

**EXPLORING TEACHER KNOWLEDGE OF INFORMATION AND  
COMMUNICATION TECHNOLOGIES IN CURRICULUM PRACTICE**

**By**

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## DECLARATION

I, Nomawabo Jessica Lobete Tabata declare that this dissertation, **EXPLORING TEACHERS' KNOWLEDGE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN CURRICULUM PRACTICE** is my inventive work and that all sources that I have used or cited have been indicated and acknowledged by means of comprehensive referencing. This research is not a replication of any published qualification.

.....

**SIGNATURE**

(Mrs N.J. Lobete Tabata)

.....

**DATE**

## **DEDICATION**

This study is dedicated to my late mother who have discerned that I have potential in education whilst I was still very young and to my husband who believes in education.

May my mother's dear soul rest in peace.

## ACKNOWLEDGEMENTS

- ✚ To my Great and Almighty God, Who gave me strength even though sometimes I was weak and sick physically and emotionally, but my God endured to give me the acumen and audacity to complete this dissertation.
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## **ABSTRACT**

Vandeyar (2020:1) argues that currently, some teachers have less knowledge or no knowledge in ICTs, particularly in curriculum practice, which affects the enhancement of teaching and learning, particularly in rural schools. The South African Government, predominantly in the Eastern Cape Province, have taken the high inventiveness of improving education even in the bucolic schools by providing the teachers of this province with tools, such as laptops and tablets that could succour teachers in the conveying of education. Because education is so important and was also accentuated by the late president Mr Mandela, every child is eligible to free education. That incited South African people working for the different companies to donate laptops for children in some schools of that province to augment education. Because teachers now are resourcefully equipped with the devices mentioned above, it is an educator of the Chris Hani District from this province of interest to the researcher. Hence, the study aims to examine teachers' knowledge of ICTs in curriculum practice, specifically in the bucolic schools, which is the title of this study. The study used four schools from the bucolic schools with eight educators as the participants. Daudi and Nzilano (2020:38) believe that many teachers positively perceive ICT integration in teaching and learning. Some of these teachers possess the knowledge and skills to use various ICT tools such as desktop computers, laptops, and smartphones. It is recommended that all educational parties work hand-in-hand for the knowledge of ICTs in curriculum practice and the knowledge needed by teachers first because they are the curriculum drivers. The study concluded that virtually all the participants were not familiar with many of the necessary ICT tools; they only knew those they were conversant with and which were accessible to them and more over the participants specified that they do have interests in the knowledge of ICTs in curriculum practice. However, due to unresolved conditions that hampered their interest, it made it difficult for them to apply their knowledge effectively on the use of ICTs hence infrastructure was the leading complaint which is a challenge to all the participants, since they are in the poor rural areas of the Eastern Cape Province.

**Keywords:** Information and communication technology, curriculum practice.

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## LIST OF ACRONYMS AND ABBREVIATIONS

|         |  |
|---------|--|
| APPS    | Applications   |
| BBT     | Born Before Technology   |
| CK      | Content Knowledge  |
| COVID   | Corona Virus Disease   |
| CPD     | Continuous Professional Development                                      |
| DVD     | Digital Versatile Disc   |
| EC      | Eastern Cape   |
| ECDoE   | Eastern Cape Department of Education                                     |
| EFL     | English First Additional Language  |
| GET     | General Education and Training   |
| ICT     | Information and Communication Technology                                 |
| ICT4D   | Information and Communications Technologies for Development              |
| ICT4RED | Information Communication and Technology for Rural Education Development |
| IT      | Information Technology   |
| ITEC    | Information Technology Centre  |
| LCD     | Liquid Crystal Display   |
| MoET    | Ministry of Education and Training                                       |
| MOOC    | Massive Online Open Courses  |
| MOODLE  | Modified Object Oriented Dynamic Learning Environment                    |
| MPI     | Multidimensional Poverty Index   |
| MTN     | Mobile Telephone Network   |
| NGfL    | National Grid for Learning   |

|         |   |
|---------|---|
| NITDA   | National Information Technology Development Agency      |
| OECD    | Organisation for Economic Co-operation and Development  |
| OER     | Open Educational Resources                              |
| PCK     | Pedagogical Content Knowledge                           |
| PCs     | Personal computers                                      |
| PCs     | Personal computers                                      |
| PK      | Pedagogical Knowledge                                   |
| RSA     | Republic of South Africa                                |
| SA      | South Africa  |
| SADTU   | South African Democratic Teachers' Union                |
| SMT     | School Management Team                                  |
| SSA     | Sub-Saharan Africa                                      |
| TALULAR | Teaching and Learning Using Locally Available Resources |
| TCK     | Technological Content Knowledge                         |
| Telkom  | Telecommunications                                      |
| TK      | Technological Knowledge                                 |
| TPACK   | Technological Pedagogical Content Knowledge             |
| TPCK    | Technological Pedagogical Content Knowledge             |
| TPK     | Technological Pedagogical Knowledge                     |
| TV      | Television  |
| VLE     | Virtual Learning Environment                            |

# CHAPTER 1 :

## ORIENTATION TO THE STUDY

### 1.1 INTRODUCTION

Huang, Liu, Tlili, Knyazeva, Chang, Zhang, Burgos, Jemni, Zhang, Zhuang, and Holotescu (2020:1) defined ICT as an arena resulting from the combination of information technology and communication technology, which is not only a strength to the world in terms of the information, but also as a significant facilitator and contrivance for prompting learning transformation, fluctuating the apprentices to be producers of knowledge. Obielodan, Omojola, Kazeemtijani, and Samuel (2020:1) argue that the knowledge explosion has improved learning through varieties of media, which has led to an advancement of human knowledge in the 21<sup>st</sup> century. Thus, the purpose of Information and Communication Technologies (ICT) is to sustain curriculum practice that cannot be embellished due to its importance in teaching and learning. Furthermore, effective ICT knowledge is affirmative in refining quality instruction delivery within and outside the classroom. In the end, there is not a single nation that can progress educationally without involving ICT knowledge in curriculum practice, including other ICT activities that are beyond teaching and learning. Hafifah (2020:186) argues that the term 'Information and Communication Technology' (ICT) was frequently used in the early 1990s when education started to facilitate the practices of the Internet, computer technology, and other telecommunication media into education locales, especially English Language Teaching (ELT) and the ICT Literacy Panel (2002). The afore-mentioned define ICT as the capability to practice, using ICTs to access, integrate, manage, evaluate, and create information to function in a knowledgeable society of which that knowledge is expected to be mastered by the teachers as the drivers of learning and teaching. Education structure everywhere in the world is in service of using Information Technology (IT) and Information and Communication Technology (ICT) for universalising education, improving the outreach of excellence in education and also making classroom teaching interesting, stimulating, motivating and effective (Patel, 2020:15). Ementa and Ezenwafor (2020:188) argue that the clout of technological innovations is a success in every province of a nation's development. Soh (2020:4) argues that the clout of ICT is vastly

different depending on how it is used. Information and communication technologies are part of this motivational school process. They are actively and dynamically present in every teaching-learning process, which contributes a large percentage to the proposed school activities, generating a relevant, positive impact on the population of students (Delgado & Moreno, 2020:51). Buah, Nomah, and Asah (2020:160) argue that teachers worldwide rely on the knowledge and the use of ICTs and their related technologies for curriculum practice. In recent years, there has been a significant enhancement in disseminating the knowledge and the utilization of ICT resulting in great positive impressions, both on societies and in everyday living. Hatlevik and Hatlevik (2018:2) argue that the current world's technological competency consists of updates and reports. Thus, the knowledge of ICTs is an essential ability that will assist in categorising information since our learners will be workers of those broadcasts in the future. Because of that, we as teachers must use ICT as we are the main people who must change educational processes and programmes by working together with the education department. Today children deserve to be equipped with the current technological knowledge and skills. Mwangi, Benson Njoroge, and Macharia (2020:164) argue that teachers should master technological Knowledge (TK) to understand how the ICT tools, resources and devices fit teaching. Kenna (2016:16-17) argues that technological knowledge consists of understanding the ordinary technologies and more innovative technologies, such as the internet and software. The knowledge of how to connect and use them is of significance. As mentioned in the above paragraph, therefore, in this study, the researcher explored teachers' knowledge of ICTs, particularly in curriculum practice. As we are about to move to the 21<sup>st</sup> century, learners have to be armed with the necessary skills that will be apt precisely for that century to deal with the educational situations of the 21<sup>st</sup>-century skills. The 21<sup>st</sup>-century global explosion in information and communication technology has devious implications for the increasing use of ICT in schools (Mireku, 2016:1). Some provinces here in South Africa have poorly performed in grade 12 results, resulting in a chain of blames like the FET teachers blaming the GET band teachers. Suppose learners from the GET band, especially the rural ones, are equipped with their teachers' current knowledge and skills. In that case, the school results could be improved because learners could use the ICT tools to research information through the internet. In any change, the attitude affected by the change is essential; therefore, the attitudes of teachers, learners, and parents should be considered. Snijders, van



der Duin, Marchau, and van Doorn (2018:14) argue that education still reflects being left behind concerning the knowledge and the implementation of ICTs, of which knowledge in education is seen to be obligatory, because of society's increasing demands for ICT expertise, due to the following reasons for this state of affairs: inadequate training, not enough impetus to change and a lack of government support. Katsarou (2020:41) argues that the effectiveness of the ICT is observable, as educators have facilitated learning techniques through the use of different approaches of teaching, such as student-centred rather than old-style ones. Students are motivated to participate more actively in the learning and facilitate assessment as they are no longer submissive receivers of knowledge. Therefore, the individual teacher as a learner is at the centre of educational change processes. Sarma (2020:1922) argues that the grim reality is that HEIs located in the rural areas of Assam are not proficient concerning knowledge in using ICTs for curriculum practice purposes. The outbreak of COVID-19 has made the community of teachers and learners accustomed to other methods like online delivery of content and creating videos of preferred subjects for the learners.

## **1.2 PROBLEM STATEMENT**

Buah *et al.* (2020:160) argue that the repercussion guarantees that graduates become digitally knowledgeable, enabling them to integrate ICT knowledge into the teaching and learning process. Teachers become aware of the need to know and integrate ICT into their teaching. Teachers are unaware of certain ICT aids, information is quickly accessible, and the teaching and learning process becomes exciting, making learners consume concepts with ease. The Department of Education has given some teachers in the African schools computers. Except for those computers, 12 schools were sponsored by companies like Telkom, ITEC and others, and those computers are to be used by teachers and learners. Also, recently Eastern Cape school principals were given tablets to be used by them. All these gadgets are lying unused in schools because teachers cannot use them since they lack the necessary knowledge and skills. Some of the teachers, including the researcher, only know how to type, print and save. It is difficult with the limited knowledge because they are unsure about themselves, thus lacking confidence. Using gadgets for teaching and learning is very

difficult for them. Some teachers, particularly those in the rural schools, have no or limited knowledge in the utilisation of ICT tools such as computers, tablets and televisions, especially for the educational issue and that resulted in them not using the gadgets in curriculum practice which is the main problem that made the researcher explore about teachers knowledge in ICT, particularly in curriculum practice. Even though they have cell phones, they only use them for regular personal use and not for educational purposes because they lack an understanding of how to use them. All those facts result in teachers losing interest in using the ICT tools and even avoiding them. Hatlevik and Hatlevik (2018:2) argue that learners or students also have personal cell phones. They have online networks knowledge; teachers must be the leaders in the knowledge of ICTs, particularly in curriculum practice, which can make it easier for them to transfer that knowledge to learners to enhance the knowledge learners already have. Liesa-Orús, Latorre-Coscolluela, Vázquez-Toledo, and Sierra-Sánchez (2020:2) argue that the potential offered by ICTs is not only instrumental and, from a practical point viewpoint but this must also be seen in the attainment of skills that consolidate meaningful learning that in turn allows insertion of science, modernisation and technology into education.

The following points may result in the poor knowledge of ICTs, particularly in the Eastern Cape teachers:

- Teachers in our schools, especially in the Eastern Cape Province, are overloaded as far as the subjects are concerned, due to the redeployment issues,
- Shortage of teachers,
- Learners live long distances away from schools, and that causes it to be complicated even to teach computer sessions in the early mornings or afternoons since they use transport that arrives in and out of schools at specific times.

Besides the knowledge of the computer basics, many teachers have no internet knowledge in rural schools, resulting in them struggling to acquire more knowledge for themselves and the educational practice. The rural person at large is struggling when they want help on computer-related issues. They have to travel long distances to reach and get to the internet café in towns or townships. Although these are the situations,

the little knowledge teachers have needs to be used in the educational practice to develop the students with the current knowledge and skills that will be very important for the coming 21<sup>st</sup> century, in order for them (students) to get better jobs.

### **1.3 THEORETICAL FRAMEWORK**

This study made use of the TPACK theoretical framework. Mishra and Koehler introduced this framework in 2006. Muianga, Barbutiu, Hansson and Mutimucuio (2019:81) argue that this model can be used to design an effective professional development program and educators or teachers widely use it is used to design and implement technology-enhanced learning. Andyani, Setyosari, Wiyono and Djatmika (2020:126-127) argue that TPACK is knowledge about how to expedite student learning from certain content through pedagogical and technological approaches, as it is considered as a potential framework that can provide new strategies for teachers in solving problems related to knowledge. It also assists in integrating ICT in curriculum practice and is an enactment in ICT in learning has a significant effect on the development of teachers' pedagogical competencies. Valtonen, Leppänen, Hyypiä, Sointu, Smits and Tondeur (2020:2824) argue that successful ICT integration in curriculum practice depends on teachers' knowledge of technology and pedagogical beliefs. The absence of the minute knowledge and knowledge itself as a part of the TPACK theory is a significant issue. It is a problem regarding the ICT tools and their exploitation in curriculum practice. TPACK outlines pre-service teachers' competencies to use Information and Communication Technology (ICT) in classrooms (Tondeur, Scherer, Siddiq & Bara, 2020:4). Mishra *et al.* (2006:1) argue that the TPACK framework was espoused because it fosters the technological competence of ICTs by teachers in curriculum practice. The digital competency of educators is a necessity. Alrwaished, Alkandari and Alhashem (2017:6116) argue that not only are teachers obligated to understand appropriate content knowledge, they also need to know how to deliver this content to their students. Hence, they need to acclimatise and update their technological knowledge to keep up to date with the changes of technological developments. Therefore, teachers must know the concept of TPACK, which will help them link their skills with content via technological means to produce integrated lesson plans. Mishra *et al.* (2006:2) argue that this framework has enabled

the assessment of digital competence levels in different subjects. Mishra *et al.* (2006:2) argue that this framework becomes a practical framework, capable of describing the multifarious interaction of technological, pedagogical and content knowledge, encircling these three areas simultaneously and comprehensively. Salas-Rueda (2020:1) argues that the TPACK archetypal is an outline that permits the construction of vigorous approaches for curriculum practice with the knowledge of ICTs. This framework allows the development of education and beyond.

## **1.4 RESEARCH QUESTION**

The primary exploration problem of this study was: How much knowledge and skills do teachers in the rural primary schools in the Eastern Cape Province in South Africa have in using information and communication technology in curriculum practices?

### **1.4.1 Sub-research questions**

- What knowledge of ICT in curriculum practice do teachers have?
- Why do teachers have no interest in the use of ICTs, particularly in curriculum practice?
- How do teachers use the ICTs in curriculum practice?
- What are the policy requirements regarding the knowledge of ICTs in curriculum practice?

### **1.4.2 Research objectives**

- To overcome the challenges or to find out what knowledge the rural school teachers (teachers as the drivers of the learning process) have on ICTs in curriculum practice.
- Encourage and to develop the interest in the knowledge of ICT tools and skills even in rural schools because ICT will be highly valued in the next century.
- To add the curriculum ICT knowledge to the teachers and learners, since they have knowledge of the social networks.

- To explore what the policy says regarding ICT in curriculum practice so that even the LSEN learners could benefit in their education by acquiring the ICT skills.

## **1.5 RESEARCH METHODOLOGY**

This segment described the methods to be applied in collecting and analysing data, which comprise different methods mentioned below. Ethical considerations, trustworthiness and credibility, was explained in this segment.

### **1.5.1 Research paradigm**

Kaushik and Walsh (2019:1) define 'paradigm' as the community's beliefs, knowledge, and values. Kaushik and Walsh (2019:1) argue that a paradigm refers to the fundamental beliefs that lead the research activities and explains the researcher's ethics. The term 'paradigm' was also used to discourse the common oversimplifications, theories and ethics of a community of experts vis-à-vis the nature of authenticity and knowledge. This, in turn, is described as a way of thinking about and making sense of the complexities and paradigms, which are theoretical and worthwhile "tools" that are used to solve specific research problems, meaning they function as heuristics in social research. Ling (2017:20) defines a paradigm as the ethics or a set of anticipations and indulgences about crucial facets of the exploration; the environs of authenticity or truth (ontology); the determined, integrities and ideologies of the researcher (axiology); the non-judgemental nature of knowledge and how it may be known (epistemology); the approach in how information is obtained (methodology); and the nature of the exploration consequences. The paradigm supporting a particular education research project or report may be embedded rather than obvious. Gunbayi (2020:39) argues that the interpretivist paradigm leads to various methods that consist of a qualitative inquiry-researcher where participants are talking together, creating a new authenticity. The interpretative paradigm was used in the study because this paradigm embroils the researcher and participants in the talking process.

### **1.5.2 The research design**

Williams, Boylan and Nunan (2020:3) define qualitative methodology as a term that refers to different research methodologies. Alase (2017:1) argues that qualitative methodology consents scholars to improve and use their skills in their investigation. Williams *et al.* (2020:3) further argue that this approach countenances scholars to examine teachers' experiences and provides practical, realistic perceptions into empirical matters and connotation, regularly clarifying the questions like 'how' and 'why' and involving the procedures for the collection of data in the participants' context. Data is collected through conversation in the form of an interview, discussion and observation of the participants' behaviour as they act to the phenomenon within their context. Due to the above-mentioned motives, the qualitative research design will be hand-me-down in this study.

### **1.5.3 Population and purposive sampling**

The population used in this study was eight primary school teachers from the rural schools of South Africa in the Eastern Cape Province in the Chris Hani District in Whittlesea. Primary school teachers were selected because teachers in this level or GET band replace the foundation of education, and they are the feeders of the high school teachers; therefore, they are the ones who must have enough knowledge in ICTs and their implementation. Beesley, Salvatore, Fritsche, Pandit, Rao, Brummett, Willer, Lisabeth and Mukherjee (2018:10) argue that a sample is known as the sub-unit of population, which connects the analogous features with the sample size as the number of units. The purpose of sampling (purposive sampling) is done by taking samples from the population based on specific criteria (Nasution, 2020:3). Rivera (2019:5) defines purposive sampling, or judgemental sampling, as when research calculatingly cherry-picks participants in a study, based on the participants' qualities and in corresponding with the study. For the purpose of this study and due to the facts mentioned above, purposive sampling was utilised. Etikan, Musa and Alkassim (2016:5) argue that in the purposive sampling technique, the identification of the participants is to be influenced by the qualities they have, which are relevant to the research topic.

Teachers were drawn from four rural intermediate schools. This was made up of 350 participants that formed the population of the study and had the potential to be interviewed since a purposive selection was employed to gather adequate and relevant information concerning the purpose of the study. The researcher is also the ICT coach in her school. The participants were identified according to their role in their schools, particularly in curriculum practice. According to their knowledge, the participants were contacted as far as ICTs is concerned. It did not matter how much knowledge they had, their interest in the knowledge of ICTs, particularly in curriculum practise, the availability of the ICT tools, teacher and learner access in the ICT tools and whether they used ICT tools even for personal issues, which was done to hasten up the process of sampling. Lamm and Lamm (2020:54) argue that non-probability sampling is not random, as people have to be willing to opt in or sign up to be a part of the project. Yang, Kim and Song (2020:2) argue that non-probability is beneficial in using this type of sampling. Hence, it provides opulent information about the target population and can be theoretically supportive for predetermined population interpretation. Due to the above facts, probability sampling was used in the study.

#### **1.5.4 Research method**

Williams *et al.* (2020:3) define qualitative research as a word that includes the use of documented data to explore denotation and viewpoints of phenomena. Evans and Lewis (2018:2) argue that qualitative semi-structured interviews are the foremost data collection approaches because they tolerate researchers exploring subjective perspectives and gathering people's experiences. Hawkins (2018:493) argues that because semi-structured interviews primarily conduct face-to-face interviews, they excel in data collection; hence they also allow the use of advanced technology and therefore also multiple options such as telephone, videoconference, email, and text message. Due to this, interviews were used in this study. Because of the above-said motives, semi-structured interviews were used in this study.

#### **1.5.4.1 Interviews**

Teachers from four rural schools of the Chris Hani District were interviewed to understand their knowledge of ICTs, particularly in curriculum practice. Mergel, Edelmann and Haug (2019:1) argue that interviews were conducted with experts in digital transformation projects on the government levels and the IT service providers. Semi-structured interviews, as previously indicated, and the focus group were utilised in the study. The researcher used the open-ended general questions, the specific questions, and the probing questions to allow the participants to expose their competencies on the knowledge of ICTs, particularly in curriculum practice. Montreuil and Carnevale (2018:6) argue that issues of interest, based on their understanding and knowledge in ICTs to provide supplementary background information, were also part of the formal interviews with the participants, and sensitive topics were sensitive topics side-stepped as they would have distracted the emotions of the participants. After the course, the participants were interviewed using this method, and these interviews were recorded using a voice recorder (Uzun, 2020:32). During the interviews, the participants were voice recorded to ensure data backup. Data were analysed and interpreted using different documents to interpret the research study. The investigator went the extra mile by reviewing the literature to understand the views of other scholars on the knowledge of ICTs, particularly in curriculum practice.

