. The results of the measurement model demonstrated that the data achieved construct validity.

The results of the goodness of fit showed that the data fit with the structural model. The results of the hypotheses testing revealed that eight of the ten hypotheses were supported by the data. The results of testing the hypotheses revealed that

performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy had a positive and significant influence on behavioural intention to accept and use WhatsApp for ERT. Attitude towards use and personal innovativeness had a positive but insignificant influence on behavioural intention to accept and use WhatsApp for ERT. The best predictor of behavioural intention to accept and use WhatsApp for ERT was habit. Finally, the proposed extension of the UTAUT2 was revised to provide a final extension of the UTAUT2 that offers a more simplified framework for researching the elements that have an impact on the behavioural intention of secondary school teachers to accept and use WhatsApp for ERT. The final proposed extension of the UTAUT2 had a notable explanatory power of 50% in predicting behavioural intention to accept and use WhatsApp for ERT. The chapter that follows presents an overview, a synopsis of the key research results, contributions, limitations and delimitations of the study, and recommendations for future research.

## CHAPTER 6

### CONCLUSION AND RECOMMENDATIONS

#### 6.1 INTRODUCTION

In the preceding chapter, the research results of the current study were presented and discussed. The aim of the present study was to investigate the factors influencing secondary schools' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit. The study extended Venkatesh et al.'s (2012) UTAUT2 to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit. The extended UTAUT2 included 11 constructs, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention. To achieve the aim of the study, the following objectives were set:

1. To assess the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit
2. To explore the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit
3. To explore the influence of teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit
4. To determine the factor that best predicts secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

The present study achieved its aim and objectives by addressing the research questions and confirming the stated research hypotheses. The following main research question guided this study: What factors influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The following research sub-questions guided this study, emanating from the main research question:

1. What is the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit?
2. What is the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?
3. What is the influence of teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?
4. Which factor can best predict secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The following hypotheses were formulated:

**H1:** Performance expectancy influences behavioural intention to accept and use WhatsApp for ERT.

**H2:** Effort expectancy influences behavioural intention to accept and use WhatsApp for ERT.

**H3:** Social influence influences behavioural intention to accept and use WhatsApp for ERT.

**H4:** Facilitating conditions influence behavioural intention to accept and use WhatsApp for ERT.

**H5:** Hedonic motivation influences behavioural intention to accept and use WhatsApp for ERT.

**H6:** Teaching value influences behavioural intention to accept and use WhatsApp for ERT.

**H7:** Habit influences behavioural intention to accept and use WhatsApp for ERT.

**H8:** Attitude towards use influences behavioural intention to accept and use WhatsApp for ERT.

**H9:** Personal innovativeness influences behavioural intention to accept and use WhatsApp for ERT.



**H10:** Self-efficacy influences behavioural intention to accept and use WhatsApp for ERT.

This study successfully addressed the research questions, confirmed the hypotheses and achieved the aim and objectives of the study. The goal of this final chapter is to provide an overview, a summary of the key research results, contributions, practical implications, limitations of the study, suggestions for future research as well as concluding remarks. Sampson (2017) asserts that the goal of the final chapter of a thesis is to highlight significant parts of the knowledge emerging from the research, discuss the study's contributions to the available literature and provide directions for future work. Ogbodo-Nathaniel (2022) states that the final chapter of a thesis aims to remind or refresh the reader's memory about the significant points resulting from the research.

## **6.2 OVERVIEW OF THE RESEARCH**

This section provides an overview of the preceding chapters of this study.

Chapter 1 provided the introduction and background to the study. It described the background to the context of the study, the rationale for the study, the problem statement, the research questions, the aim and objectives, and the research hypotheses and assumptions of the study. The chapter also provided a preliminary literature review, a brief introduction to the theoretical framework, and the research methodology and design adopted in this study, including the research paradigm, research approach, research design, population and sampling, data collection instrument, as well as data analysis and interpretation. In addition, the chapter offered an overview of the reliability and validity, ethical considerations and the study's limitations and delimitations. Finally, the chapter provided definitions of key concepts, followed by the organisation of the chapters of the thesis.

Chapter 2 provided a discussion of the theoretical framework underpinning the study. It started by reviewing the dominant models and theories of technology acceptance and their limitations. The models and theories included the TRA (Fishbein & Ajzen, 1975), TPB (Ajzen, 1991), TAM (Davis et al., 1989), C-TAM-TPB (Taylor & Todd, 1995), MM (Davis et al., 1992), MPCU (Thompson et al., 1991), SCT (Bandura, 1986), IDT (Rogers, 1995), UTAUT (Venkatesh et al., 2003) and UTAUT2 (Venkatesh et al., 2012). Among these models and theories of technology acceptance, the UTAUT2 was

chosen as a theoretical basis for the study. The chapter also provided justifications for choosing the UTAUT2 as a theoretical lens for the present study. In addition, an extensive review of the literature on studies applying the UTAUT2 was also provided. Finally, the proposed extension of the UTAUT2 was presented.

Chapter 3 presented an extensive review of the existing literature and studies related to the research problem. It began by laying the foundation by providing a brief background on ERT to enhance understanding of the concept. The chapter also provided a discussion of the various initiatives established by both developing and developed countries during the Covid-19 pandemic to support ERT implementation in schools and the challenges experienced by teachers during the transition to ERT. Furthermore, the chapter examined the benefits of ERT for teachers, the educational affordances of WhatsApp, as well as the benefits and drawbacks of using WhatsApp for ERT for teachers. Finally, the chapter provided an intensive review of existing literature on the factors that might influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT, including performance expectancy, effort expectancy, social influence, facilitation conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness and self-efficacy.

In Chapter 4, the research design and methodology used to conduct the current research, as well as why they were chosen, were explained in detail. The chapter described in detail the positivism research paradigm, quantitative research approach, survey research design, population, convenience sampling procedure, anonymous online questionnaire and statistical analysis procedures employed in the study and why they were chosen. The chapter also explained in detail the various measures taken to ensure the validity and reliability of the questionnaire. In addition, the chapter explained in detail the ethical considerations considered when conducting the study, including permission to conduct the research, informed consent, voluntary participation, confidentiality and anonymity.

Chapter 5 presented the research results concurrently with the discussions. A convenience sample of 215 teachers from seven secondary schools in the Namakgale Circuit completed the anonymous online questionnaire. The SPSS version 28 and AMOS version 28 software were used to perform the descriptive and CB-SEM analyses, respectively, to address the research questions and test the stated

hypotheses. The results revealed that secondary school teachers in the Namakgale Circuit have a high level of acceptance and use of WhatsApp for ERT. In addition, the results of hypotheses testing demonstrated that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy had a positive and significant influence on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. Among all these factors, habit was the best factor in predicting secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. Furthermore, the results revealed that attitude towards use and personal innovativeness had a positive but insignificant influence on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. Due to the non-significant paths of the influence of attitude towards use and personal innovativeness on behavioural intention to accept and use WhatsApp for ERT, the initial proposed extension of the UTAUT2 was modified by removing these insignificant paths, and a final extension of the UTAUT2 was presented. The final proposed extension of the UTAUT2 explained 50% of the variance in behavioural intention to accept and use WhatsApp for ERT.

### **6.3 SUMMARY OF KEY RESEARCH RESULTS**

This section presents a summary of the key results of the current study. The summary of the key results is presented in relation to the results of the hypotheses and research questions.

#### **6.3.1 Hypotheses testing**

This study had 10 research hypotheses. CB-SEM using AMOS version 28 was used to test the hypothesised relationships. The hypothesised relationships were evaluated by assessing standardised beta coefficients and their statistical significance. All hypotheses were evaluated with a 5% error margin, meaning that relations between variables were deemed statistically significant when the p-value was less than or equal to 0.05 ( $p \leq 0.05$ ). Table 6.1 presents a summary of the results of hypotheses testing.