#### **1.5.4.2 Data analysis**

Bernard (2017:453-454) defines analysis as the examination of information and ideas that assist in clarifying why that information is given; hence it is also the outline of the qualitative and quantitative analysis, and it needs to be considered before the collection of data and so it is also a component of the research study. Moser and Korstjens (2018:17) argue that qualitative analysis commences with organising data into smaller and manageable units, which can be salvaged and reviewed easily. Large amounts of data need to be stored. Dalkin, Forster, Hodgson, Lhussier, and Carr (2020:1) argue that this type of data analysis was of good support in data analysis in several methodological fields, including grounded theory interpretative phenomenological analysis valuable in qualitative research. Lester, Cho and Lochmiller (2020:96) argue that qualitative data analyses, which includes a wide range



of materials, e.g. conversational data, semi-structured, or structured interviews, is often aligned with a particular methodology, theoretical perspective, research tradition, and/or field brings meaning to a data set. Several procedures of qualitative data analysis, even those with different epistemological reinforcements, are used to understand mutual reality.

Noble and Heale (2019:67) argue that methodological triangulation encourages the use of several data collection methods, such as interviews and observations. This method was presented by Denzin (1970), and it will be used in the analysis of data because it embroils research methods, which are the interviews to be used in the collection of data. All participants gave their written informed consent to participate in this study.

### **1.5.5 Literature review**

Queiroz, Ivanov, Dolgui, and Wamba (2020:4) argue that the literature review summarises the results of current studies and evaluates constancy among the studies mentioned above. The researcher also reviewed the relevant textbooks, articles from peer-reviewed journals and other relevant sources. The change of attitudes of the educational parties was vital because some of them have a negative attitude toward using the technological devices due to a lack of knowledge on how to use them. Even teachers with basic knowledge on the use of ICTs gaps that may negatively affect the knowledge of ICTs will be advanced. Fisch and Block (2018:103) argue that a literature review is a necessary element that can be successfully implemented in any research study since it is the basis in the progression of knowledge that equips theory enhancement.

Moreover, it preserves fully-fledged research measures, exposes innovative research areas, and recognises the plan that scrutinizes and produces erstwhile literature. Hence, literature reviews are so widespread and significant in the guidance of scholars in the research study. Hart (2018:1) argues that fundamentally a review of the literature is imperative because it assists the researcher with the understanding of the topics already researched and the way they have been researched. Without it, the understanding of the research topic will not be comprehensible.

### **1.5.5.1 Document analysis**

Chinedu and Mohamed (2017:207) argue that document analysis is a systematic technique for analysing or examining documents, printed and electronic material. They require that word-based data, confined in pertinent documents, be analysed to get meaning. Apolo, Melo and Solano (2020:131) argue that the content analysis was executed according to the perspective of the biopic and bibliographic materials collected, carefully studying the documents through a controlled hermeneutical interpretation. Document analysis consisted of The White Paper on E-Education (2003), Managing ICTs in South African Schools (Bialobrzaska & Cohen, 2005), E-Education Policy (2003), ICT 4 RED Training Material and the Department of Basic Education Reports.

## **1.6 RECTITUDE OF THE STUDY**

### **1.6.1 Trustworthiness and credibility**

Grosser, Hase and Wintterlin (2019:4) defined trustworthiness as a behavioural trait, namely the “willingness of [the trustor] to be vulnerable to the actions of [the trustee], especially in situations in which a trustor perceives a risk and can therefore also be described as the willingness to take a risk”. Nyirenda, Kumar, Theobald and Sarker (2020:2) argue that trustworthiness in qualitative research should be embedded in a robust perceptive of the confined background, the investigators’ prestige and advanced sequentially through diverse disks of shared conversations. Schiemann, Mühlberger, Schoorman and Jonas (2019:166) defined trust as it depends not only on one’s own willingness to trust but also on the interaction partner’s trustworthiness in the situation as in this definition, both twists and their interdependence within a collaboration are taken into account. Gill, Roulet and Kerridge (2018:8) argue that trustworthiness compares to a scrutineer building their study executions noticeable, and consequently ascertainable, assisting others to advance a better-off understanding into how their discoveries were formed. Nyirenda *et al.* (2020:2) argue that credibility concerns how congruent findings are with reality. The approaches include prolonged engagement, triangulation, saturation, rapport-building, iterative-questioning, member-checking, and an inclusive coding approach to develop credibility. The themes are coded iteratively rather than reduced to fit predetermined

criteria and reflexivity. Kyngäs, Mikkonen and Kääriäinen (2019:42) argue that trustworthiness scrutinises if readers of the research trust what the authors are reporting. Trustworthiness involves carrying out the study to ensure that readers will believe the presented findings and take steps to validate credibility in research reports and whether a researcher's confidence in presenting truthful results. Makinde (2018:19) argues that the notion of credibility has been well-thought-out in the broader intellect by suggesting whether a user can trust the provision of the provider or even the information itself. Liang and Ploderer (2020:2) argue defined credibility as plausibility, i.e., whether an individual observes ICT tools as reliable and as built on proficiency. Yulianti, Putri and Hamdan (2020:235) argue that credibility is the perception that the researcher has some things essential to offer, specific knowledge and information, which will benefit teachers as the drivers of teaching and learning. Relating Machiavelli's advice to credibility in the public area, one may formulate the following principles: 1) one should avoid such kind of (moral) credibility that makes it impossible to fulfil one's objective; 2) one should avoid being not credible only if it makes it impossible to achieve one's objective; 3) not keeping one's word may always be legally justified; 4) even what is the most unreliable is credible to someone; 5) it is not necessary to be credible, but it is necessary to appear credible (Mazur & Duchlinski, 2020:56). Therefore, trustworthiness and credibility will be utilised using two data capturing methods, such as audiotaping and dictation of interviews.

## **1.7 ETHICAL CONSIDERATIONS**

Menon and Alexander (2020:11) argue that the principles, such as trustworthiness, integrity and the public interest, accuracy, rigour, fairness and objectivity are the professional, ethical principles to be followed precisely by teachers. Head (2018:4) argues that a School of Education Ethics Forum involves education researchers, which analyses applications from undergraduate and postgraduate Master's level students. In the application for the ethical clearance certificate to conduct the interviews, the researcher followed the correct procedures and regulations of the ethics committee and waited till the ethical clearance certificate was received that will countenance the researcher to conduct the interviews. Once received, the researcher made sure that the participants remained anonymous. Participants were made aware of any risk

factors and completed and signed the consent forms. The participants were not forced to engage themselves in the research activities. As the researcher resides near the Walter Sisulu University and the University of Fort Hare, letters of introduction were asked by the researcher to be presented to these universities to register as a library user if necessary.

## **1.8 DEMARCATION OF THE STUDY**

### **1.8.1 Geographical region**

He, Glasser, Pritchard, Bhamidi and Kaza (2020:1) argue that geographically South Africa is demarcated according to provinces which consist of regions consisting of different humanities and economic prestige. For the purpose of this study, some teachers are fortunately living or working in the towns of the Eastern Cape Province, and they are exposed to the different types of ICT tools and have access to internet cafés as well. In contrast, there are those working or living in the rural areas of the same Province. They are disadvantaged because some of them are not familiar with the knowledge of the ICTs, particularly in curriculum practice by creating territorial administrations. However, all depend on the economy or the financial status of each area, of which rural schools suffer financially due to the low numbers of learners and the abysmal infrastructure. This study was conducted in the Eastern Cape Province in the Chris Hani District rural schools. Four primary schools were identified with one principal and one teacher and were dealt with in this study. Selection from those schools was not a problem because the schools are also from the same group of the researcher.

### **1.8.2 Scientific demarcation**

Fernandez-Beanato (2020:375) mentions two types of scientific demarcations: epistemic warrant and territorial scientific demarcations. In this study, this happened automatically due to the condition of the territories the teachers are employed in. Fraillon, Ainley, Schulz and Friedman (2020:175) argue that accessibility of ICT tools in some countries is not equal in schools, resulting in several teachers having no or little knowledge in implementing ICTs in curriculum practice. Halili, Sulaiman and

Razak (2017:2) argue that almost all rural societies in the world have no internet access, which is necessary to inspire them in the knowledge in ICTs and have not understood any benefit in the advantages of using ICT since they do not have internet access. Malaysia has introduced various programs to provide internet access in rural areas, to cite an example. Even though the rural community has begun to receive ICT technology development, problems or factors influencing ICT development in this area are still difficult to overcome completely. Consequently, the researcher tried to balance the outdated approach of teaching and learning with the modern techniques that involve the knowledge of ICTs, particularly in curriculum practice, and that must affect predominantly rural schools. Consistent with the scientific demarcation, the study also fixated on the policy requirements that knowledge and the implementation of ICTs by teachers, which is of more concern since we live and breathe technology during these modern years and days.

## **1.9 VALUE OF THE STUDY**

Knowledge of ICTs is vital, particularly by teachers in these days of the pandemic disease where learners and teachers were not permitted to go to school because of the COVID-19 regulations. This study will help teachers, particularly those in rural schools, learn ICTs in teaching and learning to proceed with online teaching. This study is appropriate, especially in progressive times, because it emboldens teachers' knowledge of ICTs and the ability to use them in curriculum practice. Teachers will make use of the personal knowledge they have in ICTs and be able to put that knowledge into practice. Teachers will be able to proceed with teaching and learning even online, which will help equip the learners with the essential skills of the 21<sup>st</sup> century. Once teachers master this knowledge, they will be able to transfer it to learners, even those living in rural areas. They will be equipped with the necessary essential skills of using the technological tools for educational issues and not only for fun. The study centred on the construction of the theoretical and empirical understanding of the knowledge of ICTs, particularly in curriculum practice. Learners will be equipped with the necessary vital skills of using the technological tools for educational issues and not only for fun.

## 1.10 ORGANISATION OF THE STUDY

The study is organised according to the structure that follows:

**Chapter One:** Is about the orientation and background of the study.

**Chapter Two:** Presents a rational theoretical framework, conceptual framework and the pertinent literature review.

**Chapter Three:** Deals with research design and methodology and the data analysis method.

**Chapter Four:** Reports on the perceptions and experiences of rural teachers concerning the knowledge of ICTs in curriculum practice.

**Chapter Five:** This chapter includes the summary of the findings, conclusions, recommendations and suggestions for further research.

## 1.11 SUMMARY

Orientation and the background of the study to the research study and an overview of the all-inclusive study have been apportioned with and incorporated in the outline of the study. Motivation, the problem statement, and the study's objectives were clearly explained in this chapter. The researcher identified the theoretical framework and the research design and methodology, and the reasons for this were also meticulously explained in this chapter. Limitations, the study's value, and the study's integrity were also explained. Ethical considerations, conclusions and references were also done automatically. Rural school teachers and the setting where the study took place in the rural schools of the Chris Hani District in the Eastern Cape Province in South Africa was also highlighted.

## **CHAPTER 2 :**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

Chapter one outlined what the researcher wishes to research concerning exploring teachers' knowledge in ICT, particularly in curriculum practice in rural primary schools. This chapter gives the views and ideas of other researchers exploring teachers' knowledge in ICTs, particularly in curriculum practice. Onwuegbuzie and Weinbaum (2017:359) argue that the literature review has turned out to be the utmost reciprocated technique of gaining understanding and frequently lays the trajectory for a study (Onwuegbuzie & Weinbaum, 2017:359). Hart (2018:13) argues that the literature review is integral to the success of academic research. A significant value of the review is that it safeguards the researcher's ability of the topic before 'proper' research commences.

Moreover, the progressiveness of the topic also depends on the literature review because the literature review also assists in the pragmatism of the research project. Initially, writing a literature review reveals the author's knowledge of a particular field of study and informs the students about the influential researchers. Spiteri and Rundgren (2020:115) argue that the objectives of the literature review are to scrutinise the dynamics that affect teachers in ICT knowledge in teaching training to suggest enhanced training that may lead to quality knowledge and the implementation of ICTs in education at large. For the sake of this study, the literature review aimed to explore teachers' knowledge of ICTs in curriculum practice. Schryen (2015:2) argues that literature review is essential because of the following. First, it supports theory improvement and research reforming, exposing research gaps and unrecognised expectations underpinning research. Secondly, it helps students become conversant with their thesis topic and associate the problem statement with the research questions. In the case of this study, the literature review specifically responded to the following angles or sides of the research questions in correlation with the ICT teachers.

- a) What knowledge of ICT in curriculum practice do teachers have?
- b) Why do teachers have no interest in the use of ICTs, particularly in curriculum practice?
- c) How do teachers use the ICTs in curriculum practice?
- d) What are the policy requirements regarding the knowledge of ICTs in curriculum practice?

Terms used by the researcher in this study were defined in this chapter to help explain the study. This section explored the guiding theoretical framework sustaining the studied phenomenon and the literature relevant to the knowledge of ICTs by the rural schools' teachers. TPACK domains, as the designers of the pertinent literature review, were examined in this section. The chapter examined the ICT capacity to support innovation in this chapter. The following research question was answered: What knowledge do teachers have concerning information and communication technology in curriculum practice? This section scrutinised the ICT policy requirements held by teachers in different countries and the School of Ecology and Management Support from outside agencies. This chapter considered the various factors that different writers have advanced as affecting teacher knowledge of ICTs in curriculum practice. It also discussed the various technology adoption theories and identified the theory on which this study was based. Mireku (2016:2) argues that the gap between the knowledge of ICTs in educational settings and the current level of ICTs knowledge by learners have encouraged researchers to focus on teachers and the difficulties they encounter in the knowledge of ICTs in curriculum practice. Teachers need to explore ICT knowledge in curriculum practice to expose or identify their weaknesses and strengths in applying ICT in teaching and learning.

The following sections were dealt with in this chapter:

- Theoretical framework;
- Teachers' knowledge of ICT in curriculum practice;
- Use of ICT tools by teachers in curriculum practice;
- Why do teachers have no interest in the use of ICTs in curriculum practice?  
and
- ICT policy requirements to be possessed by teachers.



## **2.2 DEFINITION OF CONCEPTS**

Concepts used in the title of this study were defined to help the reader understand the study. The researcher used the concepts that are relevant to the study.

### **2.2.1 Teacher knowledge**

Nielsen and Lund (2020:12) argue that knowledge in the comprehensive sense includes both theoretical and technical knowledge, as well as categorical knowledge and personal, as well as public knowledge, and it is often referred to as factual and logically organized ideas, from 'beliefs,' referring to something people feel to be true. Dong, Wang, Yang and Kurup (2020:3) mentioned three forms of teachers' knowledge: propositional knowledge, which is stored in a statement of teaching and learning principles, case knowledge, which is a kind of knowledge that describes specific teaching and learning and strategic knowledge, which is used to solve problems or conflicts encountered in teaching and learning activities. The researcher heard about the veracity of the ICT knowledge of teachers in teaching and learning and investigated why they do not have an interest in the knowledge of ICTs and what they do to solve the challenges of the poor knowledge of ICTs, particularly in curriculum practice. Mónico, Mensah, Grünke, García, Fernández, and Rodríguez (2020:3) argue that it is accentuated that teachers need to advance both a precarious consciousness of knowledge, as well as the abilities for enacting knowledge and for constructing knowledge, and they are more likely to sustain positive attitudes when they have the appropriate knowledge in ICT. Tunjera and Chigona (2020:127) regard TPACK as an excellent model to expose teachers to ICT knowledge and use in teaching and learning.

### **2.2.2 Curriculum practice**

Deng (2017:4) describes curriculum as categorising specific components that provide teaching and learning performance guidelines. Moreover, it should be mastered by teachers to transfer excellent knowledge to learners. That could be effective when accompanied with ICT knowledge to develop education. Alsubaie (2016:106) argues that curriculum consists of different subjects, and it is a valuable contrivance that can

assist teachers in the augmentation of improved approaches in curriculum delivery. Cahapay (2020:4) argues that curriculum objectives must be accentuated in an innovative way to improve learners' proficiencies. Parmelee, Roman, Overman and Alizadeh (2020:2) argue that a curriculum strategy should generally emphasize spaced repetition and interweaving of the content and frequent testing, allowing their abilities and teachers to understand better what students know and do not know. Hall and Smyth (2016:9) define curriculum as a framework of knowledge to be conveyed as product, as the means to attain certain culminations in/by students; as a process of interaction between teachers, students and knowledge curriculum habitude. Jabbarova (2020:4) argues that the curriculum includes the plan prepared for learners based on education, and it also includes the school essence, themes, interdisciplinary learning and the prospects for distinct accomplishment. Encyclopaedia describes the curriculum as a classification of theme components organized so that knowledge of each component may be accomplished as a solitary act. Learners have earlier learned the capacities defined by specific previous components (in the categorization). Muleya (2020:3) argues that the revised curriculum encourages self-motivation, self-learning, self-assessment, independent learning, accompanied by values, skills and knowledge that can support confidence and enable them to succeed in life. Teachers must initially recognise knowledge, self-motivation, and confidence to help students attain all these lifelong requirements. Van de Oudeweetering and Voogt (2018:116) argue that the curricular guiding principle, by chance, can primarily support teachers' organisation when they correspond to their desires and judgements of their specialised contexts. This implies that a close configuration between the written curriculum and teachers' perception of their professional responsibilities can help to improve teachers' agency and, in addition to that, the realization of curricula. This is essential for their elucidation of the curriculum, as it includes task acuties and knowledge that support their professional actions. Therefore, curriculum practice involves all the actions enabled in the successful curriculum implementation.

### **2.2.3 Information and Communication Technology (ICT)**

Encyclopaedia defines ICT as tools that open the gates to information by using the different types of technological devices like computers, the internet, radios, television,

and so on. Alagu and Thanuskodi (2018:3) describe ICT as a thrilling and developing tool, providing teachers with the enduring knowledge and skills, allowing the schools to be educationally advanced, equipping the teachers and the learners with enduring skills and leaving the possibility for the educational parties to be creative enough by using it in different technological activities. Salem and Mohammadzadeh (2018:2788) argue that ICT is adopted in a general explanation to involve computers and also the most corporate brand of computer-based technologies, such as laptops, tablets, smartphones, and software, as well as internet-based technologies, comprising of email, websites, and social networking sites, for instance, YouTube. Alshmrany and Wilkinson (2017:143) believe that ICT commonly denotes the miscellaneous set of technological tools or resources used to connect, create, broadcast, store and manage information. Agabi, Agbor, and Ololube (2015:107) argue that ICT basically refers to applying technology, particularly in schools, influencing teachers and learners to attain knowledge. Moreover, it accelerates the accomplishment of educational objectives and improves precarious literacy, including technological literacy amongst teachers and students, using computer-based teaching and learning. Hove and Grobbelaar (2020:48) argue that The South African Government has acknowledged ICTs to be prospective in advancing the delivery of excellent education for all, and that is accentuated by the South African Education ICT White Paper (RSA, 2004), which highlighted the following:

*“Learning through the use of ICTs is arguably one of the most powerful means of supporting learners to achieve the nationally stated curriculum goals, and in particular, the use of ICTs for learning encourages: learner-centred learning; active, exploratory, inquiry-based learning; collaborative work among learners and teachers; and creativity, analytical skills, critical thinking and informed decision-making, and as with other types of organisations, schools and school systems are increasingly using management information systems for planning, monitoring, improvement and accountability purposes, ICTs have the capacity to automate processes and save time, thereby freeing managers to focus on instructional leadership” but knowledge of ICTs is the most forefront issue to be mastered by teachers.”*

Information and communication technologies are viewed as a means of facilitating comprehensive educational transformation in South Africa (RSA, 2016). The term ICTs include a broad range of technologies. Chinapah and Odero (2016:108) argue that ICTs have been materialised as resources that can augment malleable education

alleyways through informal and formal schooling. Chinapah and Odero (2016:108) argue that ICTs have the prospective to upsurge justifiable ingress to excellent knowledge, which is necessary for skillfulness improvement. The importance and the role of ICT in curriculum practice is educational realism because it is used as an aid in curriculum practice. Mireku (2016:34) argues that ICTs magnify the admittance to education and support education's prominence.