**Table 6.1: Summary of the results of hypotheses testing**

Hypothesis	Path	Standardised beta coefficient ( $\beta$ )	p-value	Result
H1	PE→BI	0.119	0.028	Supported
H2	EE→BI	0.118	0.030	Supported
H3	SI→BI	0.111	0.048	Supported
H4	FC→BI	0.171	0.003	Supported
H5	HM→BI	0.144	0.044	Supported
H6	TV→BI	0.182	0.015	Supported
H7	H→BI	0.216	0.017	Supported
H8	ATU→BI	0.092	0.092	Not supported
H9	PI→BI	0.111	0.058	Not supported
H10	S→BI	0.142	0.011	Supported

As displayed in Table 6.1, the results of hypotheses testing showed that performance expectancy ( $\beta = 0.119$ ;  $p < 0.05$ ), effort expectancy ( $\beta = 0.118$ ;  $p < 0.05$ ), social influence ( $\beta = 0.111$ ;  $p < 0.05$ ), facilitating conditions ( $\beta = 0.171$ ;  $p < 0.01$ ), hedonic motivation ( $\beta = 0.144$ ;  $p < 0.05$ ), teaching value ( $\beta = 0.182$ ;  $p < 0.05$ ), habit ( $\beta = 0.216$ ;  $p < 0.05$ ) and self-efficacy ( $\beta = 0.142$ ;  $p < 0.05$ ) had a positive and significant influence on behavioural intention to accept and use WhatsApp for ERT, supporting H1, H2, H3, H4, H5, H6, H7 and H10. The results of hypotheses testing also demonstrated that attitude towards use ( $\beta = 0.092$ ;  $p = 0.092$ ) and personal innovativeness ( $\beta = 0.111$ ;  $p = 0.058$ ) had a positive but insignificant influence on behavioural intention to accept and use WhatsApp for ERT, hence H8 and H9 were not supported. Overall, eight out of the ten hypothesised relationships were supported by the data.

### 6.3.2 Main research question

The main research question was: What factors influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

This research question was addressed by the results of the hypotheses testing. The results of the hypotheses testing showed that eight hypothesised relations between performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, self-efficacy and behavioural intention to accept and use WhatsApp for ERT were supported. Therefore, the present study concluded that eight factors influenced secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy.

### 6.3.3 Research sub-question 1

Research sub-question 1 was: What is the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit?

The level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit was assessed by computing the mean values for all the constructs of the extended UTAUT2 and the overall mean value using SPSS version 28. The results indicated that effort expectancy ( $M = 3.77$ ), social influence ( $M = 3.80$ ), facilitating conditions ( $M = 3.83$ ), hedonic motivation ( $M = 4.06$ ), teaching value ( $M = 3.95$ ), habit ( $M = 4.16$ ), attitude towards use ( $M = 4.19$ ), personal innovativeness ( $M = 4.09$ ), self-efficacy ( $M = 3.96$ ) and behavioural intention ( $M = 4.35$ ) all produced mean values greater than 3.67, which demonstrates a high level of acceptance and use of WhatsApp for ERT. Only performance expectancy produced a mean value of 3.58, which denotes a moderate level of acceptance and use of WhatsApp for ERT. In addition, the overall mean value was 3.97, which represents a high level of acceptance and use of WhatsApp for ERT. Therefore, it was concluded that the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit was high.

### 6.3.4 Research sub-question 2

Research sub-question 2 was: What is the influence of performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The results of the hypotheses testing addressed this research question. Performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation were found to have a positive and significant influence on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

#### 6.3.5 Research sub-question 3

Research sub-question 3 was: What is the influence of teaching value, habit, attitude towards use, personal innovativeness and self-efficacy on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The results of the hypotheses testing addressed this research question. Teaching value, habit and self-efficacy were found to have a positive and significant influence on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit. In addition, the results of hypotheses testing demonstrated that attitude towards use and personal innovativeness had a positive but non-significant influence on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

#### 6.3.6 Research sub-question 4

Research sub-question 4 was: Which factor can best predict secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit?

The standardised beta path coefficients for all the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit were analysed to answer this research question. The factor with the highest standardised beta path coefficient was considered the best factor influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit. The path analysis results showed that habit, with the highest standardised path coefficient of 0.216, was the best predictor of secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit.

### **6.4 CONTRIBUTIONS OF THE STUDY**

The current study makes important contributions to the understanding of the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT, including contributions to theory and methodology. This section outlines the theoretical and methodological contributions of the study.

#### 6.4.1 Contributions to theory

The results of this study provide numerous significant theoretical contributions. Firstly, there is a paucity of research on the factors influencing teachers' behavioural intention to accept and use social media platforms for teaching in South Africa (Cilliers et al., 2017). In addition, the available research on the elements that have an impact on the behavioural intention to accept and use ICT tools in education focused mainly on students in higher education institutions (Alghizzawi et al., 2019). To the best of the researcher's knowledge, this is the first study to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the context of South Africa. Therefore, this study makes a significant contribution to the understanding of the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in South Africa. In other words, this study generates new knowledge regarding the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in South Africa.

Secondly, the study contributes to the theoretical body of knowledge by introducing a new construct, namely teaching value, to replace the construct of price value in the UTAUT2. Most studies applying the UTAUT2 in educational settings excluded the construct of price value, justifying that it is irrelevant because teachers do not bear the costs associated with using the provided technology for teaching (Amadin et al., 2018; Mtebe et al., 2016). Consequently, the UTAUT2 becomes incapable of measuring the perceived value of using a certain type of technology for teaching. This creates a gap in the available UTAUT2 literature. Therefore, this study filled this literature gap by incorporating the construct of teaching value to measure the perceived value of using WhatsApp for ERT. Replacing price value with teaching value was critical to broadening the scope and generalisability of the UTAUT2 in the context of using WhatsApp for ERT. Furthermore, the findings of the hypothesised relationship

between teaching value and behavioural intention are considered novel and make a significant contribution to the UTAUT2 literature.

Thirdly, the present study contributes largely to the literature on technology acceptance by extending the UTAUT2 to the novel context of using WhatsApp for ERT. The study proposed an extension of the UTAUT2 to investigate the factors influencing secondary school teachers' behavioural intention to accept and use WhatsApp for ERT in the Namakgale Circuit. The extended UTAUT2 included 11 highly relevant constructs, namely performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit, attitude towards use, personal innovativeness, self-efficacy and behavioural intention. In addition, all 11 constructs of the extended UTAUT2 achieved validity and reliability. To the best of the researcher's knowledge, no previous studies have considered all 11 constructs in one technology acceptance theory or model for any study. Furthermore, the UTAUT2 was originally developed to study technology acceptance in a consumer context. Therefore, extending the UTAUT2 to the novel context of using WhatsApp for ERT was the greatest theoretical contribution of this study.

Fourthly, the study revealed that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy are significant factors that influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. Therefore, these findings validate the applicability of the UTAUT2 in the special context of using WhatsApp for ERT. In addition, these findings contribute to the understanding of the factors that influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT.

Fifthly, it was interesting to find that habit was the strongest predictor of behavioural intention. In the original UTAUT2, hedonic motivation was found to be the strongest predictor of behavioural intention. Therefore, this research adds to the UTAUT2 literature by establishing that habit is the best factor that predicts secondary school teachers' behavioural intention to accept and use WhatsApp for ERT.

Sixthly, the relationship between attitude towards use and behavioural intention has not been widely explored by studies employing the UTAUT2 as a theoretical framework (Nordhoff et al., 2020). Therefore, this research adds to the existing body of knowledge



by affirming that the relationship between attitude towards use and behavioural intention is spurious when performance expectancy and effort expectancy are included in the research model. Hence, this study found that attitude towards use had an insignificant influence on secondary school teachers' behavioural intention to accept and use WhatsApp for ERT.

Finally, the current study, after assessing the results of the hypotheses, modified the initial proposed extension of the UTAUT2, and the final proposed extension of the UTAUT2 was presented, which could be used to study the variables affecting teachers' behavioural intentions to accept and use WhatsApp for ERT in various cultural settings and countries. The final proposed extension of the UTAUT2 included only the significant predictors of behavioural intention to accept and use WhatsApp for ERT and could explain 50% of the variance in behavioural intention to accept and use WhatsApp for ERT. Therefore, the theoretical contribution of this study was to propose an extension of the UTAUT2 that may be employed to research the factors influencing teachers' behavioural intention to accept and use WhatsApp for ERT.

#### 6.4.2 Contributions to methodology

This study contributes to methodology by developing and validating the measurement items for the novel construct of teaching value. Although the construct has been adapted from the construct of learning value, the construct of teaching value is new in technology acceptance research. As such, it has never been validated before in any model or theory of technology acceptance. Therefore, this study is one of the first to develop and validate the items measuring the construct of teaching value in technology acceptance research. In this study, the construct of teaching value was examined for face validity, content validity, internal consistency reliability, convergent validity and discriminant validity. The results of these validity and reliability analyses demonstrated that the construct achieved validity and reliability. Therefore, the developed measurement items for the construct of teaching value may be replicated or adapted for future research using different technologies and in different cultures.

### **6.5 PRACTICAL IMPLICATIONS**

During the Covid-19 pandemic, the DBE in South Africa encouraged all teachers at primary and secondary school levels to use any digital platform that is accessible to them to implement ERT to ensure the continuity of education during the school

closures (Chirinda et al., 2021). Consequently, most teachers used WhatsApp to implement ERT due to its ease of use and accessibility (Vale & Graven, 2022). The current study investigated the factors influencing secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT in the Namakgale Circuit. The findings of this study provide several practical implications that are useful for schools and the DBE. The findings of the current research are noteworthy for schools and the DBE, as they will be aware of and understand the factors that influence teachers' behavioural intention to accept and use WhatsApp for ERT. By being aware of these factors, schools and the DBE can develop targeted professional development programs and provide the necessary resources and support to help teachers effectively use WhatsApp for ERT.

The findings of the present study are also crucial for any school in South Africa intending to implement ERT using WhatsApp. Knowing the factors influencing teachers' behavioural intention to accept and use WhatsApp for ERT will help the DBE and the schools to devise strategies for the successful implementation of ERT using WhatsApp. This will also enable schools and the DBE to be better prepared for future implementation of ERT using WhatsApp. In addition, the findings of this study will help schools and the DBE develop comprehensive emergency response plans and strategies for ensuring the continuity of education during crises. Furthermore, the findings of the present study will help schools and the DBE to make informed decisions regarding budget allocation for ERT activities and maximising the cost-effectiveness of ERT initiatives.

This study revealed that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy are the critical factors that influence secondary school teachers' behavioural intention to accept and use WhatsApp for ERT. The practical implications of these findings are that the schools and the DBE should pay close attention to these factors for the successful implementation of ERT using WhatsApp. This implies that schools and the DBE should strengthen these factors and ensure that they are met to enhance teachers' acceptance and use of WhatsApp for ERT. Furthermore, these factors need to be reinforced in case of future implementation of ERT using WhatsApp. Concerning the performance expectancy and effort expectancy factors, the main reason teachers accept and use WhatsApp for ERT is that using WhatsApp for ERT is easy, useful and

beneficial. Consequently, teachers who do not realise the ease of use, usefulness and benefits of using WhatsApp for ERT might not accept and use WhatsApp for ERT. Therefore, in order to increase the performance and effort expectancies of teachers, the DBE should outline and clearly communicate the usefulness and benefits of using WhatsApp for ERT to all the schools to distribute among the teachers. This can influence those teachers who may not know or understand the benefits or usefulness of using WhatsApp for ERT to accept and use WhatsApp for ERT.

In terms of the social influence factor, important others play a significant role in influencing teachers' behavioural intentions to accept and use WhatsApp for ERT. This study demonstrated that strengthening a collectivist culture among all the stakeholders of the school is crucial for enhancing teachers' behavioural intentions to accept and use WhatsApp for ERT. Therefore, schools should promote a collectivist culture among all the stakeholders of the school in order to improve teachers' behavioural intentions to accept and use WhatsApp for ERT. In addition, schools may strengthen teachers' social influence by encouraging all the stakeholders of the school to continue giving teachers their utmost support when they use WhatsApp for ERT. Schools may do this by sending e-mails or letters of gratitude to all the stakeholders of the school, thanking them for their continued support.

Regarding the facilitating conditions factor, the existence of resources and technical assistance plays an important role in influencing teachers' behavioural intentions to accept and use WhatsApp for ERT. Therefore, the DBE should supply schools with resources such as mobile devices with WhatsApp installed to use for ERT. In addition, the DBE should partner with the Department of Telecommunications and Postal Services and telecommunication companies to provide network boosters to enhance network connections in rural areas and also provide data-free access to WhatsApp. Furthermore, even though using WhatsApp for ERT requires little or no training, the DBE still needs to equip teachers with the knowledge pertaining to the use of WhatsApp for ERT. Therefore, the DBE needs to train teachers on the basics of using WhatsApp for ERT. This can also be done by sharing an instructional video or guide on how to use WhatsApp for ERT with the teachers. Moreover, facilitating conditions such as the availability of technical support cannot be ignored. Therefore, each school should have a community of practice WhatsApp groups where teachers assist one another in solving the technical challenges that they may encounter while using

WhatsApp for ERT. In addition, the schools may assign a group of teachers who have some knowledge of using WhatsApp for ERT to help solve the technical challenges that teachers may face while using WhatsApp for ERT.

With regard to the teaching value factor, it was found in this study that the time and effort that teachers put into teaching with WhatsApp are valuable to them and influence their behavioural intention to accept and use WhatsApp for ERT. This shows that teachers will devote their valuable time and effort to using WhatsApp for ERT if it helps them achieve their teaching objectives, control their teaching time and share educational content quickly and easily. Therefore, schools should constantly communicate and emphasise the benefits associated with the use of WhatsApp for ERT to teachers. Schools can also develop their list of the benefits of using WhatsApp for ERT by requesting teachers who use WhatsApp for ERT to enumerate the top five benefits of using WhatsApp for ERT that can persuade other teachers to accept and use WhatsApp for ERT.

Regarding the hedonic motivation, habit and self-efficacy factors, teachers intend to accept and use WhatsApp for ERT if using WhatsApp for ERT is enjoyable and habitual, and if they have confidence in their ability to use WhatsApp for ERT. Therefore, schools should improve these factors by organising workshops or seminars and inviting teachers who have experience using WhatsApp for ERT to share their experiences, best practices and strategies for deriving fun and enjoyment from using WhatsApp for ERT. Furthermore, schools should encourage teachers to use WhatsApp for ERT on a regular basis in order to build their confidence and habitual behaviours.

Overall, the main practical implications of the findings of this study are the need to provide teachers with the resources and regular training necessary to use WhatsApp for ERT. This could speed up the process of implementing ERT using WhatsApp at schools and eventually influence teachers' intentions to accept and use WhatsApp for ERT. Because teachers have different levels of knowledge, skill, confidence and experience with using WhatsApp for ERT, the DBE should design training sessions to meet the different needs of teachers. The training sessions can be categorised into two levels: entry and advanced. For example, teachers with no knowledge of or experience in using WhatsApp for ERT may prefer to first start with the entry level

training sessions and thereafter the advanced training sessions. On the other hand, teachers who already know how to use WhatsApp for ERT may only want to attend the advanced training sessions.

## **6.6 RECOMMENDATIONS**

This study, in addition to its practical implications, provides the following recommendations to the DBE and the schools.

### **6.6.1 Recommendations to the Department of Basic Education**

- Invest in providing schools with technological infrastructure such as mobile devices and internet connections.
- Provide professional development for teachers on how to use technology for learning and teaching.
- Develop an online learning platform for teachers to use for ERT.
- Establish clear guidelines to ensure a seamless transition to ERT.

### **6.6.2 Recommendations to the schools**

- Develop a school policy on the implementation of ERT using WhatsApp.
- Clearly communicate rules for engagement to learners on how to use WhatsApp for learning.
- Consider using WhatsApp with other free online learning platforms to provide learners with a more comprehensive emergency remote teaching experience.