#### **2.2.4 Curriculum**

Steiner (2017:4-5) defines curriculum as the knowledge and skills students are expected to learn from teachers, comprising the learning criteria or learning objectives; the units and lessons that teachers implant; the assignments and projects given to students; the books, resources, videos, presentations, and interpretations used in a course; and the examinations, assessments, and other approaches used to assess learner knowledge (Steiner, 2017:4-5). Wall and Leckie (2017:36) further explain that curriculum encompasses what happens in the school and other school activities and programs. Kim (2016) argues that curriculum sequencing means the organization of learning components, i.e. courses, in an opposite order so that students can study their subject areas and learning tasks. Alsubaie (2016:106) argues that an authentic curriculum reflects the thinking, objectives, learning experiences, instructional resources, and assessments that embrace authentic learning and can be subject-specific or a comprehensive overview of expectancy. McLachlan, Fler and Edwards (2018:11) argue that curriculum is defined as a comprehensive document, a school-based document, or a document for a geographically defined area more significant than a school, but smaller than a country and is likely to be made up of four essential elements – aims, content, method and evaluation/assessment. However, what governments or society at large want for its youngest citizens will fluctuate, depending on the community. Alsubaie (2016:106) further argues that curriculum must be an operational tool that can assist teachers in improving educational approaches with the use of adequate resources. Jabbarova (2020:2) argues that curriculum is the themes included in the course of study or taught in a school offered by an educational administration. The importance of curriculum planning is the development of well-coordinated, quality teaching, learning and assessment programs, which build

students' knowledge, skills and behaviours in the disciplines, as well as their interdisciplinary and physical, personal and social capacities and is very useful to educators who wish to improve student learning technologically. For the purpose of this study, Capuk (2015:1) argues that some of the curriculum models define the content of a curriculum as the knowledge and the use of ICTs, or to an academic subject that needs to be taught.

In contrast, other scholars refer to ICT as a subject of instruction, of which in some of the curriculum models, ICT will be presented as an academic subject that needs to be taught. ICT will be used as a method of instruction, and at the same time, ICT will be a mix of previous models, which will be referred to as a content supporting subject matter. Aliyyah, Rachmadtullah, Samsudin, Syaodih, Nurtanto and Tambunan (2020:91) argue that vicissitudes in learning systems made many deviations in schools to such an extent that teachers have to implement online learning, e-learning, correspondence education, flexible learning, and substantial open online courses (MOOCs) that will assist teachers in the knowledge of ICTs. Petrinšak and Pinjušić (2020:257) argue that a curriculum must be in line with such changes, and preparation and revision of the curriculum require the use of ICT.

### **2.2.5 Rural**

Lelon, Odero and Agalo (2018:248) argue that the "rural" is envisioned to mean places with different rural physiognomies and extremely underprivileged people marginalized technologically. Chinapah and Odero (2016:109) argue that the global Multidimensional Poverty Index (MPI) 2014 derived from education displayed that 85% of the underprivileged societies, across 105 nations, lived in rural groups with no adequate equipment. Zinger Sandholtz and Ringstaff (2020:14) argue that rural schools and districts tend to be smaller in terms of the number of students served but are also in communities that are sparsely populated, that are spread over vast areas, and that makes teachers to be overloaded with many subjects to be taught as the schools tend to be located in remote areas and experience instability in student enrolment, due to economic shifts, which resulted in a lack of resources like the ICTs, in particular, that would be able to equip teachers with technological knowledge which would be transferred to the learners for future use or help them to learn even during

the emergences, which may lead to the closure of schools due to lockdown. Botha and Herselman (2016:3) argue that teachers in rural schools, although interested in using ICTs, lack the pedagogical and technological knowledge. Therefore, their computers are stuck in schools because they lack technological knowledge, so the researcher studied their knowledge in ICTs.

### **2.3 THEORETICAL FRAMEWORK**

Kivunja (2018:46) argues that the theoretical framework encompasses the concepts enunciated by specialists in the arena you plan to investigate. Swanson and Chermack (2013:122) define a theoretical framework as a design that recaps the theories, and the thesis progressed from earlier verified and issued information incorporated to support the researcher to have a theoretical lead or foundation for the research data analysis and clarification of the meaning enclosed in the investigated data.

Ngulube (2018:1) argues that theoretical frameworks function as an adhesive that holds constituents of the research study together. Without it being adhesive, the research design will fall apart because it gives direction to first-hand research and suggestions. “Knowledge accumulation simply cannot occur without a conceptual framework” “The theoretical framework is the structure that can hold or support a theory of a research study” (Kivunja, 2018:46). Qasem and Nathappa (2016:265) argue that erstwhile studies have indicated the eminence of ICT knowledge as a life-threatening issue among teachers’ ICT preparedness to utilise ICT in curriculum practice in their academic backgrounds for teacher knowledge. Rousey (2020:8) argues that the Technological and Pedagogical Content Knowledge responds to the ultimatums experienced by teachers. Therefore, TPACK was used in this study to explore teachers’ knowledge in ICTs in curriculum practice in rural schools to identify the challenges encountered by the teachers in rural schools. In one way or another, some of them will be motivated to learn ICTs, and even those with basic knowledge might try to apply the little knowledge they have in teaching and learning.

### **2.3.1 Historical background of the theory**

Some teachers in rural schools are still using the chalks and blackboard to write learner activities and use pens and papers to write their planning and assessments. It becomes a challenge to some teachers as they do not have time for this because most of them live far away from their work. Therefore they reach their houses at night-time. That makes them fall behind in their work, particularly in planning, and that causes misconstructions between them and their officials. Gür and Karamete (2015:778) argue that the researchers have recognized the dearth of satisfactory hypothetical and expert plans that convey support, direction and proficiency to educators in integrating ICTs in curriculum practice. TPACK (sometimes written as TPCK) is an augmentation of the Pedagogical Content Knowledge (PCK) framework, proposed by Shulman (1986) to facilitate knowledge growth in teaching (Ntšekhe, Terzoli & Thinyane, 2014:277). Andyani *et al.* (2020:126-127) argue that TPACK is a technological knowledge about how to perform curriculum practice to student learning from certain content and is reflected as a prospective framework that can assist teachers in solving problems related to knowledge of ICT into teaching and learning activities in the classroom through pedagogical and technological approaches. The theory began to gain widespread popularity in 2006 after Mishra and Koehler's (2006) seminal work, outlining the model and describing each of the central constructs. Wang (2016:14-15) argues that TPACK was presented to the educational research field as a theoretical basis in understanding teacher knowledge in ICTs. It centres on the necessity for educators to expertly prove their knowledge in implementing ICTs. Hosek (2018:19) argues that TPACK as a theoretical framework allows for the dynamic nature of technology knowledge. To the researcher, technological knowledge can also be functionally effective in curriculum practice. TPACK framework is an augmentation of the knowledge domains for teaching. Apau (2016:14) argues that this framework helps theoretically with the knowledge base required by teachers, and it appears to assist in the human collaboration required in this study transfer. The theoretical knowledge of teachers on the different types of ICT tools and how they operate and use them was examined in this study.

### 2.3.2 Principles of the theory of TPACK

TPACK is a framework designed by researchers to help teachers map their professional knowledge and prompt self-reflection through meta-conceptual awareness (Krauskopf, Foulger & Williams, 2018:154). Glowatz and O'Brien (2017:2) argue that the TPACK framework is a convenient tool for exploring the fundamentals required for effective teaching with technology. Salas-Rueda (2020:2) argues that TPACK is a framework of reference that emphasises the conception of dynamic approaches in curriculum practice using ICT knowledge. (Urban, Navarro & Borron, 2018; Ozudogru & Ozudogru, 2019) Further argue that the application of technological, content and pedagogical knowledge allows the creation of new computer-generated educational spaces. The TPACK model originally comes from the philosophies that include ICTs. Technological Pedagogical Content Knowledge (TPACK) has been transformed into a robust framework to support ICT integration in practice by allowing instructional designers, teachers and teacher educators to focus on real instructional-learning contexts (Jimoyiannis, 2015:1). This is supported by O'Brien *et al.* (2015:3) that this theory was formulated for teachers to help them comprehend the knowledge base of teaching resourcefully with the digital technologies; hence they are more practical. Brill, Elliott, Listman, Milne and Kapila (2019:1) argue that the TPACK framework accentuated teachers' knowledge and use of ICTs to advance learners' mastery of the subject. They are expected to have more knowledge than the learners in curriculum practice. The TPACK framework provides a professional knowledge structure that signifies that teachers need to understand and know many things and simultaneously reflect on their knowledge and understanding to develop professionally (Krauskopf *et al.*, 2018:154, 156). Voogt and McKenney (2017:10) argue that ICT knowledge in the curriculum is necessary because it supplements what is currently taking place in regular education. Harris, Phillips, Koehler and Rosenberg (2017:6) argue that a TPACK framework is broad-minded upon representations of teachers' knowledge in action. They have to use the ICT tools practically, leading to specific technological pedagogical curriculum-based decisions. Taopan and Drajeti (2020:5-6) argue that TPACK is a good framework in teaching with technology, as it requires an understanding or the knowledge of the notions of technology usage. Secondly, it presents educational skills that use technologies or ICTs, developing knowledge in curriculum practice. Finally, it represents students'



basic knowledge, theories of epistemology, knowledge of how technologies can be used to figure out existing knowledge and develop a new theory of knowledge or strengthen old ones.

### **2.3.3 Successes and the limitations of the theory**

#### **2.3.3.1 Successes of the theory**

Bueno-Alastuey *et al.* (2018:3) argue that TPACK is the most comprehensively used and accepted framework to explore the knowledge base needed for teaching. It offers the connections between the three different types of knowledge. Furthermore, the framework has been successfully applied and validated to assess and bolster teachers' capacity for ICT integration to measure teachers' understanding of technology. Soomro, Soomro, Ali, Bhatti, Basir and Gill (2018:203), Krauskopf *et al.* (2018:153), and Mishra *et al.* (2006:1029) argue that TPACK is a starting point for teachers in the knowledge of ICTs. Hence, many researchers have found this framework an advantageous device in exploring teachers' knowledge in ICTs, particularly in curriculum practice. The TPACK framework seeks to assist in developing better techniques for discovering and describing how technology-related professional knowledge is implemented and instantiated in practice (Hosek, 2018:19). Glowatz and O'Brien (2017:3) argue that the TPACK framework, conversely, allows for the consideration of different social networks, particularly Facebook in the teaching perspective, by outlining a multifarious collaboration amongst the three areas of the content knowledge, pedagogy and technological knowledge, which together produce the category of "malleable knowledge" necessary to assimilate ICTs in curriculum practice. Karaca (2015:130) found that teachers' use of various technologies made a difference in their TPACK level. The implementation of ICTs by teachers increased, which made an increase in the TPACK level. Brill *et al.* (2016:5) argue that teachers, through TPACK, demonstrated an increased understanding of ICTs, the value of the knowledge of technology and the constructive ramifications. Botha and Herselman (2016:3) argue that the TPACK framework forms the base of ethical teaching with technology and necessitates understanding certain notions using technology or ICTs. Peng and Daud (2015:572) found that teachers in the TPACK components without technology like CK, PK and PCK were more self-confident than the TPACK with

technology like TK, TCK, TPK and TPACK. The results showed that the ability of TPACK has a vital role in improving the ability of pre-service teachers in the 4.0 industrial revolution (Nursyifa, Rahmadi & Hayati 2020:15). Arifin, Nurtanto, Priatna, Kholifah and Fawaid (2020:787) argue that most scholars regard TPACK as a good unconventional framework in the knowledge and the use of ICTs, particularly in curriculum practice; hence it accomplishes learning effects. Bueno-Alastuey, Villarreal and García Esteban (2018:3) argue that this framework (TPACK) has been successfully applied and validated to assess and bolster teachers' capabilities in the knowledge. The use of ICTs highlighting the teachers' knowledge and use of ICTs has been revealed to improve after TPACK development efforts (Mishra & Koehler, 2006). Researchers have demonstrated that teachers with appropriate TPACK skills tend to use technology to improve or supplement the current curriculum and provide an enhanced pedagogical approach.

### **2.3.3.2 Limitations of the theory**

Glowatz and O'Brien (2017:134) argue that due to the features of digital technology, they present challenges from a teaching viewpoint, and some of those glitches might embrace the use of Facebook for educational purposes. Hence they further argue that the task of espousing technology into teaching can be both intricate and grim. Rohman, Widowati and Azman (2020:338) argue that in TPACK, the realities have indicated that most teachers lack adequate knowledge and abilities, irrespective of being acquainted with the ICT tools. Alhababi (2017:7) and Soomro *et al.* (2018:204) argue that teachers generally were unmindful or incapable of assimilating ICTs with curriculum practices, mainly English as a subject because it has no direct link with technology. Alhababi (2017:7) further argues that teachers in Saudi reported that they were lacking the training to integrate technology in teaching English in teacher educational and professional development programs. Krauskopf *et al.* (2018:159) argue that although educational technology courses may be included unsystematically in teacher training, the TPACK framework was not part of teacher training. Teachers had no specific technology emphasis in their professional tasks at some schools. Therefore, TPACK's capabilities need to be upgraded and supported by various parties to create an education that can produce future qualified teachers (Nursyifa *et*

*al.*, 2020:15). TPACK first appeared in learning with technology in scientific knowledge concerning Mishra and Kohler (Arifin *et al.*, 2020:443-444). Schmid, Brianza and Petko (2020:3) share three disadvantages common among TPACK self-report instruments. These are self-report instruments assessing TPACK holistically, which tend to be quite long and thus cumbersome for using the unequal distribution of items per sub-scale, leading to different measurement accuracies. For an overview and thirdly, a number of these instruments present features making them only relevant for specific populations of teachers, thus limiting the generalizability of their use, but a significant issue consists in the fact that the lack of common definitions and uncertain boundaries have resulted in producing a vast heterogeneity of self-report instruments. Moreover, TPACK failed to provide sufficient reliability and validity evidence.

### **2.3.3.3 Relevance of the theory to the study**

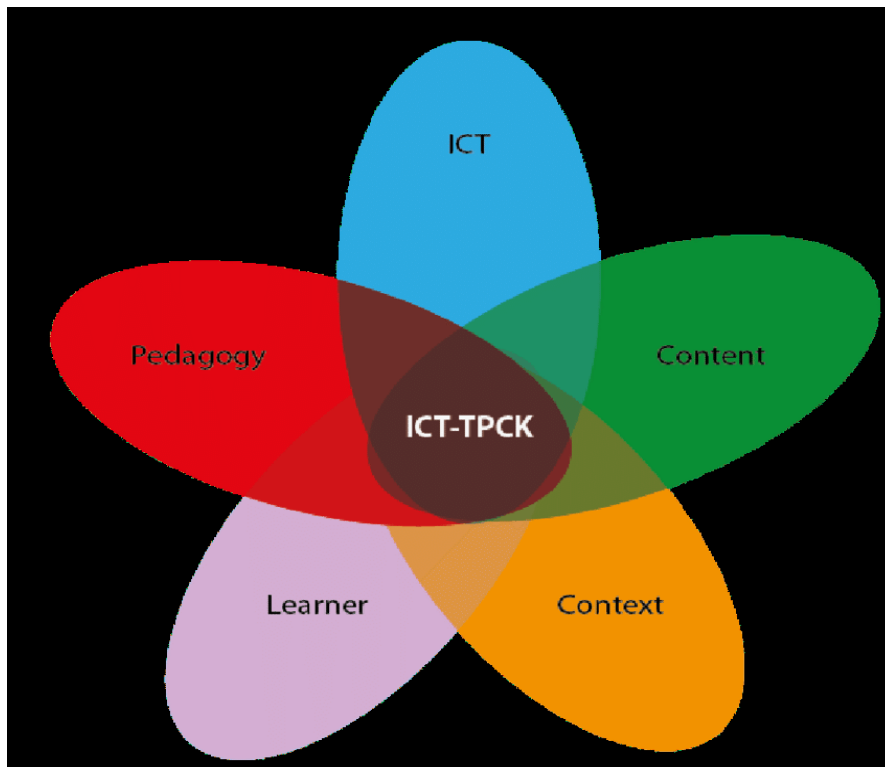
Teachers have to perfectly master the knowledge of the subject that forms part of the curriculum, but the question is, “what knowledge of ICT do they have to use the ICTs in the curriculum they master?” In other words, teachers are supposed to have ICT knowledge to satisfy the needs of learners technologically; hence, the two are intertwined, which is CK and TK. Alhababi (2017:16) argues that knowledge has been persistent to include technologies as a budding and demanding part and device in education; therefore, educators need to attain the technological and pedagogical content knowledge to have adequate quality teaching and learning. Peng and Daud (2015:569) found that teachers with more years of teaching experience were less self-assured about their TPACK for integrating web-based learning because their information is so slight as far as ICT is concerned. Educational technology knowledge and systems development knowledge contributed to the different content, pedagogy, and technology aspects that framed the system (Koh, Chai, Benjamin & Hong, 2015:460). Knowledge of teachers on the different types of the ICT tools and how they operate and are used, a theory first then practicality, was also examined in this study because all these would lead to the teachers being able to know and use the ICTs in curriculum practice and that is what is researched in this study. Tunjera and Chigona (2020:127) argue that the TPACK framework is beheld as the generally accepted

prototypical framework in describing teacher knowledge on how to teach meritoriously with ICTs.

Moreover, TPACK embraces the bond between the TPACK domains in curriculum practice. Saubern, Henderson, Heinrich and Redmond (2020:2) argue that the TPACK framework was introduced (Mishra & Koehler, 2005; 2006) as to describe “what teachers need to know in order to incorporate technology into their teaching appropriately” (Mishra *et al.*, 2006:18) and how to improve the knowledge they already have as to use it in curriculum practice. Inpeng and Nomniam (2020:370) argue that TPACK is the framework in which we have to realise the seven main types of knowledge necessary for educators for an operational ICT-progressiveness in curriculum practice. Taopan and Drajadi (2020:1, 4) argue that this framework is dynamic in defining teachers' knowledge. It contemplates what teachers need to know regarding technology integration in the classroom. It provides a theoretical lens of describing whether a teacher can effectively design and conduct technology-enhanced instruction. It defines the types of knowledge teachers consider for constructive ICT knowledge in curriculum practice. Bagheri (2020:2) argues that this framework has been documented to discourse the concerns appropriate to exploring teachers' knowledge and use of ICTs in curriculum practice to be precise. Syukri, Yulisman and Nurina (2020:2) argue that TPACK emphasizes selecting the ICT tools appropriate to the curriculum. Therefore, teachers can perfect themselves in the knowledge of ICTs and use them of the available ICT tools in their schools. The TPACK theoretical framework is primarily relevant to this study because it accommodates the choice of the ICT tools to be used; hence, the schools, particularly in this study, are the rural schools, whereby the ICT tools are enough.

## 2.4 TPACK DOMAINS

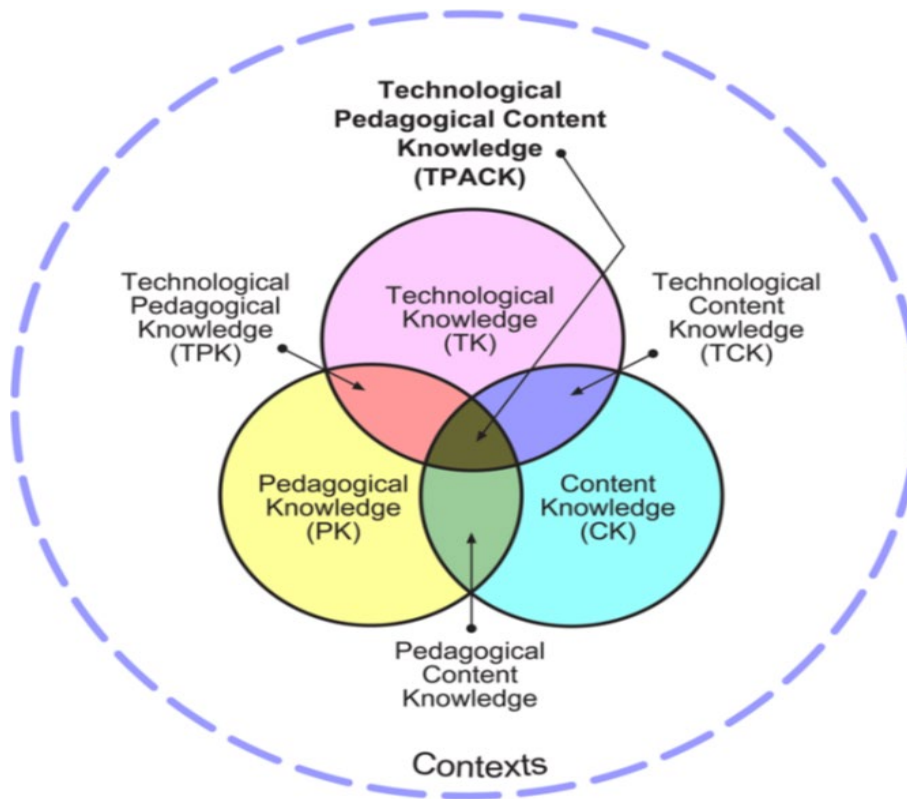
### 2.4.1 ICT TPACK



*Figure 2.1: ICT TPACK (Source: Angeli & Valanides, 2009)*

The above model of Angeli and Valanides (2009), adapted by Mailizar and Fan (2020:4), also defines knowledge of ICTs in curriculum practice.

## 2.4.2 Seven TPACK Domains



**Figure 2.2: Seven TPACK Domains**

Castéra, Marre, Yok, Sherab, Impedovo, Sarapuu, Pedregosa, Malik and Armand (2020:1) argue that the technological pedagogical and content knowledge (TPACK) model was initially hypothesised on seven clearly recognised dynamics; however, many studies have been unsuccessful to classify these seven factors empirically. Mishra *et al.* (2006:1029) argue that the TPACK framework has seven domains and these are: Pedagogical Knowledge (PK), Content Knowledge (CK), Technology Knowledge (TK), and their overlapping areas: Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK). This framework (TPACK) synopsis a multifarious connection amongst three areas of knowledge: Content knowledge, Pedagogy Knowledge, and technological knowledge. All create constructive knowledge is mandatory to use ICT in curriculum practice. For the case of the TPACK framework, meta-conceptual refers to teachers' knowledge based on the three TPACK domains and their strategies to intertwine these for planning and

implementing lessons by adding technology or by purposefully refraining from using technology in a given context (Krauskopf *et al.*, 2018:155). This study used the three domains to explore teachers' ICT knowledge in curriculum practice. Masoumi (2015:7) argues that it was anticipated that interviews would afford to bring a clear understanding of the teachers' knowledge of ICT in curriculum practice. As they will be investigated in ICT knowledge, those who still have challenges will be supported by the innovative teachers, so curriculum prestige is value-added. Alemu (2015:2) argues that all teachers and apprentices should implement ICT to buttress and augment curriculum practices because of the extra value of ICT in indoctrination. Kenan, Elzawi, Pislaru and Restoum (2015:173) argue that the suggested transformation to the rapid advancement of ICT also responds to diverse methodologies to knowledge construction, supervision, and supply techniques.

#### **2.4.2.1 Content knowledge**

Ozudogru and Ozudogru (2019:3) argue that Content Knowledge (CK) talks about the volume and connotation of knowledge in the educator's thoughts. This knowledge holds authenticities, thoughts, edifices and directions that integrate those authenticities and conceptions. It is of apprehension that teachers must have a comprehensive knowledge of the subject matter to advance and teach subjects reasonably and appropriately. Soomro *et al.* (2018:204) argue that content knowledge is the knowledge of a subject to be learned by teachers; hence, the subject teacher must have sufficient content knowledge. Michalsky and Kramarski (2015:2) argue that teachers must know the role of technology in their subject matter and detect relevant topics through technology, choose applicable computer tools, plan resources and approaches for implementing technology into lessons with an added value, and, finally, replicate on their activities and verdicts in order to monitor and appraise outcomes, progressions, and exertions. Mishra *et al.* (2006:1026) argue that clearly, teachers must know and understand the subjects they teach. Gonzalez and González-Ruiz (2016:603) argue that the TPACK framework has been freely beneficial in educational research for teachers and as an archetypal framework to organise curricula for training teachers to use ICTs in curriculum practice. Technological content knowledge is the knowledge of operative ICT tools, computer hardware and the capability to utilise

typical cliques of software. Valtonen *et al.* (2020:2828) argue that content knowledge is about the subject to be taught with knowledge of theories, concepts and practices in the field.

#### **2.4.2.2 Pedagogical knowledge**

Hilton (2016:69) defined Pedagogical Knowledge (PK) as a teacher's knowledge of current universal teaching approaches. Mishra *et al.* (2006:1021) argue that for teachers to be successful, they would have to master the subject's content before they use the ICTs, using different strategies to make it practical to the learners. Ozudogru and Ozudogru (2019) argue that Pedagogical Content Knowledge (PCK) is used to renovate former knowledge and is used to advance understanding of the subject as it encompasses pedagogical procedures. Pedagogical knowledge is deep knowledge about the processes and practices or methods of curriculum practices and how it encompasses the overall curriculum determinations, principles, and objectives. (Mishra *et al.*, 2006:1026). Setiyanti and Hunt (2017:55) argue that proficient teachers are now considered to be those who can assimilate knowledge of the theme and technology and interpret it effectively to the learners using ICT tools. Sointu, Valtonen, Cutucache, Kukkonen, Lambert and Mäkitalo-Siegl (2017:5052) argue that for teachers to provide these skills for their students, they must be familiar with various pedagogical approaches and engross different ways to support these practices, using ICT tools in a meaningful way, because of the increasing prevalence of them (ICTs) in today's society. Its meaningful use in teaching and learning has proven challenging as teachers themselves experience difficulty utilizing ICT in pedagogically meaningful ways. The findings have suggested the knowledge and use of ICT tools in curriculum practice to try to encounter the 21<sup>st</sup>-century skills; hence it is perceived by Sointu *et al.* (2016:5052) that it is evident that 21<sup>st</sup>-century skills should be a portion of teacher education. Educational technology knowledge and systems development knowledge contributed to the different content, pedagogy, and technology aspects that framed the system (Koh *et al.*, 2015:460).



### **2.4.2.3 Technological knowledge**

Alhababi (2017:26) defines Technology Knowledge (TK) as understanding how to implement and use technology in general. It is the knowledge of using the ICT tools in curriculum practice. Mishra *et al.* (2006:1018) argue that the problem is that teachers have a propensity to simply ignore the importance of technology and do not know how it is used; therefore, the introduction of technology in the educational process is a problematic issue to them, and they further argue that the demand of what teachers need to know to incorporate technology into their teaching appropriately is also of vital importance. McKenney and Voogt (2017:2) defined TK as the knowledge of hardware and software characteristics from the viewpoint of subject matter and teacher education. Therefore, it is essential for the educators' awareness foundation for teaching ICTs. Vandeyar (2020:3) argues that education is a thorny technical implementation that needs thoughtful development of "intertwining of many kinds of knowledge" with the use of technology as it (technology) presents further obstacles to the classroom context because teachers are now expected to go beyond their traditional teaching approaches and have to assimilate technology effectively. Technological knowledge is the most dynamic element framework. Karaca (2015:129) argues that teachers are expected to follow and learn about the latest technologies and apply them prolifically in the classroom in technological knowledge.

Consequently, knowledge of operating systems is of vital importance for teachers to progress with the delivery of the ICT knowledge in connection with the subject matter. Crompton (2015:86) argues that the poor knowledge of ICTs can intensify a teacher's concern for control. Hence, a teacher should be observed as the "one in control" of the class, take the lead in the curriculum delivery, and know how to manage everything in the classroom. In the case of the learners of this century who are far better in the knowledge of ICTs, how will the teacher take the lead in the curriculum delivery and the complete control of the class? That was why the researcher wanted to explore teachers' knowledge of ICTs in curriculum practice to inspire the teachers in the knowledge of ICTs. Hence they are the ones who are supposed to surpass in ICTs knowledge.

## **2.5 CAPACITY TO SUPPORT INNOVATION**

TPACK is a highly appropriate model to develop a scale that can measure and evaluate how knowledgeable teachers and pre-service teachers are about integrating technology into the instructional process (Önal & Alemdag, 2018:3). Chinapah and Odero (2016:109) argue that many developing countries and rural areas are still facing the challenge of practising software packages in the development of education at all levels due to the following factors: inadequately skilled teachers, poor infrastructure, not enough funding of programmes for sustainable development, and poor tactics for using ICTs in curriculum practice. Presently, the TPACK model is one of the most prominent models of teacher knowledge for the effective use of digital technologies in teaching (Schmid *et al.*, 2020:3). Bueno-Alastuey *et al.* (2018:3) argue that TPACK is the most comprehensively used and accepted framework to explore the knowledge base needed for teaching. It offers the connections between the three different types of knowledge.

Furthermore, the framework has been successfully applied and validated to assess and bolster teachers' ICT integration capacity and measure teachers' understanding of technology. With that note in mind, it really can support innovation. Absari, Priyanto and Muslikhin (2020:2) argue that the TPACK framework describes and targets the knowledge of technology and technological improvement of that knowledge as observed by three major components: (TK), (PK) and (CK). Inpeng and Nomnian (2020:369-370) argue that as one of the key professions, English teachers have been challenged to apply technological skills integrated with the knowledge necessary for effective teaching. Some teachers in the rural schools, particularly the senior personnel, are not clear about ICT knowledge, particularly in curriculum practice. This also applies to the new graduates fresh from the university who are also unable to implement the ICT in curriculum practice because they do not have time to use the ICT tools. The following four factors bear witness to that.

### **2.5.1 Physical resources**

Awasthi (2020:635) argues that it is impracticable to collaborate without an excellent infrastructure of IT systems, which are categorized as follows: Local Area Network (LAN), Wide Area Network (WAN) and Wireless Network, and they cannot work

correctly way without an excellent infrastructure. Fagan (2020:34-35) argues that because underprivileged schools often lack funding for basics such as electricity, toilets and desks, thus obtaining funding to set up secure classrooms to host computers, and finding tutors and teachers to teach ICT skills, is often formidable. This is frequently lacking, even though other researchers recommend that the suitable infrastructure determines the attainment of ICT projects in disadvantaged schools. Awasthi (2020:35) further elucidates that a supportable way to revamp ICT infrastructure is the only way to span the gap between the poorest schools in the lower quintiles and those who can afford the necessary IT equipment. Falade, Olafare and Aladesusi (2020:56) argue that a lack of laboratory equipment or insufficient laboratories can hamper teachers to perform simple laboratory activities that include the utilisation of ICTs, even in developing countries; hence some schools face challenges of inadequate financial resources to buy the required tools and materials. Educational support services such as libraries, elementary science laboratories, and counselling and information technology centres were virtually non-existent in a majority of the schools (Jayesimi, 2020:20). Alagu and Thanuskodi (2018:2) argue that libraries are the main birthplace of information as they provide the users with the necessary facilities from which they access the required information. Knowledge is to be effectively used by teachers in the technological augmentation of learners. Padayachee (2017:54) argues that access to ICT tools is necessary for efficacious ICT knowledge in curriculum practice. ICT should be available and accessible. Providing more availability of ICT to teachers as the most producers of information and knowledge will be essential (Allahawiah & Tarawneh, 2015:139). Access to use recorded e-resources and challenges with e-module production and using WhatsApp for educational purposes is important (Zozie, 2020:3). Zozie (2020:3) further argues that schools should incorporate technology in education, using the ever-present teaching and learning resources around them by using the Teaching and Learning Using Locally Available Resources (TALULAR) concept instead of solely relying on brand-named resources. By so doing, ICT knowledge by teachers, particularly in curriculum practice, will be successful and accessible to the poorest and most marginalised, those living in places that have no connectivity, as well as those who cannot afford the latest technologies (Unwin, Weber, Brugha & Hollow 2017:5). Yimer (2015:35) argues that the dissemination of knowledge must accompany access to an ICT infrastructure and teacher knowledge of ICT to be specific in this study. Hossain,

Salam, Shilpi and Officer (2016:53, 130) argue that a lack of ICT infrastructure also reduces teacher interest in ICT knowledge in curriculum practice. Gill (2016:433) argues that some primary schools are in very remote areas far away from electricity, whereas ICT tools need electricity, obstructing the ICT teacher's knowledge. Furthermore, challenges that institutions are likely to face when implementing technology integration include intermittent electrical power supply, lack of resources for e-learning, and resistance.

### **2.5.2 Development of the curriculum practice through the use of ICTs even during COVID-19**

Huang *et al.* (2020:21) argue that the demand for ICTs in education results in the creation of digital learning resources like Massive, Open Online Courses (MOOCs), Small Private Online Courses (SPOCs), online videos, micro-courses, e-books, simulations, models, graphics, animations, quizzes, games, and e-notes, but the selection of the digital learning resources for learners should be on the design of online learning activities and teacher knowledge. Dhawan (2020:7) defines online learning as experiences of learning using different devices (e.g., mobile phones, laptops, etc.) with internet access as it can make the teaching-learning process more student-centred, more innovative, and even advanced as it will happen anywhere as the network is available in that particular place. Besides that, with the teachers' knowledge of the above and contemporary ICT tools in education in general and in every situation, there would not be problems, even during difficult times like the COVID-19.

### **2.5.3 Knowledge of ICT in curriculum practice**

Koh *et al.* (2015:167) encourage the understanding of the seven TPACK hypotheses to be executed by teachers because they convey technology- knowledge lessons to improve 21<sup>st</sup>-century learning, which is still deficient in teachers. Jones and Tarp (2015:14) argue that today's knowledge, understanding and experience are the fundamental mechanisms that assist teachers in applying ICTs in curriculum practice. Avidov-Ungar and Magen-Nagar (2015:2-3) argue that an ICT program anticipates creating change by transforming the school into an active learning and teaching

organization, which optimally implements ICT in curriculum practice. ICT could be used as a cognitive tool, a metacognitive tool, and an epistemic tool to support critical thinking, creative and inventive thinking and authentic problem-solving, which are also common elements of 21st-century learning (Apps, 2015:52; Koh *et al.*, 2015:459). Jones and Tarp (2015) argue that the newly employed teachers are more technologically advanced in the knowledge of ICTs, as compared to the old teachers. Because they are fresh from the universities and colleges where they have done their learning activities through ICTs, there is, therefore, a possibility that they could be supporting the old team in sharing knowledge of ICTs, particularly in curriculum practice. Voogt and McKenney (2017:72) argue that TPACK, as the theoretical framework for this study, emphasised that it is essential to help teachers to implement ICT in the curriculum practice as that will help teachers to be exposed or to have access on the specific feature and use the ICT tools inappropriate ways. Voogt *et al.* (2017:70) further argue that knowledge of hardware and software is needed for teachers to understand the options from which they have to choose and to manoeuvre them efficiently for specific domains. Because mobile phones are accessible, they can be used in teaching-learning, but they must be used with explicit knowledge on how to use them in curriculum practice.

#### **2.5.4 Why is ICT knowledge so important**

Petrinšak and Pinjušić (2020:256) argue that the reasons why ICT is an important teaching and learning tool can be divided into five groups: 1) political reasons which are related to the government's wish to provide pupils with skills needed for life and work in the information society; 2) personal/professional reasons related to teachers being able to know how to use ICT in their personal and professional lives; 3) professional / pupils' needs whereby pupils need to master modern technologies that surround them, not only in school, but also at home; 4) professional / curriculum aspects, namely that a curriculum must keep pace with such changes, and preparation and revision of curriculum require the use of ICT; and 5) professional/pedagogic theory that teachers must not forget the development of pedagogical theories that are necessary to establish the best possible framework for the acquisition of knowledge and skills in the technology-dominated world. The meaningful use of ICT can

strengthen the relationship between parents and teachers (Koskela, Pihlainen, Piispa-Hakala, Vornanen & Hämäläinen 2020:4). However, that relationship will be probable and reinforced when teachers know ICT tools and how to use them. Nuraini, Qihua, Venatius, Slamet and Cholifah (108) argue that the shifting classroom, from face-to-face methods becoming learning at home, also showed the need for capacity-building of teachers; hence it has a positive value so that teachers are motivated to learn new things and perfect creativity to learn so that they will develop knowledge of the ICTs, particularly in curriculum practice.

### **2.5.5 Use of ICT tools by teachers in curriculum practice**

Ghavifekr, Kunjappan, Ramasamy and Anthony (2016:39) argue that ICT tools are collaborative technology-based tools, which have to be known and used by teachers in curriculum practice. Msila (2015:1974) argues that cell phones and televisions are among the tools transforming curriculum practice. Padayachee (2017:37-38) argues that studies show that very few teachers ideally use ICTs in curriculum practice. What may the reason for this be? Teachers today are more likely to be using technology in a flexible, quick, and on-demand fashion, cobbling together online exercises, web resources, OER materials, and possibly mobile apps (Godwin-Jones, 2016:7). Farley, Murphy, Johnson, Carter and Lane (2015:7) argue that even though it was noticeable that students were using their mobile devices for learning, there were no examples of educators enthusiastically enabling or assisting them in their learning with the mobile devices. Allahawiah and Tarawneh (2015:139) argue that the discoveries by some researchers recommend that ICTs utilisation for curriculum purposes should be given more reflection than it is presently offered. Ruggiero and Mong (2015:100) argue that professional support is needed to support those teachers. Teachers must be technologically empowered to use ICT in their teaching and learning (Ching, 2016:63). With the exception of the teachers' training from SchoolNet South Africa, some teachers empowered themselves technologically by attending ICT courses. Exploring teacher knowledge in ICT will embolden them in the knowledge and the use of the ICTs in curriculum practice.

### **2.5.6 Why do teachers have no interest in the knowledge of ICTs in curriculum practice**

Li, Worch, Zhou and Aguiton (2015:1) argue that teachers confronted with obstructions, such as a limited curriculum and lack of teaching in utilising the ICT tools, prevent technology implementation in curriculum practice. In this study, the issues mentioned above, which are the curriculum and ICT training in teachers, were investigated to establish whether the curriculum induced the use of ICT and whether the ICT training received by the Eastern Cape in Chris Hani District was enough to build the confidence in teachers in the knowledge of ICTs in curriculum practice. Li *et al.* (2015:1) mentioned two types of hurdles that might cause teachers not to be interested in ICT knowledge. These are the external barriers, which include technological access and teacher support on the knowledge and use of ICTs and internal barricades that include attitudes of the technology users, their beliefs in uncertain actions in the use of ICTs and self-efficacy is their beliefs in ICT. Jimoyiannis (2015) and Ryan and Bagley (2015) argue that external barriers also include time, and the internal barriers also include the knowledge and skills, for example, the beliefs teachers have as far as technology or ICT is concerned, confidence in the utilisation of ICT tools and teachers' willingness to change. Livingstone (2015:13) argues that teacher-connected factors openly sway teachers' ICT knowledge in curriculum practices. They include teachers' awareness and expertise, outlooks of educators in the direction of schooling using ICT, and educators' experiences. Cumaoglu (2015:217) argues that belief is one of the seven factors that best explain teachers' prognostic capability to practise ICTs in curriculum practice. Basak and Govender (2015:432) list deficiency of knowledge on how to use ICTs, absence of abilities, poor administrative support, poor quality of coaching to teachers and poorly qualified ICT managers to support teachers with the essential knowledge in the utilisation of ICTs in curriculum practice. The researcher in this study established an internal factor on the knowledge of ICT in curriculum practice. When referring to attitude, in this phenomenon, teachers are expected to adapt themselves to change because it is an essential element of attitude. Therefore De Witt, Haelermans and Rogge (2015:44) mentioned two types of teachers: 1) Those that do not want to change: those teachers do not know that they are the product of a system that is not willing to innovate at all on ICT, and 2) Those who are willing to change, but self-doubt is a challenge for them.

The researcher established the attitudes of the teachers of South Africa in the Eastern Cape Province, predominantly in the Chris Hani West District.

As for the external factors, Nyagorme, Qua-Enoo, Bervell and Arkorful (2017) argue that support plays a significant role in the online or ICT learning and teaching environment. Therefore, teachers will be investigated whether they get the motivation from the officials as far as the ICT knowledge and implementation is concerned. Padayachee (2017:54) argues that access to technology is an indispensable prerequisite towards adequate ICT knowledge and assimilation in curriculum practice. The ICT tool should be made available at all times in schools. ICT should be available and accessible. Providing more availability of ICTs to teachers as the most significant producers of information and knowledge will be essential (Allahawiah & Tarawneh, 2015:139). Accessible means low cost, simple, and designed for all, can be reached, used, and understood by any persons with or without a disability. Esfijani and Zamani (2020:12) argue that from teachers' points of view, an inadequate cultural background was another obstacle for ICT knowledge as many teachers felt more comfortable when they did tasks manually than with ICT tools since they used to do tasks as they did them before, so, they would resist the changes. Hence many research participants felt lonely while using computers; furthermore, they felt anxious when working with computers because there was no technical support in some schools.

## **2.6 LIMITATIONS OF THE THEORY TO SUPPORT INNOVATION**

The first challenge emanates from the fact that the TPACK framework is created on an existing theoretical framework that lacks theoretical clarity, finding a balance between impediment and complexity of the framework and developing precise definitions for each of the constructs in the TPACK framework (Graham, 2011:6). Gür and Karamete (2018:779) argue that in concentrating on the TPACK framework, supplementary limits are conspicuous in the varieties of documents that are accessible and the settings in which these copies are obtainable. Factors, such as the socioeconomic affordances, barriers that accompany technology use and the presence of a hierarchy of ideologies that exist in digital media and how they impact the way students and teachers can represent themselves, develop knowledge and understanding, and operate in their best interests in that environment, are not closely



examined (Hosek, 2018:19). Harris, Phillips and Koehler (2017: 5) argue that previously based on its generativist, TPACK, together with its procedures through which it is advanced, lack a sound and comprehensive understanding. This lack of coherence, along with TPACK's proliferation, has led researchers to interfere with each other and all of the components underpinning the TPACK construct, its representations, and its use (Harris *et al.*, 2017:4). Bagheri (2020:5) argues that limitations of TPACK in terms of meticulousness and its investigative manner concluded that TPACK might be effective theoretically, but provides limited practical benefits to teachers in teaching, researchers and proprietors and academic studies apprehensive towards authenticating TPACK survey devices and often report difficulty in isolating all seven components of this framework as proposed.

## **2.7 ICT POLICY REQUIREMENTS TO BE POSSESSED BY TEACHERS**

Kilfoil (2015:26) argues that globally, allowance to portable ICTs has been recognised as it is generous innovative introductions for the beginners to use ICTs to enhance the curriculum. Initially, international policy focused on technical issues, such as infrastructure and underlying standards and protocols that enable the internet to function. Byrne, Kardefelt-Winther, Livingstone and Stoilova (2016) argue that the policy must consider the vulnerability, as the indigenous or ethnic children from the rural schools and also to consider the White Paper 6 or inclusivity because the study was about teachers who are going to work with those types of students or learners. Butler, Brown and Críosta (2016) argue that the ICT policy will assist or encourage different levels of the education department, including interventions to play a lead in utilising the digital strategy to schools. They continued arguing that it is the responsibility of all department levels to ensure that the utilisation of ICTs is implanted at all phases of education. A policy on the department will support school leaders in the knowledge and the implementation of ICT in curriculum practice. All the educational parties will be expected to work cooperatively to achieve the best progress in education.