## **6.7 LIMITATIONS OF THE STUDY**

Study limitations are flaws in a research design that might have an impact on the findings and conclusions of the study (Ross & Bibler Zaidi, 2019). Simon and Goes (2013) state that every research has limitations, regardless of how well it was designed and conducted. Therefore, this study, like other studies, has several limitations that should be mentioned. Firstly, this study only relied on the quantitative data collected using a close-ended questionnaire to address the research problem due to time restrictions. The study used a common way of collecting data for UTAUT2 studies (Tamilmani et al., 2019), but it was unable to obtain an in-depth comprehension of the factors that influence secondary school teachers' behavioural intentions to accept and

use WhatsApp for ERT. Nevertheless, the quantitative method successfully addressed the research questions and tested the stated hypotheses.

Secondly, the study relied on self-reported data, which may be affected by social desirability bias, where the respondents have the propensity to underreport socially unfavourable behaviours and overreport favourable behaviours. However, to mitigate this, the researcher assured the respondents that their participation in this study was completely anonymous. Thirdly, the findings of this study are based on the data collected at one point in time, regardless of the fact that the respondents' perceptions about using WhatsApp for ERT might change over time. However, a cross-sectional study was necessary for this study considering the budget and time allocated to conduct this study. Fourthly, a non-probability sampling procedure was used in this study. Although the convenience sampling procedure is common in UTAUT2 studies (Thaker et al., 2021), the sample could be subject to selection bias. However, this study was able to obtain a sample that is representative of the target population. Therefore, the results of this study should be generalised with caution.

Fifthly, the sample for this study was limited to teachers from public secondary schools in the Namakgale Circuit. Therefore, the results of this study should be generalised with caution. Fifthly, the extended UTAUT2 did not include the endogenous construct of use behaviour and the moderators of age, gender and experience as suggested in the original UTAUT2. Although the reasons to exclude them were explained in this study, including them in future research may offer interesting conclusions and contribute to the theoretical implications. Finally, in this study, the use of WhatsApp for ERT was discussed in a broad sense without focusing on a particular school subject. Therefore, it is possible that the factors influencing teachers' behavioural intentions to accept and use WhatsApp for ERT may differ across various school subjects.

## **6.8 SUGGESTIONS FOR FUTURE RESEARCH**

Given the limitations stated in the previous section and the results of the current research, the following suggestions for future research are made:

- Future research may consider employing a mixed-methods approach that comprises a quantitative questionnaire and a follow-up interview to gain in-

depth understanding of the factors influencing secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT.

- Future studies could consider conducting longitudinal research to provide a deeper understanding of the factors influencing teachers' behavioural intentions to accept and use WhatsApp ERT at different stages.
- Future research can consider using a probability sampling procedure to generalise the results to the population from which the sample was drawn.
- The extended UTAUT2 could be applied to both primary and secondary school teachers from different educational circuits to compare the findings.
- Future studies can include the endogenous construct of actual use and also test the influence of the moderators of age, gender and experience on behavioural intention to accept and use WhatsApp for ERT.
- Future studies can employ the extended UTAUT2 to investigate the factors influencing teachers' behavioural intentions to accept and use WhatsApp for teaching a particular school subject during ERT.

## **6.9 CONCLUSION**

The current research was conducted to investigate the factors that influence secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT in the Namakgale Circuit. This study effectively extended the UAUT2 as a theoretical framework to investigate the factors influencing secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT in the Namakgale Circuit. The UTAUT2 was extended by replacing the price value construct of the original UTAUT2 with the teaching value construct and incorporating three additional constructs, namely attitude towards use, personal innovativeness and self-efficacy. These additional constructs were identified through an intensive review of the literature. The present research, despite its limitations, offers valuable insight into the factors influencing secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT. The current research has successfully and effectively addressed the problem under investigation, answered the research questions and confirmed the stated hypotheses. In addition, this study successfully achieved the research aim and objectives.

This study revealed that the level of acceptance and use of WhatsApp for ERT by secondary school teachers in the Namakgale Circuit was high. The greatest strength of this study was the use of the CB-SEM method to test the hypothesised relationships. The results of hypotheses testing demonstrated that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, teaching value, habit and self-efficacy were the critical factors that significantly influenced secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT in the Namakgale Circuit. Among these factors, habit was the best factor predicting secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT in the Namakgale Circuit. In addition, the results of hypotheses testing revealed that attitude towards use and personal innovativeness factors were insignificant in influencing secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT in the Namakgale Circuit. Moreover, this study proposed an extension of the UTAUT2 that could be employed by studies investigating the elements affecting teachers' behavioural intention to accept and use WhatsApp for ERT. The proposed extension of the UTAUT2 explained 50% of the variance in behavioural intention to accept and use WhatsApp for ERT.

Although the present study only used the UTAUT2 as a theoretical framework with additional constructs to investigate the factors influencing secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT, the extended UTAUT2 provided greater insight into the factors that influence secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT. The findings of this study, despite the research limitations, demonstrated that the extended UTAUT2 was robust in establishing the factors influencing secondary school teachers' behavioural intentions to accept and use WhatsApp for ERT. Furthermore, the findings of this study filled the literature gaps outlined in Chapter 1 and provide valuable contributions to theory and methodology. The findings of this study provide useful practical implications and suggestions for future research.



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## **APPENDICES**

### **Appendix A: Questionnaire**

Dear prospective participant

You are invited to participate in a survey conducted by Thersy Mangena under the supervision of Dr AR Molotsi, a senior lecturer in the Department of Science and Technology Education towards a PhD in Information and Communication Technology in Education at the University of South Africa.

The survey you have received has been designed to study the factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching. You were selected to participate in this survey because you use WhatsApp for emergency remote teaching. By completing this survey, you agree that the information you provide may be used for research purposes, including dissemination through peer-reviewed publications and conference proceedings.

It is anticipated that the information I gain from this survey will help me to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching. You are, however, under no obligation to complete the survey and you can withdraw from the study prior to submitting the survey. The survey is developed to be anonymous, meaning that I will have no way of connecting the information you provide to you personally. Consequently, you will not be able to withdraw from the study once you have clicked the send button based on the anonymous nature of the survey. If you choose to participate in this survey, it will take up no more than 20 minutes of your time. You will not benefit from your participation as an individual; however, it is envisioned that the findings of this study may help teachers to become aware of the factors influencing their acceptance and use of WhatsApp for emergency remote teaching. I do not foresee that you will experience any negative consequences by completing the survey. I undertake to keep any information provided herein confidential, not to let it out of my possession and to report on the findings from the perspective of the participating group and not from the perspective of an individual.

The records will be kept for five years for audit purposes, whereafter they will be permanently destroyed. Data will be permanently deleted from the hard drive of the computer. You will not be reimbursed or receive any incentives for your participation in the survey.

The research was reviewed and approved by the College of Education Research Ethics Committee. The primary researcher, Thersy Mangena, can be contacted during office hours at 073 461 2179. The study supervisor, Dr AR Molotsi, can be contacted during office hours

at 012 429 3265. Should you have any questions regarding the ethical aspects of the study, you can contact the chairperson of the College of Education Research Ethics Committee at 012 429 2840. Alternatively, you can report any serious unethical behaviour via the University’s toll-free hotline at 0800 86 96 93.

By selecting “I agree to participate” below, you agree to participate voluntarily. You are free to withdraw from the study at any time prior to clicking the send button.

I agree to participate.

I do not want to participate.

**Section A: Biographical Information**

Select only one answer for each question by making an X in the appropriate box.

**1. What is your gender?**

Male		Female		Other	
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**2. What is your age group?**

20–29		30–39		40–49		50–59		60 and above	
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**3. How long have you been using WhatsApp for emergency remote teaching?**

Less than 1 year		1–2 years		More than 2 years	
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**4. What is your highest educational qualification?**

Diploma		Bachelor’s degree		Honours degree		Master’s degree		PhD	
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**Section B: Factors influencing the acceptance and use of WhatsApp for emergency remote teaching**

\*Note: ‘Emergency remote teaching’ refers to a temporary transition from traditional classroom instruction to remote teaching due to the Covid-19 pandemic crisis.