Pandey and Pandey (2020:861) argue that the National Policy on ICT (2012) skills occupies ICT use in school education to devise, catalyse, support and sustain ICT and endorses the ICT enabled activities and processes to improve access, quality and

efficiency in the school system. Apps (2015:42) argues that educators need to understand the diversity with which students experience and engage with ICT, including variations in ICT literacy, in order to cater for their diversity in educational needs and that understanding is precarious to the acceptance of the new curriculum and the design of inclusive learning experiences that permit ICT implementation for all students to materialise. For the teachers to make this possible, they must have the ICT knowledge in curriculum practice that was investigated in this study to deliver effective learning to learners with different learning styles. Generally, ICT goals in Africa are: establishing an environment that encourages networking of services and applications; promoting internet access and access to digital content; promoting education and online services; strengthening network security; building and developing an e-society and ICT human resources (Kundishora, 2014:3). The Federal Executive Council of Nigeria approved a national ICT policy in 2007 to create the National Information Technology Development Agency (NITDA) (Agabi *et al.* 2015:108). The approval of the ICT policy will assist in the enhancement of education. Because they are in charge of the curriculum delivery to learners, teachers should know ICT, particularly in curriculum practice. That knowledge was investigated in this study to awaken those teachers who have even a basis of ICT knowledge to put to use. Alemu (2015), Meyer, and Gent (2016) argue that the South African policy accentuated the knowledge and the use of ICT in curriculum practice and promised to undertake the tenacities to the challenges and backing the educational representatives in the implementation of ICTs in curriculum practice. Padayachee (2017:39) argues that the Department of Basic Education's (DBE, 2015) 'action plan', the Department of Education's well-defined four vital policies to advance ICT knowledge and assimilation in curriculum practice and the approaches include the (a) assimilation of ICT in teaching and learning to achieve significant objectives; (b) knowledge of the different types of ICT tools accessible; (c) forming partnerships with patrons of education in the improvement of e-education; (d) and also scrutinising the current situation of e-learning advantages and its impacts. Teachers of the Eastern Cape Province as a portion of South Africa will have to take the knowledge of ICTs in curriculum practice as very grim. The National Integrated ICT Policy White Paper (RSA, 2016) states that it is a means of eliminating deficiency and reducing inequality in SA schools and in an inclusive and prosperous society where enhanced education is the target to be achieved in 2030 to improve the quality of education.

## **2.8 SCHOOL ECOLOGY AND MANAGEMENT**

Gill (2016) argues that change is needed because this is the stage of development in information and technology that requires teachers to gather information and facilitate it through not merely teaching. ICT is of benefit to teachers and learners in several ways: (i) enhancing learning in classrooms; (ii) improving school management and related tasks; (iii) improving accountability, efficiency and effectiveness in school activities; (iv) introducing the usage of PowerPoint presentations and internet. ICTs in schools can lead to high-quality teaching and learning (Budhedeo, 2016:4762). Nuraini *et al.* (2020:108) argue that for the reason that teachers have switched to an online learning model overnight that revealed the necessity for capacity building of teachers, it has created a positive value so that teachers are motivated to learn new things and hone their creativity to learn the technology following current requirements since Adarkwah (2020:1) argues that internationally, technology excels in improving educational transformation and can be reliable to all educational performers.

## **2.9 SUPPORT FROM OUTSIDE AGENCIES**

The South Africa Yearbook (2015/16:142) stated that digital awareness is presented to support teachers with the knowledge of ICTs that assist teachers and learners in the knowledge of ICT in curriculum practice. Web tools like Twitter, Facebook, WhatsApp and other social media tools are examples. Exploring teachers' knowledge in ICT, particularly in curriculum practice, was this study's innovative interest. The following non-educational agencies, as mentioned by Pholotho and Mtsweni (2016), support the ICT knowledge, particularly in teachers; hence they are the drivers of education to enhance the education of the students at large. The Intel Teach Program or SchoolNet, Google in Education, Microsoft in Learning, Operation Phakisa ICT in Education Lab Vodacom, MTN, Telkom Foundation, ICT4RED Project, etc. The nature of support from those agencies differ; some provide teachers professionally by providing easy access to teachers' training programmes. Some provide schools with the ICT tools like computers for learners and teachers, overhead projectors, and routers. The Department of Education also provides teachers and school managers with laptops. Tablets were also provided to the managers of schools. Arshad (2020:27) argues that the World Bank works cooperatively with educational

organisations in many countries to back up their attempts in the knowledge and the utilisation of the reachable ICT tools as to provide teachers and learners with the opportunity of utilising ICT tools even though the schools are closed due to COVID-19 pandemic.

## **2.10 SUMMARY OF THE CHAPTER**

The chapter focused on exploring teachers' knowledge of information and communication technology in curriculum practice in rural schools. It presented literature that is relevant in answering the research questions. Definition of concepts to assist the readers of the research study were clearly elucidated in this chapter. It also discussed the theoretical framework supporting this study, which is the TPACK theoretical framework. Voogt and McKenney (2017) argue that this theory accentuates the knowledge foundation of schooling, successfully using technological equipment and curricular resources, including the ICT rich ones.

Consequently, this study concerned teachers' knowledge of information and communication technology in curriculum practice. ICT policy requirements to be possessed by teachers were explained in this chapter. School ecology and management were explained, and outside agencies' support was clarified in this chapter.

## **CHAPTER 3 :**

### **METHODOLOGY**

#### **3.1 INTRODUCTION**

The research aimed to explore teacher-knowledge of Information and Communication Technology (ICT), particularly in curriculum practice. The research question is: what knowledge of ICT in curriculum practice do teachers have? The current chapter explains and substantiates the research design and methodology used to achieve the aim of the study. In an attempt to respond to the study's main objective and to answer the research question, a qualitative approach was regarded as the apt approach for this study. It was used to engender data, journalism, social work, and education. This chapter also opened the reader's eyes and explained the methodology used to utilise and engender data to retort the study's objectives and the research design. The chapter begins with an exhaustive explanation of the research paradigm, a valuable tool to promote the research itself. After the research paradigm, a research approach followed, and the explanation of the research design to be implemented was allocated in this chapter. Population and sampling, which deals with procedures to be followed for sampling and the explanation of sites, were followed by data collection methods on which were elucidated, as well as instruments used to collect the data from the participants and the data analysis being described were covered. The study's trustworthiness was explained thoroughly and followed a discussion on ethical considerations, and the final ending is the summary of the study.

#### **3.2 THE RESEARCH PARADIGM**

Ling (2017:20) describes the research paradigm as a creation of veracity or certainty; the researcher's intent, ethics and values; the understanding of the nature of knowledge and how it may be known and obtained and the nature of the research outcomes. Amoako-Sakyi (2017:3) describes a paradigm as a configuration or comprehensive methodology taken towards a technique of exploration. Kivunja and Kuyini (2017:26) argue that a paradigm establishes the intangible theories and

philosophies that figure out how a researcher perceives the world and how she/he construes and acts within that world. It is the work of the researcher to determine the research methods to be used and how the data will be analysed. The investigation archetype may be clarified as “the set of common beliefs and agreements shared between scientists about how problems should be understood and addressed” (Brown & Duenas, 2019: 545). Kaushik and Walsh (2019:1) mention three types of paradigms and these are postpositivism, constructivism, participatory action frameworks, or pragmatism, and they are all fundamentally theoretical in nature and have the following shared elements: axiology – beliefs about the role of values and morals in research; ontology – expectations about the nature of genuineness; epistemology – expectations about how we know the world, how we gain knowledge, the connection between the knower and the known; methodology – shared understanding of best means for attaining knowledge about the world; and rhetoric – a common understanding of the verbal of research.

### **3.2.1 Post-positivism**

In their explanation of the characteristics of post-positivism, Mertens (2015), as well as Lincoln, Lynham, and Guba (2018), stated that the paradigm is systematic, objective, and generalised (Santamaria, 2020:68). Gunbayi (2020) argues that the functionalist paradigm grounded in post-positivism and technical attentiveness is very sustaining with the most assessable strand of mixed-method research. Holliday and Macdonald (2020:624) argue that post-positivism retorts to some of the first-hand understandings of the postmodern revolution by accommodating the diversity of the intercultural and the subsequent dangers of stereotyping. Djefal (2019:277) argues that post-positivism is identified by its alteration from the presumptions of positivism, yet, it remains in the philosophies of positivism, moving away from ascertainment to the argument as much as it assembles communicative and argumentative processes and also leads to a potential pluralisation of actors and lastly it is open for trans-disciplinary insights. Due to the above motives, this nature of paradigm will not be considered in this study.

### 3.2.2 Constructivism

Rahman (2017:102) argues that interpretive researchers believe individuals socially create reality, which can be transformed and understood one-sidedly. Rahi (2017:1) argues that an enthusiast of interpretive paradigms has confidence in the profound interpretation concepts, and it sightsees the interpretation of the world in which they live. Concerning the study, the researcher was trying to understand the personal experience of each teacher in the knowledge of ICT in curriculum practice. Noon (2018:82) argues that since interpretivism studies often involve the exploration of determinately personal experiences, it is possible that interviews can affect the participants' emotions, which then can leave the researcher with a range of ethical dilemmas. That is undeniably possible, and that is why the ethical certificate must be offered to the researcher before conducting the interviews. Candra and Retnawati (2020:835-836) argue that constructivism is a thought or view, a progression of obtaining knowledge through active alteration to the environment by individuals, as it is assumed that the constructivism learning theory and teaching methods can guide human learning processes. According to this approach, knowledge is based on each individual's experiences and personal interpretations (Hajhosseini, Hosseini, Shabanani, Naji & Naghsh, 2020:2). With the use of constructivism, the study's main question was addressed as the teachers acquired the ICT knowledge, which can change their teaching methods and enhance the curriculum. Constructivist theory praises student-centred learning, consisting of context, collaboration, conversation, and meaning construction (Qiu, 2019:1). According to the study, the main question was regarded as the context of which teachers, together with the researcher, had to work collaboratively through the process of the interviews where they had conversations about the issue or the context to be interviewed and valued the (make meaning) consequences of the interviews, in other words, we can make self-assessment on the bases of the ICT knowledge as accompanied by their responses on the research questions. Constructivism is typically associated with qualitative methods and literary and informal rhetoric. The researcher relies as much as possible on the participants' views and develops subjective meanings of the phenomena (Kaushik & Walsh, 2019:2). Zaripova, Salekhova, Grigoriev and Grigorieva (2018:114) argue that constructivism is a cognitive theory and a theory of knowledge development of which knowledge is the crucial component of this study. Zaripova *et al.* (2019:1114)

further argue that motivation is one of the prominent values of constructivism in terms of teaching and learning. Teachers will be motivated in the knowledge of ICTs in curriculum practice, hence through the exploration of teacher knowledge of ICTs, low knowledge teachers in ICTs will become inspired by the high knowledge teachers in ICTs, and they will try to find help from them for the knowledge of ICT tools and their use in curriculum practice. A constructivist approach is a learning approach that forms knowledge through experience to become meaningful besides the e-learning stages. Researchers use the lecture process because e-learning helps lecturers improve the quality of learning conducted through information technology in the current digital era (Anjaswari, Mulyawati & Mulyawati 2020:1366). Constructivism is a theory in learning and teaching found in psychology that explains how people acquire knowledge and learn based on their experiences, beliefs and attitudes (Sarkaneh & Al-Swelmyeen, 2020:184). Constructivism as the type of paradigm was espoused in this study because of its knowledge attractiveness and the point that its qualities are not quarantined from the qualitative approach. It can entirely respond to the focal question and the objectives of this study.

### **3.2.3 Pragmatism**

Kaushik and Walsh (2019:2) argue that pragmatism finds its philosophical foundation from the ancient assistances of the convictions of pragmatism and, as such, accepts a variety of approaches and is constructed in the proposals that researchers should employ theoretical and or methodological approaches that performs most exemplary in the exact research objective that is being examined. It is frequently allied with mixed methods or multiple methods. Morgan (2020:65) argues that pragmatists identify that two people under any circumstances cannot have the same beliefs because everyone has unique experiences and thinks differently. Instead, the critical issue is to have collaborative actions to share their beliefs, skills, and experiences. An action research design or pragmatism was selected to address a practical issue, such as *Implementing a Constructivist Teaching and Learning Method*, and the main goal in the research was to determine the effectiveness of applying constructivist teaching and learning methods on children's ability of critical thinking (Shanta & Wells, 2020:9). This paradigm does not apply to this study because it mentions mixed or multiple methods.



The study adopted a single method, which is a qualitative method. Another reason is that this paradigm addresses a practical action. The study supports conversation concerning the interviews; therefore, this paradigm will not retort the research question through practicality.

### **3.3 DEFINITIONS OF RESEARCH DESIGN AND METHODOLOGY**

Trimmer (2020:5) argues that many investigators have adopted the design approach in the part of scholastic equipment because of the probabilities offered to develop national curriculum directives, interferences, or professional development (PD), and support has been acknowledged as a suitable method for educators, even in small schools with limited exposure to ICTs proficient improvement. Comesaña-Campos and Cerqueiro-Pequeño (2020:5) argue that it is essential that the design method starts with a first phase of the knowledge recovery, with the intention of the explanation of the desires connected with the utilisation of the technological gadgets and the capabilities that result in the solution of the of complications. Alharahsheh and Pius (2020:40) argue that constructivism is the overall approach, which uses a framework's method where research progresses as it also categorizes the approaches to be used. For the sake of this thesis, a qualitative method was used in this study.

#### **3.3.1 Research design**

Castleberry and Nolen (2018:807) argue that a qualitative approach has been used in fields like education. Moreover, it is relevant to the study that includes societal relations since it is the pluralisation of the real world. Therefore, this study used the qualitative research design because Phoenix (2018:81) argues that a qualitative approach can allow researchers to learn about the voices of other individuals. The voices of the teachers from the identified schools were interviewed as a way of learning from their voices their position of ICT knowledge in curriculum practice. Mohajan (2018:2) argues that a qualitative method explores knowledge and understanding of a given topic, people's experiences, meanings and relationships, and social processes and contextual factors that marginalize a group of people (Mohajan 2018:2). Sevild, Niemiec and Bru (2020:3) argue that this approach allowed exploring the participants'

own know-hows and sensitivities in order to create a comprehensive, deep understanding of the dynamics that are relevant for commencement and preservation of educational changes toward teacher knowledge of ICTs in curriculum practice and the aim of this approach in the case of this study, was to explore teachers' knowledge of ICTs in curriculum practice. The qualitative approach was chosen since the study aimed to explore the inner experience of participants (Mohajan, 2018:2). Fusch *et al.* (2018:22) argue that the researcher is more concerned with validity in the qualitative approach. A key concept of reliability is the ability of instruments to produce a response that remains perpetual over time. Interviews were the research instruments used to collect data in this study. Through this approach, the data were valid and reliable as it helped the teachers get lifelong skills because of ICT knowledge. Watkins (2017:1) argues that qualitative methods play an active part in applied research because they deliver deeper investigations and understandings of the teacher's knowledge. Kozleski (2017:22) argues that this approach provides response curves that can bring forth adequate profound knowledge to lead the school consultants and workforce to transform their teaching approaches. The qualitative research design allowed the researcher to gain a deeper understanding of the human response, connect with the participants, and see the world from their points of view (Larson, Mathews, Torres & Lea 2017:37). Teo and Zhou (2017:518) argue that qualitative research exposed new sides about which much is already known in the case of this study. Research questions formulated as open-ended questions supported the discovery of the new information, as to advance teacher knowledge in ICTs, and the researcher in using qualitative methods to find direction, personality, trust in teammates and supervisors also applied an influence on technology acceptance and these would not have been revealed without the aid of qualitative approaches. Teo and Zhou (2017:28) further argue that qualitative techniques are apt in circumstances when we endeavour to detect the variables that may be unnoticed. According to this study, support of one another were created amongst teachers on the knowledge of ICT in curriculum practice. Karam, Brault, Van Durme, and Macq (2018:81) argue that collaboration amongst teachers and principals contributes to developing a high-quality work environment; hence support will be reinforced. Rutberg and Bouikidis (2018:211) mentioned different qualitative approaches: ethnography, phenomenology, grounded theory, historical research, and case studies.

### **3.3.1.1 Ethnography**

Neubert and Trischler (2020:3) analyse ethnography as a “bundle of practices: an ordered set of activities, people, things, and ideas as it opens up new perspectives on different demands and problems of research, and it spread out the human part in sociality and sees research practices as composed of human researchers and their non-human tools, in interaction with things, rules, and participants in the research field. Tummons, Fournier, Kits and MacLeod (2018:1914) argue that the ethnographers are interested in the customs in which the people that is the teachers and learners who actually ‘do’ the curriculum work and talk – the students and the lecturers – work with, make sense of and talk about. Hammersley, Harris, Sheikh, Davidson and Walker (2017:4) argue that through an ethnographic approach, the researcher could study the participants’ social activities in their naturally ensuing setting or fields with the researcher, as she or he collected data without a violent act towards the participants. Therefore the researcher will be in the participants’ site during acquiring the multitude of data a. Górska (2020:50) argues that extending fieldwork online might be the safest way to start learning about digital ethnography in the pandemic times; hence it can help us investigate further into comprehensive structures and locations of power, educational practices and social sensations when the only option we have is ‘anthropology from home’. Due to different reasons, teacher knowledge of ICTs in curriculum practice will make things easier for teachers to continue teaching and learning even if schools are closed. The influence of a recording device may remain in situations where the recorder is turned off; the very existence of the device, and the intention of the interviewer to record, even if the recorder is put out of sight, can mean that it still has a presence in and an influence on the interaction (Rutakumwa, Mugisha & Bernays 2020:566). Voice recording was done in this study during the collection of data. Abidin and de Seta (2020:4) argue that the comparisons of the four acknowledgements by digital ethnographers working on participant interpretations of socio-economic and socio-culturally reserved aspects of interacted communication requests students into the protected froths of theoretical off the record and offers a cherished description of the predicaments and complications of using the qualitative research approaches to digital technologies.

### **3.3.1.2 Phenomenology**

Churchill (2018:222) describes phenomenology as accepting a “first-person” point of view: continuing imaginatively in someone else’s shoes and seeing the world as they see it. In other words, the researcher had to place herself in those teachers' positions who had little or no knowledge of ICTs in curriculum practice; how is it to have no knowledge or little knowledge in something that can furnish you to master your work. Noon (2018:2) describes phenomenology as an allusion to studying human experience and how things are observed as they appear to perception. In the case of this study, what ICT knowledge do teachers have in curriculum practice? Moreover, that was what was to be investigated in this study. Timonen, Foley and Conlon (2018:3) assert that with a grounded theory, mainly classical, only a theory comes out from information and is drawn out by the researcher as she or he is unscrambling the data in the researcher’s role as an isolated. However, programmed technical viewer, CGT, fully involves the researcher in producing data and theory (Levinsson, Norlund & Beach, 2020:11). The phenomenology approach empowered them to come close to experiencing their respective teacher education settings. It also helped them move beyond their individual experiences and accomplish a joint first-person account. This approach is relevant and appropriate to the study. Through the interviews to be used, teachers with little or no knowledge in ICTs in curriculum practice will be exposed since the first person or an individual is the one who experiences no knowledge or little knowledge in ICTs.

### **3.3.2 Historical research**

Gill *et al.* (2018:3) argue that scholars suggest historical interpretations provide new perceptions that could fill essential theories with a greater sensitivity to the issues raised by the humanities, a more prosperous understanding of organizations and a new point of view in accepted assumptions. In this study, the researcher furthermore considered the attitude of the old age teachers on ICT knowledge in curriculum practice and, therefore, will try to change their convictions through conversations.

### **3.3.3 Interpretivist paradigm**

Radic, Law, Lack, Kang, Ariza-Montes, Arjona-Fuentes and Han (2020:5) argue that in the interpretivist paradigm, communications and interpersonal relationships between people are filled with various interpretations and individual responses and, as such, interpretivist-qualitative lenses over a profound understanding of the link between implication and action. Thus, interpretivism is often accompanied by unstructured interviews and the collection of oral data and is related to a qualitative approach, hence an interpretivist paradigm is a bottom-up approach and, as an insider, a researcher must be an empathetic observer, a faithful reporter, and a mediator of language who observes the social world from the subject's perspective. Thus, the reliability of the interpretivist paradigm is in an interpreted reality where the researcher identifies and addresses the conclusions of an individual's reality. McChesney and Aldridge (2019:7) argue that the knowledge impending from the interpretivist paradigm is essentially connected to the research members and the setting of the exploration; therefore, the consequences of interpretivist exploration are not a globally appropriate hypothesis or conjectures but, relatively, affluent and context-specific located contemplations. The data to be collected from the participants were interpreted as the identified participants should give it; hence they are the ones who are linked to the contexts of the research.