Please respond to each of the statements below by selecting either Strongly disagree (SD), Disagree (D), Neither agree nor disagree (NA/D), Agree (A) or Strongly agree (SA).	SD	D	NA/ D	A	SA
<b>5. Performance expectancy</b>					
PE1: I find WhatsApp useful for emergency remote teaching.					
PE2: Using WhatsApp for emergency remote teaching enables me to accomplish teaching tasks more quickly.					
PE3: Using WhatsApp for emergency remote teaching promotes my teaching goals.					
PE4: Using WhatsApp for emergency remote teaching increases my teaching productivity.					
<b>6. Effort expectancy</b>					
EE1: Learning how to use WhatsApp for emergency remote teaching is easy for me.					
EE2: I find WhatsApp easy to use for emergency remote teaching.					
EE3: It is easy for me to become proficient in using WhatsApp for emergency remote teaching.					
EE4: Using WhatsApp for emergency remote teaching is clear and understandable.					
<b>7. Social influence</b>					

SI1: Parents of the learners think that I should use WhatsApp for emergency remote teaching.					
SI2: My learners think that I should use WhatsApp for emergency remote teaching.					
SI3: My colleagues think that I should use WhatsApp for emergency remote teaching.					
SI4: The school management team is supportive of using WhatsApp for emergency remote teaching.					
<b>8. Facilitating conditions</b>					
FC1: I have the resources (e.g. mobile device and internet connection) necessary to use WhatsApp for emergency remote teaching.					
FC2: I am knowledgeable about using WhatsApp for emergency remote teaching.					
FC3: I can get help from other colleagues if I have difficulties navigating through WhatsApp functions and using WhatsApp for emergency remote teaching.					
FC4: WhatsApp is similar to other digital tools (e.g. Zoom, Telegram) I use for emergency remote teaching.					
<b>9. Hedonic motivation</b>					
HM1: Using WhatsApp for emergency remote teaching is fun.					
HM2: Using WhatsApp for emergency remote teaching is meaningful.					
HM3: Using WhatsApp for emergency remote teaching is exciting.					
HM4: Using WhatsApp for emergency remote teaching is interesting.					
<b>10. Teaching value</b>					

TV1: Teaching through WhatsApp is worth more than the time and effort given to it.					
TV2: WhatsApp gives me the opportunity to control my own teaching time.					
TV3: WhatsApp allows me to share educational content quickly and easily.					
TV4: WhatsApp provides me with the opportunity to achieve my teaching objectives.					
<b>11. Habit</b>					
HT1: The use of WhatsApp for emergency remote teaching has become a habit for me.					
HT2: I am addicted to using WhatsApp for emergency remote teaching.					
HT3: I must use WhatsApp for emergency remote teaching.					
HT4: Using WhatsApp for emergency remote teaching motivates me to learn more about the use of WhatsApp for emergency remote teaching.					
<b>12. Attitude towards use</b>					
ATU1: Using WhatsApp for emergency remote teaching is a good idea.					
ATU2: I like using WhatsApp for emergency remote teaching.					
ATU3: Using WhatsApp for emergency remote teaching makes my work interesting.					
ATU4: I think it is valuable to use WhatsApp for emergency remote teaching.					
<b>13. Personal innovativeness</b>					
PI1: I like to try new WhatsApp features for emergency remote teaching.					

PI2: When I hear about new WhatsApp features, I would look for ways to experiment with them in emergency remote teaching.					
PI3: Among my colleagues, I'm usually one of the first to try out new WhatsApp features for emergency remote teaching.					
PI4: In general, I am reluctant to try new WhatsApp features for emergency remote teaching.					
<b>14. Self-efficacy</b>					
SE1: I know how to use WhatsApp for emergency remote teaching.					
SE2: I am confident in using WhatsApp for emergency remote teaching even if there is no one around to show me how to do it.					
SE3: I am confident in using WhatsApp for emergency remote teaching even if I have never used WhatsApp for teaching before.					
SE4: I feel I am in control when I use WhatsApp for emergency remote teaching.					
<b>15. Behavioural intention</b>					
BI1: I intend to continue using WhatsApp for emergency remote teaching in the future.					
BI2: I always consider using WhatsApp for emergency remote teaching.					
BI3: I will continue using WhatsApp for emergency remote teaching regularly.					
BI4: I will recommend to other teachers to use WhatsApp for emergency remote teaching.					

## Appendix B: Section B measurement items

Construct	Description of Item	Source
Performance expectancy	PE1: I find WhatsApp useful for emergency remote teaching.	(Azizi et al., 2020; Skoumpopoulou et al., 2018; Venkatesh et al., 2012)
	PE2: Using WhatsApp for emergency remote teaching enables me to accomplish teaching tasks more quickly.	
	PE3: Using WhatsApp for emergency remote teaching promotes my teaching goals.	
	PE4: Using WhatsApp for emergency remote teaching increases my teaching productivity.	
Effort expectancy	EE1: Learning how to use WhatsApp for emergency remote teaching is easy for me.	(Abbad, 2021; Azizi et al., 2020; Venkatesh et al., 2012)
	EE2: I find WhatsApp easy to use for emergency remote teaching.	
	EE3: It is easy for me to become proficient in using WhatsApp for emergency remote teaching.	
	EE4: Using WhatsApp for emergency remote teaching is clear and understandable.	
Social influence	SI1: Parents of the learners think that I should use WhatsApp for emergency remote teaching.	(Azizi et al., 2020; Skoumpopoulou et al., 2018; Venkatesh et al., 2012)
	SI2: My learners think that I should use WhatsApp for emergency remote teaching.	
	SI3: My colleagues think that I should use WhatsApp for emergency remote teaching.	
	SI4: The school management team is supportive of using WhatsApp for emergency remote teaching.	
Facilitating conditions	FC1: I have the resources (e.g. mobile device and internet connection) necessary to use WhatsApp for emergency remote teaching.	(Chao, 2019; Skoumpopoulou et al., 2012)

	FC2: I am knowledgeable about using WhatsApp for emergency remote teaching.	2018; Venkatesh et al., 2012)
	FC3: I can get help from other colleagues if I have difficulties navigating through WhatsApp functions and using WhatsApp for emergency remote teaching.	
	FC4: WhatsApp is similar to other digital tools (e.g. Zoom, Telegram) I use for emergency remote teaching.	
Hedonic motivation	HM1: Using WhatsApp for emergency remote teaching is fun.	Azizi et al., 2020; Venkatesh et al., 2012)
	HM2: Using WhatsApp for emergency remote teaching is meaningful.	
	HM3: Using WhatsApp for emergency remote teaching is exciting.	
	HM4: Using WhatsApp for emergency remote teaching is interesting.	
Teaching value	TV1: Teaching through WhatsApp is worth more than the time and effort given to it.	(Ain et al., 2015; Dajani & Hegleh, 2019; Prasetyo et al., 2021)
	TV2: WhatsApp gives me the opportunity to control my own teaching time.	
	TV3: WhatsApp allows me to share educational content quickly and easily.	
	TV4: WhatsApp provides me with the opportunity to achieve my teaching objectives.	
Habit	HT1: The use of WhatsApp for emergency remote teaching has become a habit for me.	(Azizi et al., 2020; Skoumpopoulou et al., 2018; Venkatesh et al., 2012)
	HT2: I am addicted to using WhatsApp for emergency remote teaching.	
	HT3: I must use WhatsApp for emergency remote teaching.	