### **3.4 PARTICIPANTS**

Esfijani and Zamani (2020:5) argue that the study participants included teachers who were selected purposively, and the selection was proportional to the number of teachers in each educational district. Gómez-Trigueros and Ruiz-Bañuls (2019:2) argue that an indication is that although the participants possessed a high level of 'content knowledge', the same is not true when it comes to their 'technological knowledge'. (Beneteau, 2020:754) More work in HCI (human-computer interaction) includes teachers or talented learners being technologically interconnected to improve oral communications. This is the situation with teachers because verbal communication is the central part of their job; hence they can communicate well with whomever they deal with. Bennett, Kajamaa and Johnston (2020:490) argue that when recruiting participants, the number of the participants must allow some escalation of

numbers; hence situations change. According to the study, all the identified participants or teachers were established or permanent in their school; therefore, they did not pretend to have interests in the study because they were very interested in the knowledge of ICTs, particularly in curriculum practice. This approach allowed exploring the participants' own experiences and perceptions (Sevild, Niemiec, Bru, Dyrstad & Husebø 2020:3). Because the teachers, as the participants of this study, were the ones that were experiencing the situation in the workplace, they also knew their perception of ICT knowledge. Pallesen, Rogers, Anjara, De Brún, and McAuliff (2020:364) argue that creating participative security and a happy team climate is imperative in encouraging participants to share stories and experiences, henceforth this uniquely the responsibility of the researcher to provide this.

### 3.4.1 Characteristics of participants

As the chief person in the dissertation, the researcher conducted the interviews with the assistance of the two participants from each school, who gave the researcher the indispensable information required in the study. The information was given in the form of answers to the questions asked by the researcher. A principal and one teacher were identified from the four schools to epitomise other teachers in providing the necessary information to the researcher. The information provided was about their knowledge as teachers in ICTs in curriculum practice. They identified teachers were characterised as follows:

**Table 3.1: Characteristics of School A**

| <b>Characteristics</b>          | <b>Principal</b>   | <b>Teacher</b> |
|---------------------------------|--|----------------|
| Gender                          | Female   | Female         |
| Age                             | 59   | 51             |
| Professional qualification      | PTD, ACE, MATHS LIT CERTIFICATE, BA, BEd Hons in Management. | SPTD           |
| Grades taught                   | 4 & 5  | 2              |
| Professional development in ICT | YES  | YES            |

|  |   |          |
|--|---|----------|
| Years of experience as a Principal / Teacher | 26 years of teaching experience and 10 Years as a principal | 23 years |
| Experience in ICT                            | NO  | NO       |

**Table 3.2: Characteristics of School B**

| <b>Characteristics</b>                | <b>Principal</b> | <b>Teacher</b> |
|---------------------------------------|------------------|----------------|
| Gender                                | Female           | Female         |
| Age                                   | 48               | 50             |
| Professional qualification            | JPTD & HED       | JPTD & ACE     |
| Grades taught                         | 6 & 7            | 1 & 2          |
| Professional development in ICT       | NO               | NO             |
| Years of experience as a HOD/ Teacher | 26               | 11             |
| Experience in ICT                     | NO               | NO             |

**Table 3.3: Characteristics of School C**

| <b>Characteristics</b>                | <b>Principal</b> | <b>Teacher</b> |
|---------------------------------------|------------------|----------------|
| Gender                                | Male             | Female         |
| Age                                   | 52               | 48             |
| Professional qualification            | SPTD & FDE       | STD            |
| Grades taught                         | 6 & 7            | 4, 5, 6 & 7    |
| Professional development in ICT       | NO               | NO             |
| Years of experience as a HOD/ Teacher | 26               | 11             |
| Experience in ICT                     | NO               | NO             |

**Table 3.4: Characteristics of School D**

| <b>Characteristics</b>                | <b>Principal</b> | <b>Teacher</b> |
|---------------------------------------|------------------|----------------|
| Gender                                | Male             | Female         |
| Age                                   | 51               | 43             |
| Professional qualification            | SPTD             | NPDE & ACE     |
| Grades taught                         | 4,5,6 & 7        | 1 & 2          |
| Professional development in ICT       | NO               | NO             |
| Years of experience as a HOD/ Teacher | 18               | 11             |
| Experience in ICT                     | YES              | YES            |

### **3.5 NATURAL SCENERY**

Persky (2020:334) argues that qualitative research encompasses the study of a group's experiences in ordinary settings, investigative into meaning, know-hows, and participants' sentiments. In this study, data was collected from the participants in their workplace in the rural schools where they encountered the curriculum challenges.

### **3.6 POPULATION AND SAMPLING**

Rahi (2017:3) defined population as it can be all populaces that one identifies, whereas sampling is the procedure of choosing a subdivision of the populace for exploration. As it was said in the above paragraph, the study took place in the Eastern Cape in the rural schools of the Chris Hani District. This District comprises a poor population, which negatively affects teachers' knowledge of ICTs. There were no ICT tools in some schools, which habitually affected the schools of that locality. From those types of schools, the researcher had to identify the participants who could give the required information that was accurate to the study. Rahi (2017) argues that the nature of the study influenced the choice of sampling. According to this study, purposive or non-probability sampling was chosen for the study. This sampling was because participants were those that the researcher had comparatively easy access to. Tan, Chew and Hamid (2017:8) argue that purposive sampling (judgmental sampling) is a non-probability sampling procedure where the verdict of the researcher is used to



select the suitable research participants that will best answer the research problems as to accomplish the research objectives. Rahi (2017:3) and Kamweru, Kiliku and Kiai (2018:174) define judgmental sampling as a non-probability procedure where the researcher uses his / her judgment to select the population members will be those that will give the desired information relevant to the study of focus. Rahi (2017:3) further argue that this technique is expedient and cost-effective; therefore, it will be convenient for the researcher to use this type of sampling because the participants live far away from the researcher. In the case of this study, this type of technique was used because the participants' sites are far away from the research site; therefore, it was effortless to reach their sites without too many costs from the researcher.

### **3.6.1 Site-selection**

Munyengabe, Yiyi, Haiyan and Hitimana (2017:2) argue that factors prevent the knowledge of technology in curriculum practice, particularly in rural schools. They include: a shortage of knowledgeable teachers in ICT, lack of time for ICT implementation, lack of ICT tools, the distribution of computers in schools was insufficient, and the schools' geographical location was also a problem since some schools had no electricity, and lastly some schools had no internet, due to poor infrastructure in the rural areas, because of the challenges facing the rural schools, the researcher used those schools to explore from the teachers what ICT knowledge they had in curriculum practice because some of the schools did have the equipment or the ICT tools. This study was conducted in the rural schools of the Chris Hani District of the Eastern Cape Province in South Africa. Four primary schools were selected, and they were labelled as School A, B, C and D. The selection of this district does not mean that the others are less important, more than the fact that they were the poor schools and were classified under quintals three. Teachers and principals of those schools were interviewed on their ICT knowledge, predominantly in curriculum practice. In the case of this study, the researcher was a teacher from this district and teachers from the same district generally know each other; therefore, access to these schools was very tranquil. Teachers from these four schools, together with the principals, were interviewed. The number of the panel size was eight.

### **3.6.2 Description of research site**

Chris Hani District Primary Schools, in the rural areas of the Chris Hani District, is the place where the interviews will be conducted. Teachers are very few, with one principal with no deputy, due to the number of learners, which are very small and that results in too many teachers being placed in other areas of the province, far away from their homes. In all the schools there are no libraries nor computer labs. The teachers themselves kept laptops given by the Eastern Cape Department of Education. Those schools received sponsors of ICT tools like laptops from different companies like Mercedes Benz, and they were kept in the trolley, as shown below.



**Figure 3.1: Laptops kept in the trolley**

#### **3.6.2.1 Cimezile Primary School**

The school is in the rural area of the Chris Hani District near Queenstown. The school consists of five teachers, including the Grade 'R' practitioner. It has about seven working classes. All teachers in that school have laptops, including the school principal. In addition to the laptops, the principal has a tablet sponsored by the Eastern

Cape Department of Education. The principal uses the tablet to receive the emails sent by the District Director of Chris Hani District and emails from the province. A small white tablet belongs to the School Nutrition Programme coordinator, which she uses to capture learners' food portions, the number of teachers present on that day, and learners. All the ICT gadgets belonging to the teacher are in their proprietorship. This school does not form part of those schools sponsored with the laptops for learners.

### **3.6.2.2 *Vuselela Primary School***

The school is also in the rural areas of Chris Hani District near Queenstown. The condition of the ICT gadgets is the same as the school above. There is no library or computer lab. There are no laptops for learners, only the one for the school clerk, which is used for administration staff. Their gadgets are in their proprietorship as well.

### **3.6.2.3 *Poplar Grove***

The school is also in the rural areas. There are five teachers, including the grade 'R' practitioner. The situation of the ICT gadgets is the same as with the school above. They also keep their laptops with themselves. There is no computer lab or library. Learners have laptops that are kept at school in the trolley. The school is at risk because theft has happened several times before in that school, and as a result, those school laptops are no longer the number delivered to the school by the sponsors.

### **3.6.2.4 *New Hope Primary***

The school is also in the rural areas. The school has eight teachers, including the two grade 'R' practitioners. The researcher is the educator of this school. The circumstance of ICT gadgets is similar with the schools above, except that in this school there are also laptops that belong to the learners, which are about 25, including the one for the school IT coach, who is the researcher. Teachers' laptops are in their belongings. Those for learners were sponsored to that school during the 'Rally to Read Programme', which encouraged companies like 'Mercedes and School Net'. School laptops are also kept in the trolley, and they are still the same number delivered,

although break-ins happened several times, but without anything being stolen. There is another laptop that came from ITEC through SADTU. There are about three photocopier machines, which are all in good condition and are used by the school clerk, the community and the teachers. There is one laminating machine bought by the school and is used by the clerk. There is no computer lab, but there is a class used as a computer lab by the ex-principal; hence, the school tried to use the ICT gadgets to train the community youth in the olden days, but due to redeployment, this has reduced. Those computers are not all in good condition, and they were given to a nearby crèche for small children to play with.

### **3.7 DATA COLLECTION**

#### **3.7.1 Role of the researcher**

Mceleli (2019:176) argues that the researcher is the nucleus in the research procedure, yet, the role of the researcher is informed by the theoretical framework chosen to be used when conducting research and the philosophical anticipations or world views support investigators in selecting the complications of the data collection process, drawing up the questions to be asked and the concepts to be utilized in their construction of adequate knowledge. The researcher's role as an emancipatory researcher was to bring together a team of people with different life experiences and abilities who could solve the problems they face (Lefete, 2018:80). Just like in the case of a film, all the events are close to the researcher. The researcher could be described as both "insider" and "outsider" in this study because she was a lecturer in one of the three academic year level groups that participated in this study (Bertelsen, Bødker, Eriksson, Hoggan & Vermeulen, 2018:52). In the case of this study, the researcher was the insider; hence one of the schools interviewed was the school where the researcher is working, and in others, the researcher could be regarded as the outsider. Bruskin (2019:160) argues that "insider" is a label used to signify researchers who are doing research in an organization, they are either part of and have an "easy way", and they are also an "active participant" of that particular organisation or are supported for example, as an employee of that organisation. Wang, Zhang, Zhu, Ji, Liu and Hei (2018:507) argue that creating trust and mounting connexions with respondents is very decisive because a connexion in the research can suggestively foster the research

source of sustenance. Avella (2016) argues that the researcher's primary task is the designer/manager/tape recorder and the back-and-forth communiqué between researcher and panel members.

Consequently, the researcher designed the types of questions to be asked, and a tape recording was done during the panel discussions. Even though numerous participants knew the researcher from those schools, the researcher detected a neutral stance during the course of the project. The findings will help the teachers of those schools to see where they are in the knowledge of ICTs, particularly in curriculum practice.

### **3.7.2 Data collection process**

Interviews were conducted in four schools in Chris Hani District in the Eastern Cape. The schools' name was New Hope Combined Primary School, where the researcher is working. The nearest schools were Poplar Grove Primary School, Vuselela Primary School, and Cimezile Primary School. Permission to conduct the interviews in those schools was requested in the form of written letters to the principals of those schools. The researcher visited the schools on different dates, and she visited two schools per day. The researcher briefed the school principals and the teachers about the purpose of the interview, and the appointment to meet them again on the second gathering was made on the day of the briefing. On the second gathering, the researcher met the participants again to conduct the interviews hoping that they were fully prepared as they were briefed on the first meeting. Again the researcher briefed the participants and told them that the research was voluntary and not to participate (Roth & Unger, 2018:8). Connor, Copland and Owen (2017:4) defined confidentiality as it denotes that investigators recognise the identity of the members but devote themselves to not revealing names of the individuals' involvement and identity. Connor *et al.* (2017:4) argue that active steps were taken to assure confidentiality of the participants' identity during the interview process. Anonymity and confidentiality of the participants' identities were also ensured during the conduction of the interviews. Questions to be asked: See appendix B below.

### **3.7.2.1.1 Conducting of the interviews**

Mannion, Blenkinsopp, Powell, McHale, Millar, Snowden and Davies (2018:67) argue that the interviews were semi-structured and were based on an interview guide drawn up after the early literature interpretation. The researcher started the interviews with a brief description of the study and discussed ethical issues. Before the commencement of the interview, a good rapport was first established with the participants to facilitate a good mood. Semi-structured, in-depth interviews were used, and each interview lasted for 25 to 30 minutes. At the onset of the discussion, the meeting began with going over and reading the consent form with the participants and asking if they had any questions about the consent forms. However, no questions were indicated, and the participants were informed that the final transcriptions would be completely anonymous. The participants were reminded that before the interview began, if at any time during or after their conversation anyone wished to end the discussion or have all association with this process erased, they should feel free to make such a request and lastly the ). Voice recording was done during the interview activity. It was emphasised to the participants that the recorded information would not be posted on social media, and it was ensured that it would be kept between the interviewer and the supervisor. The researcher interviewed two teachers, including the principals from four different schools, and the entire number of the interviewed teachers were eight. Before the start of the interviews, the participants were informed first about the objective of the interviews. The researcher also asked questions as indicated in the interview guide and clarified vague questions continuously. The researcher encouraged clarification of the vague responses from the participants, as they had (participants) felt tranquil during the interviews and encouraged them to express themselves with self-confidence. Questions asked were similar for the managers and the teachers. The researcher asked the participants questions based on the knowledge and the use of ICTs in curriculum practice, starting from the number one question up to the end and paying as much attention to what respondents were saying and what they were not saying. The participants did voice recordings during the interviews.

The data were presented in the following ways: to break the ice or prepare the participants on the question, which is about the knowledge of the abbreviation, 'ICT', which was considered as the contextual information. Then lastly, a summary that

vindicates all the phases engaged in exploring teacher knowledge in ICT in curriculum practice was discussed to give the findings directed by the literature.

### **3.7.3 Data collection instrument**

#### **3.7.3.1 Interviews**

Interviews are defined as a conversation between two people (researcher and participant), discussing a topic of mutual interest of which the respondent is regarded as an expert (Kalisa & Picard, 2017:5). Interviews were used as a tool to collect data in this study. A data collection process took place using individual semi-structured interviews (Jonker, März & Voogt, 2020:73). DeJonckheere and Vaughn (2019:2) argue that semi-structured interviews can be performed in various techniques: face-to-face or online with individual strengths and shortcomings. Santo-Tomás Muro, Sáenz de Tejada Granados, and Rodríguez Romero (2020:4) argue that semi-structured interviews (SSIs) are created on a given script that organizes the interview, mutual with some open-ended questions, where the interviewee is allowed to elaborate on his or her answers. Due to the above facts, the elaboration of responses by the interviewee and the elaboration of the questions by the interviewer are the strategies used in the individual semi-structured interviews. Therefore this type of interview was used in this study. Larki, Bahri, Moghri and Latifnejad Roudsari (2019:105) argue that semi-structured interviews use open-ended general, specific, and probing questions. During the interviews processes, the researcher noted clear non-verbal cues, such as body language and facial expressions and all the interviews were voice recorded and transcribed. Semi-structured interviews, as one of the types of interviews, were adopted in this study because of the processes mentioned above of conducting the interviews. According to this study, the semi-structured interviews took approximately 30 minutes per participant.

Hawkins (2018:493), and Gill and Baillie (2018:669) argue that researchers have predominantly conducted face-to-face interviews, and this study was based on the qualitative research method, which therefore often utilises one-to-one, face-to-face interviews with research participants with their presumptions about the world around them as to identify new ways to understand phenomena. During the process of interviews, the researcher visited the places where the participants worked to collect

data. It is of vital importance as this approach guarantees the researcher's surety in creating individual acquaintances based on mutual trust, respect, and consent; a sensitivity to power relations and the co-construction of knowledge; and the recognition of the researchers carrying out research with their participants, not on them, as well as with the participants' experiences being shared with the researcher. Litosseliti (2018:158) argues that the investigators must work out a series of questions, confirming that both the order and the phrasing of questions used are identical with each interviewee and the questions asked are restricted in terms of how an interviewee can respond – either by using 'yes/no' formats, multiple-choice questions or rating scales of one kind or another. In this study, the researcher asked the participants the same questions individually from all the school teachers of the schools visited; hence the researcher was in full charge of the interview process. Karunaratne, Peiris and Hansson (2018:125) argue that the interview duration is sometimes not controlled. The participants can give long and expressive answers; hence, it depends on the type of questions asked, and an interview guide was used. Lott (2018:48) argues that an interview guide was employed for all interviews, and it was structured to address both of the qualitative research questions. As the assisting tool in this process, the interview guide shields the main topics of the interviews, and it offers an attentive structure for the discussion during the interviews but should not be strictly followed. Instead, the idea is to explore the research area by accumulating related information from each participant. The talkative and situational approaches were used to make things easier for the researcher. The wording of questions was changed where necessary during the interviews to feel free. The questions were used to find out from the teachers of this district about the knowledge of ICTs, especially in curriculum practice.

Questions asked to the principals and teachers were as follows:

1. What is your understanding of Information and Communication Technology (ICT)?
2. Do you know how to use ICT tools for curriculum practice?
3. Which subjects do you use ICT in most of the time?
4. In the school, do you have access to the ICT tools?
5. Which ICT tools do you have in the school?
6. Do you know how to use them, especially for curriculum practice?



7. Are you interested in using the ICT tools, particularly for curriculum practice? If yes/no, why do you have or not be interested in using them?
8. What knowledge do you have in relation to the use of ICT generally?
9. What knowledge do you have concerning the use of ICT in curriculum practice?
10. What challenges do you experience when you are using ICT, especially in curriculum practice?
11. What do you expect to know about ICT use, especially in curriculum practice?

### **3.8 DATA ANALYSIS**

Lester *et al.* (2020:96) argue that data collected using different materials and analysed through qualitative data analyses brings significance to data. Semi-structured interviews were analysed competently. Dadzie, Runeson, Ding and Bondinuba (2018:6) argue that qualitative data analysis basically encompasses separating data into components, understanding the components, and relating to each other. Watkins (2017:2) argues that an essential step of any qualitative project is analysing the data in both in-depth and practical mode. Onwuegbuzie and Weinbaum (2017:362) argue that qualitative analysis begins with the construction of a truth table, which lists all unique configurations of the study, including participants, and situational variables that have been identified in the data, along with the corresponding type(s) of incidents, events, or the resembles that have been observed for each character. They further argue that due to the comparison being made on the participants' responses, the investigator estimates the degree to which types of events, experiences, perceptions, or the like are unique or similar, and the surplus of this information is identified and removed. The research questions are copied from an overview of the literature, accordingly used as a basis for interviewing. The research questions developed from the literature review were used in the personal interviews. Fusch *et al.* (2018:20) define Denzin's triangulation as one technique in which the researcher analyses data and then presents the results to other researchers to understand the experience of the common phenomenon. Abdalla *et al.* (2018:1) define triangulation as the meaning of the three concepts: reliability, validity, and generalization. In this study, trustworthiness was confirmed through the strategy of triangulation. Data related to the knowledge of ICTs in curriculum practice were analysed and presented in an attempt to respond to

questions three and four, see appendix B. Data in relation to the interest of ICT knowledge was analysed to respond to question one.

Moreover, the data in relation to the policy requirements of ICT were analysed as an attempt to answer question four. Onwuegbuzie and Weinbaum (2017:362) argue that qualitative analysis begins with constructing a truth, which lists all unique configurations of the study that have been identified in the data, along with the corresponding type(s) of incidents events, that have been observed from each character. They further argue that due to the comparison being made in the participant's responses, the researcher estimates the degree to which types of events, experiences, and perceptions are unique or similar. The unnecessary variables from these configurations are identified and removed.

### **3.8.1 Trustworthiness**

Grosser *et al.* (2019:4) argue that trust is defined psychologically as the enthusiasm of the (thruster), in this case, the interviewer, to be susceptible to the actions of (the trustee) that is the participants. This enthusiasm is prejudiced by the researcher's inclination to take a threat of trusting on the one hand by the perceived trustworthiness of the trustee on the other. Halfmann, Dech, Riemann, Schlenker and Wessler (2018:10) argue that the term 'trustworthiness' consequently refers to trust in the selectivity of confirmations and the accuracy of understandings. The issue at hand was to ensure the trustworthiness of the study's findings to establish the coherence between the methods used and the initial analysis that was planned (Naido, Pillay & Samuel 2018:81). In order to achieve trustworthiness in this study, the information gathered should not have favoured the researcher's interest. Hence, the information gathered would be kept on its original design depriving the accumulation of what the participants conferred. Rose and Johnson (2020:9-10) argue that according to the member check strategy, all transcripts of the interviews and focus group discussions were sent to the participants for comment to ensure the trustworthiness of the information gathered. An opportunity was given to the participants to correct their interpretations. In the event of the voice recorded interviews, the participants were allowed to heed what each participant said from the voice note. Gill *et al.* (2018:9) and Nyirenda *et al.* (2020:2) argue that in qualitative research, trustworthiness is defined

as a conception that encompasses numerous measurements, like credibility, dependability, confirmability and transferability.

### **3.8.2 Credibility**

Grosser *et al.* (2019:6) argue that credibility refers to the correctness of information offered by reliable sources with verified information. Kuemmel, Yang, Zhang, Florian, Zhu, Tegenge, Huang, Wang, Morrison and Zineh (2020:21) argue that credibility talks about reliance in the predictive competency of a plan distinctive for a precise setting of practice. Tracy (2019:255) defines credibility as dependability, trustworthiness and venting a probable reality or giving the impression of the facts. Readers feel assured using its data, findings, and decisions if the report is credible. Mazur and Duchlinski (2020:56) mention the following principles of credibility as relating to Machiavelli's advice to credibility in the public area: 1) one should avoid such kind of (moral) credibility that makes it impossible to fulfil one's objective; 2) one should avoid being not credible only if it makes it impossible to achieve one's objective; 3) not keeping one's word may always be legally justified; 4) even what is the most unreliable is credible to someone; 5) it is not necessary to be credible, but it is necessary to appear credible. Even though the participants well knew the researcher, the researcher tried by all means not to be judgemental towards the participants' status in as far as the knowledge of ICTs in curriculum practice and the assurance of whether the credibility of the information they gave solely depended on them. Wölker and Powell (2018:8) argue that credibility is judged by five bipolar items: (1) unbelievable or believable, (2) inaccurate or accurate, (3) not trustworthy or trustworthy, (4) biased or not biased, and (5) incomplete or complete. Makinde (2018:36) introduces four types of credibility: presumed, reputed, surface, and experienced.

#### **3.8.2.1 Presumed credibility**

Makinde (2018) explains this credibility by portraying how people take in information produced by an individual. Sheriff (1018:18) explains this credibility as general expectations apprehended by a reader. As the researcher of this study, some of the teachers interviewed were the ex-colleagues of the researcher; therefore, they knew

her, and on that note, credibility was a particular case, and her expectations concerning the information given by the participants had too many challenges in the knowledge and the use of ICTs in curriculum practice. Some teachers did not use their laptops for teaching and learning, which was indicated in the study's objectives in chapter one. Marino, Bilge, Gutsche and Holt (2020:5) define credibility as allegiance or authenticity of the information source whereby when one presents the information, perceptions of the source, and its believability, helps determine whether one evaluates this information satisfactorily. After that, stereotyping occurs and has a significant impact on perceived source credibility, and that is the reason why credibility be defined as the evaluation of information, and the foundation of that data, in a complimentary manner, with a propensity to trust the participant and then one can evaluate prejudiced anticipations about an individual's credibility because of their settings. For the sake of this study, the information given by the participants was perceived as per their geographical setting because they are from one of the poorest provinces of South Africa that is Eastern Cape. Therefore lack of knowledge about ICTs in curriculum practice is highly expected from the participants.

### **3.8.2.2 *Reputed credibility***

Liang and Ploderer (2020:4) explain this credibility as a link from hearsay, either from the person or the media. The participants' responses during the interviews were compared with the problem statement stated in chapter one of the study. According to their responses (teachers), did they genuinely have a problem with the knowledge of ICTs in curriculum practice? Chapter one of the study assisted in the credibility of the research. Shariff (2020:2) argues that reputed credibility requires reasoning/authorisation, such as contacts with other reputed networks and other components. Educational policies even in the Eastern Cape Province have recognised the importance of teacher knowledge of ICTs in curriculum practice, and more significantly in the present scenario where the countries all over the world are faced with the chaotic situation of the COVID-19, which encourages all teachers to have ICT knowledge in order to proceed with education even outdoors or online.

### **3.8.2.3 Surface credibility**

This credibility is obtained by the network entities, which “directly” interact with one another (Mazur & Duchlinski, 2020:59). Shariff (2018:180) is explained as the connection between the design and the functionality of a platform, e.g. online social media, website and many more. Whether teachers can use the ICT gadgets for network entities would depend on their responses, telling whether teachers really know how to use ICTs.

### **3.8.2.4 Experienced or earned credibility**

Shariff (2018:18) defines earned credibility as the knowledge a reader has with a specific area. Liang and Ploderer (2020:17) argue that experienced or earned credibility is centred on trying out the technology. As indicated in chapter one of the research study, specifically on the research questions, it is of vital importance for the teachers to be interested in the knowledge and the use of ICTs in curriculum practice. Therefore credibility was ensured by their responses to the subsidiary questions. For example, they responded on using ICT tools in teaching and learning; hence, they have a rudimentary knowledge of using gadgets for personal issues. Zilu *et al.* (2020:4) argue that previous intellectuals elucidate credibility as plausibility, and they delineated four categories of credibility: supposed credibility, apparent credibility, superficial credibility, and expert credibility. Zilu *et al.* (2020:4) further explained that supposed credibility chats to an individual’s anticipations and typecasts, apparent credibility chats to what an individual has overheard from the third receptions like friends or ads and superficial credibility chats to the main impersonations constructed on guileless periodicals. In contrast, expert credibility is constructed on undertaking the ICTs.

### **3.8.3 Transferability**

Nolen (2020:37) argues that transferability is a term that enquires how the knowledge applied in a solitary domain might transfer to another domain. In other words, cognitively transferability might be demarcated as how knowledge acquired in a solitary situation applies or fails to apply in other situations. Wilkinson (2020:44)

defines transferability, or external validity, as it occurs when research outcomes can be protracted outside the limitations of a research study to be simulated in further studies or different settings. As stated on the selection of sites in chapter one of the study, namely that purposive sampling will be used in the study, participants were teachers of the Chris Hani District Municipality in the Eastern Cape in South Africa. The latter were purposefully selected because the information they could provide could not be acquired from other people. Site selection was also detailed in chapter one, and the data selection method assisted in the trustworthiness.

#### **3.8.4 Dependability**

Cambridge, Fereja, Mai, Yuan and Bellefeuille (2020:25) argue that dependability as parallel to reliability refers to the evenness of observing (discerning) the same discovery under similar situations. Nyirenda *et al.* (2020:2) argue that constancy (dependability) is the extent to which a thesis can be simulated, and even if there are many viewers (more than one), supporters of the investigation group comment on what they perceive and overhear. Cambridge *et al.* (2020:25) argue that dependability evidence consists of detailed voice recordings and data analysis processes. During the process of data collection, voice recording was done by the researcher, which assisted in the trustworthiness. As stated above, the research design would also be evidence of trustworthiness. Yinger (2020:76) argues that the rationale for why a qualitative design and exactly how the data will be collected were discussed hitherto, based on the research questions and supports research in the literature review.

#### **3.8.5 Confirmability**

Sambo and Spies (2020:79) define conformability as the point to which others could confirm the findings. Kernis (2020:87) defines confirmability as a theory that designates the quality of a study's verdicts as the result of research rather than the researcher's partiality and bias. Confirmability checks for researcher bias by performing member checking throughout the research process to receive participant feedback (Lyon & Slaney, 2020:110). Therefore the findings of the study must be able to be confirmed by the outside parties. In order to ensure conformity, the researcher

recorded the participants' responses and documented the findings on the research journal as evidence for the outsiders to read and listen (voice recordings). Gray (2020:45) defines confirmability as the juncture at which others may verify or confirm verdicts or results. In order to be efficacious in this, during the interview processes, the researcher revealed her part in the project and permitted the participants to be in charge of their responses before the analysis stage.

### **3.9 ETHICAL CONSIDERATIONS**

Williams, Burnap and Sloan (2017:1152) argue that the ethics principle as per the research situational condition is matchless and is not probable simply to implement an ordinary model to guarantee ethical practice. Head (2018:5) argues that consequently, application forms for the ethical approval of the research include questions enticing the researcher to indicate potential benefits to participants to enhance education conditions concerning this study and the eclectic research community. Shayestehfard, Torabizadeh, Gholamzadeh and Ebadi (2020:3) argue that as to conform to the code of ethics, the participants were first updated about the determinations and then concealment of their given data and their feelings of extractions from the study at any pointed time, and were also well-versed about the procedure of examining the absolute outcomes. The ethical clearance was taken from the Faculty of Education Ethics Committee at the University of the Free State and followed the policy guidelines of the University for Research and Evaluation. The researcher acquired the ethical clearance certificate that endorsed the conduction of the interviews. Lefete (2018:101-102) argues that as a guarantee to protect the participants in the study, the participants were given informed consent forms to read and sign as an indication that they agreed to be participants in the study and to the conditions set. The main ethical issues were deliberated during the research development stage. Therefore, the safety of participants was ensured in such a way that they were referred to as anonymity, as indicated in the qualitative approach. Naido *et al.* (2018:82) argue that the names of the participants were concealed during the research process. The participants were given false names because protecting their identities is the researcher's responsibility.

### **3.9.1 Research ethics**

Bagdonaite-Stelmokiene and Zydziunaite (2020:75) argue that the research regulations include the most important ethical values: respect for participants, protection of dignity and reduction of anxiety, informed consent, and concealment. The researcher in this study received the ethical clearance certificate that allowed the researcher to conduct the interviews. In the context of cognisant research, it is precisely the interaction among these ideologies that leads to skirmish ambiguity. Head (2018:6) and Shayestehfard *et al.* (2020:5-6) argue that ethical sensitivity includes: cognition, emotion, knowledge, skill and responsibility, which is related to a caring relationship with the ability to receive others as they are. Therefore, the researcher avoided all the negative acts, conflict, and ambiguity by considering the participants' emotions and conducting the interviews with the most caring relationship.

### **3.10 SUMMARY OF THE CHAPTER**

This chapter clarified the exploration of teacher knowledge of information and communication technology (ICT) in curriculum practice. This chapter also explained the presentation, analysis, interpretation of data, and discussion of discoveries concerning the teacher knowledge in ICT in curriculum practice. The study aimed to develop a framework by adopting four objectives that are established to answer the research question. The research procedure was fruitful concerning the achievement of the objectives. The empirical data were created during the meetings, and the minutes were written down. Data was interpreted through qualitative data analysis. The findings were successfully presented. The next chapter is about the presentation, analysis, interpretation of data, and discussion of the findings.



## **CHAPTER 4 :**

### **PRESENTATION OF FINDINGS, INTERPRETATION, AND DISCUSSION**

#### **4.1 INTRODUCTION**

This study aimed to explore teacher-knowledge in ICTs, particularly in curriculum practice. The study prompted the knowledge of ICTs by teachers in curriculum practice to enhance, equip the teachers, and make use of the resources teachers of the Chris Hani District have in the Eastern Cape Province, predominantly in the rural areas. As confirmation of the aim of this study: the presentation, analysis of data, interpretation of data and the discussion of the findings associated with challenges justifying the need for a framework for the exploration of teachers' knowledge in ICTs in the curriculum. Data to be analysed and interpreted in this chapter was collected in chapter three of the study, and the essential techniques according to the explained steps quantified in chapter three. The data were interpreted based on the TPACK theory, which represents the strengths and weaknesses of the individuals as far as knowledge is concerned on a particular device. The following subsidiary research questions channelled the interpretation:

- Why do teachers have no interest in the use of ICTs, particularly in curriculum practice?
- What ICT knowledge do teachers have in relation to curriculum practice?
- How do the teachers use the ICTs in curriculum practice?
- What are the policy requirements regarding the knowledge of ICTs in curriculum practice?

A qualitative approach was used to respond to the questions. The participants consisted of two teachers per school –the school principal and one teacher. Principals were identified based on the management of curriculum, and they had to know the school resources, as those ICT tools belonged to the school. Voice recordings and the documented findings recorded in the research journal were also analysed. The data were procreated empirically in the presence of the interview members of each school.

It always membered the ethical motives, and the participants were named A, B, C, D, E, F, G and H.

The data were presented in the following ways: to break the ice or prepare the participants on the question, which is about the knowledge of the abbreviation, 'ICT', which was considered as the contextual information. Then lastly, a summary that vindicates all the phases engaged in exploring teacher knowledge in ICT in curriculum practice was discussed to give the findings directed by the literature.

## **4.2 INTERFERENCE PROGRESSION**

This section gives the background of the interference progression taken that generated data in this study. This section responds to how the participants responded to the interviews about teacher knowledge of ICT in curriculum practice, using a triangulation method under the qualitative in the analyses of data. Fusch *et al.* (2018:20) define Denzin's triangulation as the only method that analyses data and then presents the results to understand the experience of a common phenomenon. The researcher convened a meeting with the participants from the individual semi-structured interviews. They shared the challenges they experienced in ICT knowledge in curriculum practice, and possible solutions were discussed. In the gathering, the members identified three constituents of TPCK: content knowledge, pedagogical knowledge, and technological knowledge. Those constituents exposed the following challenges: espousing of technology into teaching can be both intricate and grim, lack of training to integrate technology in teaching, poor ICT infrastructure, particularly in the rural schools, lack of ICT support, and these challenges conversed with the members as to try to encourage understanding.

## **4.3 DATA CLASSIFICATION**

The data attained from the interviews were classified as follows:

- Interest in ICT
- ICT teachers' knowledge
- Knowledge of ICTs in curriculum practice

- Expectations on the knowledge of the ICTs
- ICT policy requirements

The table below represents the classes and the subclasses

**Table 4.1: Classes and subclasses**

| <b>QUESTION</b>   | <b>CLASS</b>                             | <b>SUB-CLASS</b>   |
|---|--|--|
| Why do teachers have no interest in the use of ICTs, particularly in curriculum practice? | Interest in ICT knowledge                | Benefits of ICT knowledge<br>Teachers' attitudes<br>Poor infrastructure<br>Security in schools   |
| What ICT knowledge do teachers have in relation to curriculum practice?                   | Knowledge of ICTs in curriculum practice | Lack of ICT support<br>Implementation of ICTs in curriculum practice   |
| What ICT tools do you know generally?   | Knowledge of ICT tools generally         | Availability of the ICT tools in schools<br>Teachers' access to ICT tools  |
| What do you expect to know with regards to ICTs?  | Expectations on knowledge of ICTs        | Develop education<br>ICT utilisation even if there are challenges.<br>Training on the knowledge and the use of ICTs.   |
| What are the policy requirements regarding the knowledge of ICTs in curriculum practice?  | ICT policy requirements                  | What does the educational policy say about education?<br>Teachers' perception regarding the ICT policy in schools.<br>What is the impact of ICT policy on education? |

### **4.3.1 Interest in ICT**

Sánchez Prieto, Trujillo Torres, Gómez García and Gómez García (2020:1) argue that teachers are in the process of adjusting themselves in the development of the digital skills they need in the use of Information and Communication Technologies (ICTs), a process that must be long-lasting and in which there are still knowledge gaps discouraging its implementation. Teachers interviewed all were interested in the knowledge of ICTs in curriculum practice. However, they stressed fundamental realities regarding this that hinder their interest, and these are poor infrastructure, no connection or poor connection, security and the unavailability of the computer labs.

#### **4.3.1.1 Benefits of ICT knowledge**

Teng (2017:24) argues that the efficacious implementation of ICT in curriculum practice relies on the understanding of ICT, which depends on teachers' technological knowledge, pedagogical content knowledge, which involves teachers' competence to combine knowledge of technology, pedagogy, and content. Teachers' attitudes or beliefs towards ICT integration in curriculum practice; therefore, it is judgementally essential for teachers to understand what ICT tool to use in a particular subject. Munyengabe *et al.* (2017:1) argue that the knowledge and the implementation of ICT tools in curriculum practice augmented curriculum processes in various forms. Almost all the participants know the benefits of ICT tools hence participants A, B and C said that knowledge of ICT tools can help make understanding the lesson to learners very easy. It can also make the learners enjoy the lesson presented to them, consuming time.

Participant D even said that the children they were teaching were so keen and interested in the ICT tools, and because of that, teaching could even continue beyond the classroom. Participant E even mentioned that the other benefit of ICT knowledge is that it could empower teachers in their content knowledge. Since teachers mainly deal with the learners, they have to transfer their knowledge to them, so they transfer the ICT knowledge to the learners. Muianga *et al.* (2017:79) argue that with the knowledge of ICTs, teachers' roles change from the proprietor of knowledge to an implementer of learning, observing students as a group of learners steering alongside their knowledgeable improvement procedures. Katsarou (2020:42) argues that ICT

tools can change teachers' roles as they become directors and guides through learning. Because of that, lesson objectives become more comprehensible, and knowledge can be analysed in depth. Only one teacher, namely participant E, mentioned the ICT benefit *to empower teachers in the content knowledge*. According to TPACK as the theoretical framework of this study, Miguel-Revilla, Martínez-Ferreira and Sánchez-Agustí (2020:1) argue that teacher educators can provide potential teachers with the ICT tools that can support the development of their technological pedagogical content knowledge. Participant F mentioned that the knowledge of ICT tools could even help teachers search for information. Teng (2017:1) argues that in schools, ICT advances or extends innovative schooling methods and erudition and effectively enhances students' knowledge results.

#### **4.3.1.2 Teacher attitudes**

Attitudes toward technology changes were decided to be added to the teacher variables (Aslan & Zhu 2018:26). Teachers wanted to know and learn new ways of using ICTs to convey instructional materials effectively and showed their willingness to incorporate ICT in their lessons frequently (Belay, Khatete & Mugo 2020:3). Romeu-Fontanillas, Guitert-Catasús, Raffaghelli, Sangrà, Romeu-Fontanillas, Guitert-Catasús, Raffaghelli and Sangrà (2020:31) argue that teachers' attitudes towards ICTs are conditioned by the resources available to them, the support they receive, the flexibility in the curriculum and the existence of motivational school culture. Almost all the participants have shown positive attitudes in the knowledge of ICTs in curriculum practice for the mere fact that they know the benefits of the knowledge of ICTs because some of the schools do have the ICT tools and some do not. However, even those facing so many challenges, like the poor infrastructure, which was already mentioned and a lack of support or professional development by the Eastern Cape Department of Education. The attitude of teachers towards technologies that they are encouraged and expected to use in their teaching is critical since this influences their willingness to actively use them in routine teaching and transfer the same enthusiasm of use to the students under them (Bii, Too & Mukwa 2018:1587-1588). Participant A, based at one of those schools sponsored with the ICT tools, said,

*“We did not receive training on how to use them in curriculum practice, and we are even do not know how to operate them. The only training we got was how to type and save work only, and even that training was not enough.”*

It would be impossible to use the ICTs in lessons since they do not know about even operating them, and they cannot transfer a genuine knowledge and enthusiasm of knowledge and use of ICT to the students. Rousey (2020:48) argues that negative attitudes were caused by poor knowledge in the utilisation of ICT tools in curriculum practice.

#### **4.3.1.3 Poor infrastructure**

Venkatesh and Sriraman (2020:1223) argue that infrastructure indicates to the mechanical organisations, such as road and rail network, bridges, electrical networks, ICTs (with internet connectivity and wideband quickness), reinforced by visible appliances of connected structures providing technologies needed to make things easier in the knowledge of ICTs. Rana, Greenwood, Fox-Turnbull and Wise (2020:2) argue that a shortage of internet, electricity, supporting infrastructure, and lack of securities in schools are the major challenges in the knowledge of ICTs in rural areas schools. Poor or lack of ICT infrastructures were the highest barriers to the knowledge of ICTs in colleges (Buah *et al.*, 2020:1). Furthermore, the policies have not focused on related infrastructures like ICT-based buildings, furniture, and subject-related software/tools (Joshi, 2017:411). Rana *et al.* (2020:40) argue that the government cannot deliver adequate funding for ICT infrastructure and teacher training on the knowledge of ICTs. Because the Eastern Cape Province is one of the poorest provinces in South Africa, according to the participants' reports, poor infrastructure is a problem in most rural schools. Participants indicated that they have interests in the knowledge of ICTs, particularly in curriculum practice since some of the schools do have laptops for learners, and they cited the benefits of the knowledge of ICT, for example, a teacher A said,

*“I have an interest in the knowledge of ICT, but the problem is the installation of the internet as it can make teaching easier due to our poor infrastructure, and teacher B said ICT can make teaching proceed even out of school.”*

All the participants have specified that their schools have no ICT based rooms or computer labs.

#### **4.3.1.4 Security in schools**

Rana *et al.* (2020:2) argue that a lack of security for ICT is a significant challenge in rural schools. Some of the participants' sites or schools are far away from the community, and some schools do not have security systems in their schools due to the poor financial status of the school because of the lesser number of learners. Crime such as burglaries is widespread in those schools, including those not part of the project. All the participants complained about the burglaries in schools as another reason that made an interest in ICT knowledge lessened.