	HT4: Using WhatsApp for emergency remote teaching motivates me to learn more about the use of WhatsApp for emergency remote teaching.	
Attitude towards use	ATU1: Using WhatsApp for emergency remote teaching is a good idea.	(Camilleri & Camilleri, 2019; Davis et al., 1989)
	ATU2: I like using WhatsApp for emergency remote teaching.	
	ATU3: Using WhatsApp for emergency remote teaching makes my work interesting.	
	ATU4: I think it is valuable to use WhatsApp for emergency remote teaching.	
Personal Innovativeness	PI1: I like to try new WhatsApp features for emergency remote teaching.	(Agarwal & Prasad, 1998; Dajani & Hegleh, 2019; Mokhtar et al., 2018)
	PI2: When I hear about new WhatsApp features, I would look for ways to experiment with them in emergency remote teaching.	
	PI3: Among my colleagues, I'm usually one of the first to try out new WhatsApp features for emergency remote teaching.	
	PI4: In general, I am reluctant to try new WhatsApp features for emergency remote teaching.	
Self-efficacy	SE1: I know how to use WhatsApp for emergency remote teaching.	(Compeau & Higgins, 1995; Mokhtar et al., 2018; Zhao et al., 2020)
	SE2: I am confident in using WhatsApp for emergency remote teaching even if there is no one around to show me how to do it.	
	SE3: I am confident in using WhatsApp for emergency remote teaching even if I have never used WhatsApp for teaching before.	
	SE4: I feel I am in control when I use WhatsApp for emergency remote teaching.	
Behavioural intention	BI1: I intend to continue using WhatsApp for emergency remote teaching in the future.	(Azizi et al., 2020; Nguyen & Nguyen, 2021;

	BI2: I always consider using WhatsApp for emergency remote teaching.	Skoumpopoulou et al., 2018; Venkatesh et al., 2012)
	BI3: I will continue using WhatsApp for emergency remote teaching regularly.	
	BI4: I will recommend to other teachers to use WhatsApp for emergency remote teaching.	



## Appendix C: Ethical clearance certificate



### UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2022/04/13

Ref: **2022/04/13/59447990/14/AM**

Name: Mr T Mangena

Student No.: 59447990

Dear Mr T Mangena

**Decision:** Ethics Approval from  
2022/04/13 to 2027/04/13

**Researcher(s):** Name: Mr T Mangena  
E-mail address: 59447990@mylife.unisa.ac.za  
Telephone: 073 4612 179

**Supervisor(s):** Name: Dr AR Molotsi  
E-mail address: Molotar@unisa.ac.za  
Telephone: 012 429 3265

**Title of research:**

**Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching**

**Qualification:** PhD ICT in Education

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2022/04/13 to 2027/04/13.

*The **low risk** application was reviewed by the Ethics Review Committee on 2022/04/13 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.
2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.



University of South Africa  
Pretor Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4130  
www.unisa.ac.za

3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date **2027/04/13**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

*Note:*

The reference number **2022/04/13/59447990/14/AM** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Kind regards,



**Prof AT Motihabane**  
**CHAIRPERSON: CEDU RERC**  
 motihat@unisa.ac.za



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



University of South Africa  
 Pretter Street, Muckleneuk Ridge, City of Tshwane  
 PO Box 383 UNISA 0003 South Africa  
 Telephone: +27 12 429 3111 Facsimile: +27 12 429 4130

## Appendix D: Permission granted by the Limpopo Research Committee

CONFIDENTIAL



OFFICE OF THE PREMIER

**TO: DR MC MAKOLA**

**FROM: DR T MABILA**

**CHAIRPERSON: LIMPOPO PROVINCIAL RESEARCH COMMITTEE (LPRC)**

**ONLINE REVIEW DATE: 19<sup>th</sup> – 30<sup>th</sup> MAY 2022**

**SUBJECT: FACTORS INFLUENCING SECONDARY SCHOOL TEACHERS' ACCEPTANCE  
AND USE OF WHATSAPP FOR EMERGENCY REMOTE TEACHING**

**RESEARCHER: MANGENA T**

Dear Colleague

The above researcher's research proposal served at the Limpopo Provincial Research Committee (LPRC). The committee is satisfied with methodological soundness of the proposal.

**Decision: The research proposal is granted approval**

Regards

Acting Chairperson: Dr T Mabila

Secretariat: Ms J Mokobi

Date: 03/06/2022

## **Appendix E: Letter to Mopani District Director requesting for permission**

### **Request for permission to conduct research at secondary schools under Lulekani and Namakgale Circuits**

Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching

10 June 2022

The District Director

Mopani District

Tel: 015 811 7803

Dear sir/madam

I, Thersy Mangena, am doing research under the supervision of Dr AR Molotsi, a senior lecturer in the Department of Science and Technology Education towards a PhD in Information and Communication Technology in Education at the University of South Africa. I am requesting your permission to conduct research at secondary schools in the Lulekani and Namakgale circuits. The study is titled "Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching".

The aim of the study is to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching. The schools have been selected because their teachers use WhatsApp for emergency remote teaching. The study will entail requesting teachers to complete an anonymous online questionnaire administered using Google Forms.

The research results may help schools to become aware of the factors that influence teachers to accept and use WhatsApp for emergency remote teaching. There are no risks involved in participating in this research. There will be no reimbursement or any incentives for participation in the research.

The feedback procedure will entail the submission of the research report to the district office.

Yours sincerely



---

Thersy Mangena

Cell phone number: 073 4612 179

## Appendix F: Permission granted by Mopani District Director



LIMPOPO  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
EDUCATION

MOPANI EAST DISTRICT

**CONFIDENTIAL**

Ref : 2/2/2      ENQ: Ngobeni D      Email: [davidngobeni9@gmail.com](mailto:davidngobeni9@gmail.com)      Date: 20.07.2022

TO : MANGENA T

### PERMISSION TO CONDUCT RESEARCH: FACTORS INFLUENCING SECONDARY SCHOOL TEACHERS' ACCEPTANCE AND USE OF WHATSAPP FOR EMERGENCY REMOTE TEACHING

1. The above matter refers.
2. The Department wishes to inform you that your request to conduct research on the above mentioned Topic has been approved.
3. Your focus should only be limited to selected schools at Lulekani and Namakgale Circuits as per the list of the Schools listed below:

Name of circuit	Lulekani	Namakgale
<b>Schools</b>	Baranuka	Lebeko
	Majeje	Lepato
	Masaswivona	Maphokwane
	Nkateko	Matome Malatji
	Ntshuxeko	Relebogile
		Sebalamakgolo
		Vuxeni

4. The following conditions should be considered:
  - 4.1. Arrangement should be made with selected schools.
  - 4.2. The research should not be conducted during Examinations especially the 4<sup>th</sup> term.
  - 4.3. During research, applicable research ethics should be adhered to, in particular the principle of voluntary participation (the people involved should be respected).
  - 4.4. Upon completion of the research study, the researcher shall share the final product of the research with the Department.
  - 4.5. The research should not have any financial implications to the Department of Education Limpopo Province.

### PERMISSION TO CONDUCT RESEARCH: MANGENA T

DEPARTMENT OF EDUCATION  
MOPANI EAST DISTRICT, Private Bag X 578 GIYANI, 0825  
Tel 015 811 7803

*The heartland of Southern Africa – development is about people*

5. Furthermore, you are expected to produce this letter to schools and offices where you intend to conduct your research since it will serve as proof that you have been granted permission to conduct the research.
6. The Department appreciates the contribution that you wish to make and wishes you success in your research.



*pp* DISTRICT DIRECTOR

20.07.2022

.....  
DATE

---

**PERMISSION TO CONDUCT RESEARCH: MANGENA T**

**DEPARTMENT OF EDUCATION**  
MOPANI EAST DISTRICT, Private Bag X 578 GIYANI, 0826  
Tel 015 811 7803

*The heartland of Southern Africa – development is about people*

## **Appendix G: Letter to Lulekani Circuit Manager requesting for permission**

### **Request for permission to conduct research at secondary schools under Lulekani Circuit**

Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching

25 July 2022

The Circuit Manager

Lulekani Circuit

Tel: 015 781 0071

Dear Sir/Madam

I, Thersy Mangena, am doing research under the supervision of Dr AR Molotsi, a senior lecturer in the Department of Science and Technology Education towards a PhD in Information and Communication Technology in Education at the University of South Africa. I am requesting your permission to conduct research at the secondary schools in the Lulekani Circuit. The study is titled "Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching".

The aim of the study is to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching. The schools have been selected because their teachers use WhatsApp for emergency remote teaching. The study will entail requesting teachers to complete an anonymous online questionnaire administered using Google Forms.

The research results may help schools to become aware of the factors that influence teachers to accept and use WhatsApp for emergency remote teaching. There are no risks involved in participating in this research. There will be no reimbursement or any incentives for participation in the research.

The feedback procedure will entail the submission of the research report to the principals of the participating schools.

Yours sincerely



---

Thersy Mangena

Researcher

Cell phone number: 073 4612 179

## **Appendix H: Letter to Namakgale Circuit Manager requesting for permission**

### **Request for permission to conduct research at secondary schools under Namakgale Circuit**

Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching

25 July 2022

The Circuit Manager

Namakgale Circuit

Tel: 015 7692 623

Dear Sir/Madam

I, Thersy Mangena, am doing research under the supervision of Dr AR Molotsi, a senior lecturer in the Department of Science and Technology Education towards a PhD in Information and Communication Technology in Education at the University of South Africa. I am requesting your permission to conduct research at all the seven secondary schools in the Namakgale Circuit. The study is titled "Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching".

The aim of the study is to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching. The schools have been selected because their teachers use WhatsApp for emergency remote teaching. The study will entail requesting teachers to complete an anonymous online questionnaire administered using Google Forms.

The research results may help schools to become aware of the factors that influence teachers to accept and use WhatsApp for emergency remote teaching. There are no risks involved in participating in this research. There will be no reimbursement or any incentives for participation in the research.

The feedback procedure will entail the submission of the research report to the principals of the participating schools.

Yours sincerely



---

Thersy Mangena

Researcher

Cell phone number: 073 4612 179



## Appendix I: Permission granted by Lulekani Circuit Manager



**LIMPOPO**  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

### DEPARTMENT OF EDUCATION

**MOPANI EAST DISTRICT  
LULEKANI CIRCUIT**

28.08.2022

To : MANGENA T

RE : **PERMISSION TO CONDUCT RESEARCH: FACTORS INFLUENCING  
SECONDARY SCHOOLTEACHERS' ACCEPTANCE AND USE OF WHATSAPP  
FOR EMERGENCY REMOTE TEACHING**

1. The matter above refers.
2. Your application to conduct research on factors influencing secondary schools teachers acceptance and use of whatsapp for emergency remote teaching has been received
3. Permission is hereby granted with immediate effect.
4. Your co – operation is highly appreciated

Signed:   
NTSANWISI M.E. Ms  
Circuit Manager  
082 386 9214  
[ntsanwisime@gmail.com](mailto:ntsanwisime@gmail.com)



**45 Tambotie Street, Phalaborwa Private Bag X12012, Lulekani 1392, Telephone 015 781 0071/2, Fax 015 1265**

**EDUCATION – A PRE-CONDITION FOR DEVELOPMENT**

## Appendix J: Permission granted by Namakgale Circuit Manager



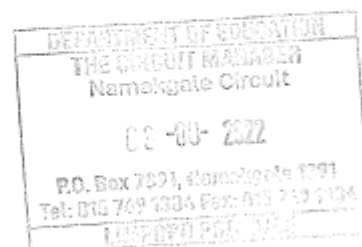
### PERMISSION TO CONDUCT RESEARCH: FACTORS INFLUENCING SECONDARY SCHOOL TEACHERS' ACCEPTANCE AND USE OF WHATSAPP FOR EMERGENCY REMOTE TEACHING.

1. The above matter bears reference
2. The letter seeks to inform all the schools identified by the MANGENA T (researcher) to allow him to conduct the research and the affected schools are as listed below:
  - (i) Lebeko
  - (ii) Lepato
  - (iii) Maphokwane
  - (iv) Matome Malatji
  - (v) Relebogile
  - (vi) Sebalamakgolo
  - (vii) Vuxeni
3. The conditions as stated in the letter from the District granting him a permission to conduct the research should be adhered to at all times.
4. I the undersigned would like to wish him fruitful engagement with the schools as his findings will be of utmost importance in relation to infusing and embracing IT in our education system.



CIRCUIT MANAGER

03/08/2022  
DATE



DEPARTMENT OF EDUCATION  
MOPANI DISTRICT, Private Bag X 578 GIYANI, 0826  
Tel 015 811 7700 Fax No. 015 812 3412 or 015 812 1689

*The heartland of Southern Africa – development is about people*

## Appendix K: Letter to the school principals requesting for permission

Request for permission to conduct research at \_\_\_\_\_secondary school

Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching

1 August 2022

The Principal

\_\_\_\_\_secondary school

1391

Dear sir/madam

I, Thersy Mangena, am doing research under the supervision of Dr AR Molotsi, a senior lecturer in the Department of Science and Technology Education towards a PhD in Information and Communication Technology in Education at the University of South Africa. We are inviting you to participate in a study titled "Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching".

The aim of the study is to investigate the factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching. Your school has been selected because the teachers use WhatsApp for emergency remote teaching. The study will entail requesting teachers to complete an anonymous online questionnaire administered using Google Forms.

The research results may help your school to become aware of the factors that influence teachers to accept and use WhatsApp for emergency remote teaching. There are no risks involved in participating in this research. There will be no reimbursement or any incentives for participation in the research.

The feedback procedure will entail the submission of the research report to the school.

Yours sincerely



Thersy Mangena

Researcher

Cell: 073 4612 179

## Appendix L: Permission granted by the school principals



**LEBOKO HIGH SCHOOL**  
Emis No. 913420192  
Private Bag X11033, Namakgale 1391  
Tel: 081 487 2810 / 082 465 3053



04 August 2022

Mr. Mangena Thersy  
PO Box 1510  
Tzaneen  
1850

Dear Sir



### **PERMISSION FOR REASEARCH STUDY GRANTED**

1. Your letter dated 04 August 2022 refers.
2. We hereby grant you permission to conduct a research in the school as stipulated in your application. Your research is focusing on Factors influencing secondar school teachers's acceptance and use of WhatsApp for emergency remote teaching.
3. We wish you a successful undertaking in your research.

Yours Faithfully

A handwritten signature in black ink, appearing to be 'SG Mokoele', written over a horizontal line.

SG Mokoele (Principal)



# Baramuka Secondary School

P. O. Box 1436

Department of Education

Enquiries: Mahlaule NR

Email address:

baranukasec@gmail.com

Contact no. 083 486 3191

EMIS NO: 917421101

Lulekani  
1392

Limpopo Province

PO BOX 1436

Lulekani

1392

15 AUGUST 2022

BARANUKA

SECONDARY

SCHOOL

Mr Mangena Thersy  
House no 2420  
Namakgale  
1391

Dear Sir

Re-permission to conduct research in our school: August 2022

1. The matter above bears reference
2. We as the school management, considering your research will also benefit us as a school hereby grant you the permission to conduct your research.
3. We hope the outcomes will help us understand the factors that influence teachers to accept and use WhatsApp for emergency remote teaching.
4. We also believe there are no risks involved in participating in this research.
5. We wish you well in your endeavours

Principal

READING

BRIGHTENS

INSIGHT

DEPARTMENT OF EDUCATION  
BARANUKA SECONDARY SCHOOL

15 AUG 2022

P.O. Box 1436 Lulekani 1392

LIMPOPO PROVINCE 15

*"Reading brightens insight"*

Enq : The Principal

Lepato M. High School

P O Box 787

Contact No : 0610600614

Phalaborwa

EMIS : 913420208

1390



P.O BOX 1510

Tzaneen

0850

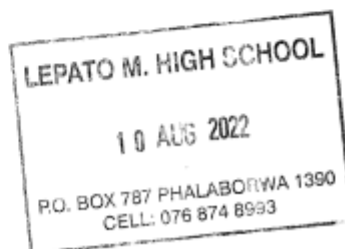
To: Mangena T

**RE:** Request for permission to conduct Research: Secondary School teachers' acceptance and use of WhatsApp for emergency remote teaching.

1. The above matter refers
2. We hereby grant you permission to conduct research in our school.
3. We wish you success in your studies.

Yours Faithfully

Principal Nare M.D



Date: 10-08-2022

Maphokwane High School  
P. O. Box 7224  
NAMAKGALE  
1391  
EMIS NO. 913420307



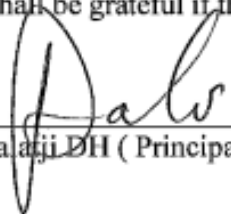
Enq: Malatji D.H.  
Cell: 083 961 1987  
Cell: 073 117 6203

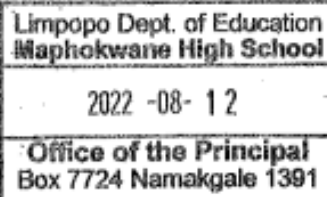
12 AUGUST 2022

**TO WHOM IT MAY CONCERN**

This serves to confirm that **Mangena Thersy** has been granted permission to do research with educators of the above mentioned school about the factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching.

I shall be grateful if the above can be accepted.

  
Malatji DH (Principal) 083 961 1987



**MATOME MALATJI  
HIGH SCHOOL**



Maseke Village  
Phalaborwa  
1390

Box 877  
Phalaborwa  
1390  
Tel: 073 331 2212

Enq: Maseleme EP  
Email: [shuwim@gmail.com](mailto:shuwim@gmail.com)

**TO: Thersy Mangena (Researcher)**

Sir

**PERMISSION TO CONDUCT RESEARCH: FACTORS INFLUENCING SECONDARY SCHOOL  
TEACHER' ACCEPTANCE AND USE OF WATSAPP FOR EMERGENCY REMOTE TEACHING.**

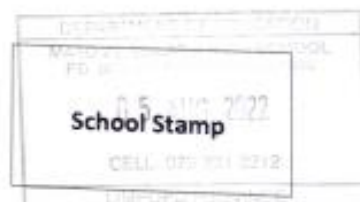
1. The above matter bear's reference.
2. The letter serves to give you approval to conduct your research at our school.
3. We hope to give you maximum cooperation and team working.
4. We hope the results of your research will improve the usage of **WHATSAPP** and **ICT** in our school.

Thanking you in advance

Yours Truly

**Maseleme E.P (Principal)**

  
Signature





# RELEBOGILE HIGH SCHOOL



## PHYSICAL ADDRESS

Stand No. 3467 Zone B  
Namakgale  
1391

ENC: Mathe Z.V (Principal)

Cell: 073 - 368 4916

Email: relebogilehs@gmail.com

Emis No: 913420611

Circuit: Namakgale

## POSTAL ADDRESS

Private Bag X 11014  
Namakgale  
1391



District: Mopani East

**MOTTO: "PERSEVERANCE IS THE MOTHER OF SUCCESS"**

Reference: RESEARCH

19/08/2022

Enquiries: Lebetha M. B

Cell No: 073 315 5685

RE: ACKNOWLEDGEMENT OF THE RESEARCH UNDERTAKEN

1. This letter has reference;
2. It serves to acknowledge that **Mr Mangena Thersy** has been granted the permission to carry out the research titled: **FACTORS INFLUENCING SECONDARY SCHOOL TEACHERS' ACCEPTANCE AND USE OF WHATSAPP FOR EMERGENCY REMOTE TEACHING.**
3. We hope that he will receive all the necessary cooperation he deserves.
4. Hoping for your cooperation.
5. Thank you so much.

YOURS FAITHFULLY

Lebetha M. B - DH (Humanities) -

Mathe Z. V - Principal -





TO: MANGENA T  
HOUSE 2420  
NAMA KGALE  
1391

Dear Sir

**RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

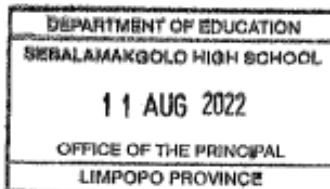
1. The office of the principal hereby grants you permission to conduct research on the topic:  
**FACTORS INFLUENCING SECONDARY SCHOOL TEACHERS' ACCEPTANCE AND USE OF  
WHATSAPP FOR EMERGENCY REMOTE TEACHING.**
2. Effective from 12 August 2022
3. The school wishes you well in your research project.

Regards

Yours faithfully

Malebana N.F

Acting Principal



Enquiries: Ndlozi N.D.  
Email: vuxenihighschool@gmail.com  
Contact: 0656721567 / 0656554246



Vuxeni High School  
1813 Zone A  
NAMAAGALE  
1391  
P.O BOX 836  
PHALABORWA  
1390

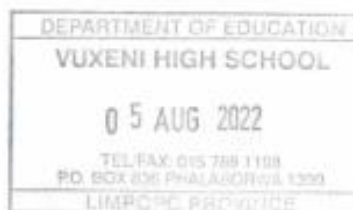
**05 AUGUST 2022**

MANGENA T  
HOUSE NO. 2420  
Namakgale  
1391

**RE: APPROVAL TO CONDUCT RESEARCH TITLED: "FACTORS INFLUENCING SECONDARY SCHOOL TEACHERS ACCEPTANCE AND USE OF WHATSAPP FOR EMERGENCY REMOTE TEACHING".**

1. The above mentioned school is granting you a permission to conduct research on the above mentioned topic.
  2. The school is going to support and give you information as required.
- Hope you will find the above in order.

  
.....  
Ndlozi ND (School Principal)



NKATEKO HIGH SCHOOL

P.O. BOX 1312

LULEKANI 1392

☎015-78301118



Enquiries : Shiseve NW (079 855 1418/ 073 097 3902)

15 August 2022

Mangena T  
NAMAAGALE  
1391

Dear Madam

ACCEPTANCE LETTER TO CONDUCT RESEARCH

1. The above matter bears reference.
2. In response to your letter dated 15 August 2022, I hereby accept your request to do research at our school.

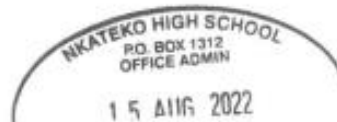
---

I hope you will enjoy working with us.

Yours sincerely

Shiseve NW

(Principal)



## Appendix M: Language editor's letter

**LaetitiaBEDEKER**

1 Semillon Close  
Stonehaven Estate  
Fish Hoek  
Cell: 082 707 8428  
E-mail: laetitiam@webmail.co.za

### **Proof of editing**

6 March 2023

This letter serves as proof that the PhD thesis titled "Factors influencing secondary school teachers' acceptance and use of WhatsApp for emergency remote teaching" by Thersy Mangena was professionally copy (language) edited. The finalisation of tracked changes and comments inserted remains the responsibility of the student.

Kind regards



**LM Bedeker**

BA, Postgraduate Diploma (Translation) *cum laude*, MPhil (Translation) *cum laude*  
Accredited member of the South African Translators' Institute (accreditation number 1001437)  
Member of the Professional Editors' Group

## Appendix N: Turnitin report

Factors influencing secondary school teachers' behavioural intentions to accept the use of WhatsApp for emergency remote teaching in Mopani District Limpopo Province

### ORIGINALITY REPORT

<b>28%</b> SIMILARITY INDEX	<b>17%</b> INTERNET SOURCES	<b>26%</b> PUBLICATIONS	<b>6%</b> STUDENT PAPERS
--------------------------------	--------------------------------	----------------------------	-----------------------------

### PRIMARY SOURCES

<b>1</b>	<b>Mangena, Thersy. "Grade 10 Learners' Experiences of Learning English Vocabulary with Mobile Devices", University of Johannesburg (South Africa), 2022</b> Publication	<b>2%</b>
<b>2</b>	<b>hdl.handle.net</b> Internet Source	<b>2%</b>
<b>3</b>	<b>napier-repository.worktribe.com</b> Internet Source	<b>2%</b>
<b>4</b>	<b>etd.uum.edu.my</b> Internet Source	<b>1%</b>
<b>5</b>	<b>journals.sfu.ca</b> Internet Source	<b>1%</b>
<b>6</b>	<b>nrl.northumbria.ac.uk</b> Internet Source	<b>1%</b>
<b>7</b>	<b>eprints.rclis.org</b> Internet Source	<b>1%</b>