#### **4.3.2 Knowledge of ICTs in curriculum practice**

Knowledge refers to information and skills acquired through experience or education (Mutavi, Aart, Van Paassen, Heitkönig & Wietland 2018:137). Camelo, Torres, Reche and Costa (2018:256) argue that the majority of the teachers do not change their teaching methods significantly due to the uncertainty and unfamiliarity felt by the teachers in the knowledge of ICT in curriculum practice. This is confirmed by participant A when she said,

*"I do not have enough knowledge in ICTs, and that is the reason we do not always use them in teaching and learning."*

Participants G, B, C said,

*"He knows how to utilize the ICTs on personal issues only, but not for curriculum practice."*

Suciningrum, Slamet and Hartono (2019:811) argue that the technology used in learning can be said as computer media and printed media because the results of printed media are from computer technology; hence, ICT media is a media-generated from computers and computer-assisted tools used in learning. All participants have certainty on how to type, save work and print on their computers. Participant E said,

*“She knows how to use the ICT tools as resources, not only as instruments, and she uses it to download from the websites (from the Internet café) or use a CD, and she even cited the subjects she uses ICT in like mathematics and life orientation.”*

Participant C also indicated that (from the internet café) he knows how to go to Google and download information, which he shared with the learners in natural science, geography and history. Participant H also indicated that she knows how to type programmes, CVs, drafting notes, award certificates and drawings, and she further explained that sometimes at school, together with the learners, they practice using ICTs, especially in subjects like English, mathematics, life skills, and arts and culture.

#### **4.3.2.1 Lack of ICT support from the officials**

The greatest challenge facing teachers in education today concerns the preparation of good quality teachers who are capable of using ICT effectively (Soh, 2020:2). Waghe (2020:613) argues that a lack of training focusing on the knowledge of ICTs, lack of institutional support through, non-involvement of teachers and school managers in implementing change and the lack of access to ICT equipment are the factors that led teachers with poor knowledge of ICTs in curriculum practice. Participant F confirmed that,

*“Technical problems such as lack of ICT facilities are among the negative aspects that hinder the effective exploitation of ICTs in the curriculum.”*

Buah *et al.* (2020:1) argue that lack or inadequate training to teachers also led to poor teachers' knowledge of ICTs in curriculum practice. Belay *et al.* (2020:2-3) further argue that teachers encountered problems implementing ICT in curriculum practices due to their inadequate knowledge and poor ICT skills to use ICT in their educational practices. Belay *et al.* (2020:2-3) argue that the available ICT resources were utilized to a shallow extent due to insufficient technical and academic support. All the participants' usage of the tools was minimal, even though they all had the ICT tools, and this was confirmed by participant A when she said,

*“Yes, we do utilise the ICT tools, but not on a daily basis because the problem is that we did not receive enough training.”*

Participant D highlighted the fact that,



*“I have little understanding of how to use the ICT tools for curriculum practice.”*

In addition, school supervisors do not provide adequate training and professional development for teachers to utilise ICT in the classroom (Baharuldina, Jamaluddin & Shaharom 2020:28). König, Jäger-Biela and Glutsch (2020:610) argue that even though the ICT infrastructure is necessary to utilise ICT in educational surroundings, teachers and students must also be inspired and supported in the knowledge of ICTs.

#### **4.3.2.2 Implementation of ICTs in curriculum practice**

Lameu (2019:47) argues that knowledge of Information and Communication Technology (ICT) is necessary to deal with its convolution. Hence, it is diverse because it involves various devices and is challenging because it demands precise environments in schools that some schools perhaps cannot afford. The knowledge of ICTs in education worldwide is neutral. Human choices will determine how ICT will be used and whether the revolution in information and communications technologies will benefit all human beings of all civilizations. Gupta (2020:1) argues that different technologies and ICT tools are being used in teaching-learning that facilitate learning today. It helps significantly in any type of emergency like the *CORONA Virus (Covid-19)* pandemic. The whole world is negatively affected by this dangerous pandemic, and every system is out of order, including education, which is badly affected. In many countries, lockdown exists, and all the schools and colleges are closed. In such a condition, many countries like India are trying to implement online learning in which ICT tools like mobile technology play an essential role in facilitating e-based education. For instance, many teachers are teaching via social network sites or mediums such as WhatsApp or video calling or any other method, which is easily accessible online and operates on mobile devices and many educational apps and platforms that are being used to deliver different types of education, are created. This is a different story for the rural teachers of the Eastern Cape Province in South Africa. They have challenges on the above sub-topic about infrastructure, which the participants complained negatively about. Sánchez Prieto *et al.* (2020:1) argue that as the educational setting becomes the prominent place to develop ICT skills that will assist teaching and learning, the teacher's figure increasingly stands out as a central actor in the development of learning such knowledge. Thus, teachers' digital competence,

understood as all the skills and abilities teachers have to successfully achieve the management and deployment of technology in the educational field, is crucial. De Freitas and Spangenberg (2019:1) argue that many mathematics teachers lack the knowledge of ICTs in curriculum practice and require a constant professional improvement plan of action to advance their technological pedagogical content knowledge (TPACK). Most of the participants have indicated that they know to use the ICT tools in some subjects, but they are unsure how to use them. Hence they even display the need for training in the knowledge and the use of ICTs in curriculum practice.

Participants C, G and H said,

*“...know how to use the ICT tools in all subjects. Participant D said he knows how to use the ICT tools in the subjects he teaches, but highlighted the fact that unavailability or poor network accessibility is a challenge.”*

Mlambo, Rambe and Schlebusch (2020:2) argue that some educators know how to successfully implement ICTs in their teaching spaces in a ‘generative’ and constructive way.

Participant E said,

*“She knows how to use the ICT tools in subjects like mathematics and life orientation, and she emphasised that she uses the ICT tools as resources, not as instruments.”*

Participant A said,

*“She knows how to use the ICT tools like TV and calculators in subjects like mathematics and language where the learners listen to the stories from the radio. She further said that she has little knowledge on the use of ICT tools like laptops, tablets, desktop, overhead projector and she further emphasised that not having Wi-Fi in rural school is a challenge.”*

Participant B specified,

*She knows how to use TV whereby learners listen to the stories. The ICT tool like the laptop she has no knowledge on how to use it and even left it at home when she goes to work.”*

Lisene and Jita (2018:112) argue that some of the barriers in ICT knowledge, as identified by researchers, include lack of self-assurance, not having enough time for

ICT practice, unsuitable software, inaccessibility in ICT tools, restrictions in curriculum, inadequate backing, shortage of knowledge in relation with ICT utilisation, accentuating that the circumstances of schools can also be a barrier to ICT knowledge, and in turn also discouraging teachers in the knowledge of ICTs. The overwhelming consequences of these challenges seem to be positive because some teachers have shown a positive attitude in the knowledge of ICTs.

#### **4.3.3 Knowledge of ICT tools generally**

Razali (2019:59) argues that ICT knowledge includes understanding the ICT tools like the internet, digital video, interactive whiteboards, and computer software (Zhou, 2019:1906) argues that it is vital for teachers to understand the positive influence of ICT in curriculum practice and know which to use and how to use it on a particular subject. Odell, Galovan and Cutumisu (2020:1) argue that in the 21st-century digital outlook, Information and Communication Technology (ICT) becomes an essential tool in the process of intelligent facts from fiction in technologies such as “Interactive whiteboard, Cameras, Laptops, VLE (Virtual Learning Environment), Blogs”, PCs, Internet, Emails, Lasers, Facebook, YouTube, Intranet, Cat-cams, Projectors, Microscopes, Podcasts, Various software”, etc. All are in the array, which could be found in many places or classes in some educational systems. Yang (2019:130) and Hernandez (2017:341) argue that teachers and students are currently using technological tools to facilitate learning. This development began early on with the emergence of calculators, TV sets, voice recorders, among other things, that show that ICTs have become educational resources, with efforts to improve the learning demand of the knowledge and the use of ICTs in curriculum practice. The participants know of some of the ICT tools generally. Teachers’ individuals from the semi-structured interviews cited the following ICT tools: laptops, desktops, tablets, televisions, overhead projectors, routers, calculators, cell phones, tablets and so forth. Avaghade (2020:802) argues that being deprived of suitable infrastructure and ICTs will lead to the deficiency of knowledge in ICTs. That is why the researcher suspects that teachers do not have adequate knowledge of the ICT tools. They are not acquainted with them due to poor infrastructure, which impedes installing those resources.

#### **4.3.3.1 Availability of ICT tools in schools and teacher access**

Spiteri and Rundgren (2020:115) argue that ICT tools are extensively available in some schools; however, the results from international studies indicate that they are not effective towards students' educational achievement due to the following reasons: poor teacher knowledge of ICT by some teachers, poor attitude towards the use of ICTs, deficiency of knowledge in ICTs in teachers and lack of adequate ICT tools. Saputri, Fajri and Qonaatun (2019:204) argue that the current education structure improves through expedient access to the ICT tools. The state supports that to improve technology in curriculum practice. Waghe (2020:610) argues that teachers must have adequate admittance to better-quality ICT tools and the internet in their classrooms and the school. Walubengo and Takavarasha (2017:7) argue that unequal accessibility to ICT tools, unequal experiences, demographic and technical stratifications that produce classes of winners and losers, which result in the unaffordability of access to the ICTs, due to the high costs and poor status of the rural schools, results in the digital divide. This is an ICT divide in the sense that some schools do have ICT tools in their schools that were sponsored to them and some do not have and that those teachers who have the ICT tools to at least have access to as they are available. All participants who have laptops provided by the government have access to the ICT tools, and those who also have laptops that belong to the school said that they have access. Participants E and F emphasised that,

*“Yes, we have access to the ICT tools, especially now that the ECDoE (Eastern Cape Department of Education) has provided all teachers with laptops.*

Participants B and C said,

*“We have access to the ICT tools that were provided by the ECDO, and they even keep them in their houses due to the insecurity of the school, and they do not afford to buy any for the school because of expensiveness.”*

Participants A, D, G and H said,

*“We have access to the ICT tools provided by the ECDoE and even to those that are available or belong to the school.”*

#### **4.3.4 Expectations on the knowledge of ICTs**

ICTs can benefit both teachers and learners by creating a more interactive language classroom, motivating learners and providing authentic language input from real-life situations (Trinh, 2018:74). Dumlao (2020:39) argues that ICT tools are primarily used as additional tools that can boost classroom communication. Razali (2019:58) argues that ICT knowledge can advantage teachers to implement the ICT tools in extremely winning ways to create a classroom atmosphere at school more refined, innovative, and compliant to the fluctuating span of ICTs. Educator schooling is further appealing and operational. Schoolchildren can apprehend the notions imparted, develop the distinction of the knowledge situation, and advance learner accomplishment. However, it remains a prerequisite for teachers to excel in ICTs in curriculum practice. Munyengabe *et al.* (2017:7095) argue that with the knowledge of ICT's teachers' skills, confidence and passion improved. ICT tools serve as teachers' powerful tools for the different educational activities. Teachers benefit from the full access of being up-to-date with their school work and the pupils' interaction with teachers anytime and anywhere. Tembrevilla (2020:17) argues that one of the most significant challenges is how governments, school administrators, principals, and, more importantly, the teachers can maximize modern learning with the knowledge of ICTs to support teaching and learning schools are shut down. Hence technology allows the closing of some training gaps even during school closures.

##### **4.3.4.1 ICTs develop education**

Mlambo *et al.* (2020:2) argue that the 'propagative use of ICTs' involved is when educators can successfully know how to use the ICTs in curriculum practice in a 'generative' and constructivist way in which their ICT practical beliefs and knowledge of ICTs are fundamental in order for the education to be fully developed. ICT has brought many changes in the field of education. As we can see, the innovations in the teaching and learning process have been enhanced, and EFL teachers and learners use different technological tools to make the educational process successful (Abdurahmonov, Samandarov, Tolibjonov & Turdiyev, 2020:132). Gupta (2020:758) argues that previously no country could proceed without using technology in its different sectors and cannot develop education systems appropriately without using

ICTs. ICTs enhance teaching strategies, improve student-centred learning, support knowledge construction, develop basic education and literacy, etc.

Participant A said,

*“The ICTs make teaching and learning very easy, and the education is developed in the sense that in our days we as teachers use ICTs to type instead of writing on the board and learners will be more understanding in the use of ICTs hence they are the ones who are curious because most of them use cell phones in their homes.”*

Participant B said,

*“Through the knowledge of ICTs, teaching and learning can be more effective, and that can even develop education.”*

Participant C said,

*“ICTs develop education because through the knowledge of ICTs we can have access in the educational information of other countries and it opens the minds of our learners not to depend on teachers only for the information.”*

Participant D said,

*“Education can, through the knowledge of ICTs in curriculum practice education, can be developed by the use of Google as to source an information and our cell phones can capture pictures and share that information with the learners.”*

Participant E said,

*“The knowledge of ICTs can develop education when we as teachers not depend on the textbook in order to get information, we can download information from the websites or use the USB, and even learners can be able to research information on their own.”*

Participant F said,

*“Through the knowledge of ICTs, education can be developed. ICTs will bring strong support, particularly in curriculum practice. Learners’ performance will be improved since they will no longer rely on one source for information.”*

Participant G said,

*“The knowledge of ICTs can develop education because teaching and learning will be able to proceed even outside the classroom through the use of WhatsApp, and information will be obtained via Google.”*

Participant H said,

*“Knowledge of ICTs can develop education when many teachers acquire the educational skills and knowledge on the use of ICT tools, and that will be transferred to learners.”*

#### **4.3.4.2 ICT utilisation, even if there are challenges**

The utilization of ICT in the education sector is essential to enhance the teaching and learning experience of members of the education institute and increase productivity, efficiency, and effectiveness of employees within any organization (Azahari, 2020:13). Barote and Pathan (2020:101) argue that through the knowledge on the utilization of ICTs, the advantage is for teachers to be capable in the practice of ICTs in curriculum practice anytime and anywhere. Trinh (2018:74) argues that another way to use ICT in language learning includes utilizing ICT as a machine, a tool, and a platform for communication. Teachers need ICT to capture learners' attention during a lesson; therefore, it is essential to use ICT to capture learners' attention. Huang *et al.* (2020:8) argue that teachers should use the Open Educational Resources (OER), published by the MoE, which is available online for teachers to improve their knowledge.

Participants A and H said that ICT makes understanding learners very easy and consumes time. Participant B responded like this,

*“Through the utilization of ICT, teachers believe that they can technologically help the children and teaching and learning can become very easy, but the problem is the internet.”*

Participant C responded like this,

*“ICTs empowers learners with the 21st-century skill, it makes learners to enjoy the lessons, and it is also easy for the learners to understand something when they see it.”*

Participant D said,

*“Utilization of ICT can even make teaching and learning to continue even beyond the classrooms.”*

Participant E said,

*“Through the utilization of ICT, learners would be empowered with the technological skills and teachers would be enriched in the curriculum practice.”*

Participant G said,

*“...by utilizing the ICTs learners and teachers are equipped as to fit in, in the current situation because technology is here to stay.”*

#### **4.3.5 Training on the knowledge and the use of ICTs**

Sointu, Valtonen, Hirsto, Kankaanpää, Saarelainen, Mäkitalo, Smits and Manninen (2019:3) argue that elements like organisational and influential support, the convenience of the ICT tools, teaching with knowledge and attitudes to transformation, make it problematic to have the knowledge of ICTs in curriculum practice. As a teacher with some experience of teaching, initially without the knowledge of computers and later with quite some mastery, if not expertise over computers, the researcher would like to bring home a point through this paper and that is – ICT educational software, computers with access to the internet and other educational software definitely make excellent teaching tools, especially in teaching languages (Sonawane, 2020:82). Yang (2019:130) argues that ICT knowledge amongst teachers is dependent on their personalities and experiences and in ICT policies and school circumstances in which they work. With regard to “personal and professional lives”, the “individual expertise” is significant, other than the external factors with the expertise, which is associated with knowledge and skills, hence the expert teachers are passionate in the teaching and learning activities. The only impediment during the pandemic in RNM (Republic of North Macedonia), which seemed to be difficult for the teachers, was the lack of such platforms in native languages and training for professional use (Shaqiri, 2020:16). Concerning this sub-topic, *participants A, D, G and H* indicated that they did get training on the computer essentials like opening and closing the computer, typing,



saving the work, creating the folder, and inserting the tables was not ample. Participants B, C, E and F did not receive the training.

#### **4.3.5.1 ICT policy requirements**

Tairab and Ronghuai (2017:71) argue that government policies, mainly the ICT policy, are the most significant policy to be executed in schools to promote the role of ICT in the educational system. However, unfortunately, its issues are also one of the main challenges facing schools in utilising ICT tools. VO (2019:17) argues that sequential scrutiny of the nation-wide policies allotted by the Vietnamese government, MoET and the 2020 Project was commenced to classify noticeable facets that were anticipated to support the enactment of ICT to improve curriculum practice. Van der Waldt (2018:2) argues that the National Broadband Policy of 2013, together with its supplementary plan, left a countenance to South Africa's apparition of "a coherent knowledge that is more wide-ranging, unbiased and affluent." Munyegabe *et al.* (2018:1) argue that the assimilation of Information and Communication Technology (ICT) Policy in all levels of education in other countries was one of the main objectives in raising the standards of the ineffective centralised education system. The government in those countries aims to achieve middle-income prestige by 2020, remodelling ICT towards an information-rich, knowledge-based society and economy. Van der Waldt (2018:2) argues that the Eastern Cape Province consists of rural schools with limited access to the internet, and ICTs often lack sufficient knowledge to meet a variety of advancement aims.

#### **4.3.5.2 What does the educational policy say about ICT?**

VO (2019:25) argues that office staff, teachers, and educational administrators were made cognisant of the significance of ICT in education according to the Vietnam policy. All educational institutions had to create websites and provide staff, teachers, and students with email addresses. Teachers were anticipated to implement appropriate ICT applications that generated state-of-the-art teaching and learning methods, and ICT applications were promoted in teaching and management. Rana *et al.* (2019:1) argue for a firm policy for the foundation of ICT in curriculum practice, which will

accentuate the necessity for ICTs to improve education globally. Mhlanga and Moloji (2020:7) contend that the South African government announced that the departments of communications, digital technologies and basic education had joined forces to ensure virtual learning is a reality during the nation-wide lockdown and due to the closure of schools during the lockdown and to alleviate the impact of COVID-19 on the education sector. The other reason was that the country was not prepared for the disruption and as a result, bringing in virtual classes was a way to find possible ways in which technology could help address the disruption of COVID-19 (Mzekandaba, 2020).

On the above topic, Participant A responded as follows:

*“ICT allow new ways of teaching and learning, and it also allows students to have access to curriculum in or out of the classroom even when they are in hospital or at home.”*

Participants E and F responded by saying,

*“In any country, curriculum developers must accommodate ICT learning, and every curriculum is guided by policy. In my understanding, this policy must accommodate the diversity of the society in terms of development, financially, culturally, politically etc.”*

Participant D responded as follows:

*“ICT policy is meant to fast track communication between the different levels of basic education from national, province, district, circuit management centres and schools.”*

Participant G and H said,

*“The policy must make all the stakeholders be aware of the ICT and be accountable for any damage happened in the devices.”*

Participants B and C said,

*“The ICT policy must include the creation or the development of the proper infrastructure and the human development on ICT.”*

#### **4.3.5.3 Teacher perception regarding the ICT policy in schools**

Asongu and Odhiambo (2018:4) and Munyengabe, He and Yiyi (2018:2) argue that applying ICT skills in an education system is compulsory because it is significant among skills prerequisite for the 21st century. VO (2019:48) argues that operative ICT training contributes to teachers' positive beliefs in ICT use, thereby reducing their levels of anxiety strengthening their views on the value of using ICT and their capabilities to master it. Tairab and Ronghuai (2016:74) argue that other countries have prepared a structure for ICT in schools, teachers are provided with training on ICT in the curriculum and nation-wide standards. Yeop, Yaakob, Wong, Don and Zain (2019:777) argue that virtually, experienced teachers should be exhilarated to be actively involved in technology-related tasks as they are likely to flourish in integrating technology into the learning process, as much as the experienced teachers need more exposure regarding the benefits, knowledge and skills of ICT in an exertion to shape the perceptions of their experiences. Aziz (2020:10) argues that with the NIP (National ICT Policy), one of the challenges of the NIP is non-considerations of the poor infrastructure and the lack of social security and resources in remote areas, which creates gender incongruence, and thus less access to quality education and study facilities. In this context, ICT (skills) programmes beyond formal education are crucial in reaching out to diverse groups and those living in remote parts of the country.

Concerning this subtopic 4.4.2, Participant D said,

*"It is expected that at school levels an ICT which comprise of ICT co-ordinator, teachers, admin personnel and a parent be set up and then that committee should then form/craft an ICT school policy."*

Participant A said,

*"Students with special needs are no longer disadvantaged; hence access to essential tools can be used by students to make use of ICT for their own educational needs."*

Participants E and F said,

*"In my point of view, ICT practice must be treated as a three-dimension aspect. The first aspect is the understanding and the ability to use ICT as equipment or device for communication, storage and as a means of socialising. Secondly, computers must be used as a resource in the classroom. Thirdly, the policy must accommodate the study*

*of ICT as a science, and it must also clearly state the rights and responsibilities of the educator, the learner and the parent.”*

Participants G and H said,

*“Parents must take responsibility and assist learners to keep ICT devices safe when at home.”*

#### **4.3.6 What is the impact of ICT policy on education?**

To the researcher’s understanding, the policy is supposed to have a lot of positive impacts. However, because of the challenges mentioned in the sub-topic 4.3.2.2 that primarily affects rural areas, the participants do not have much to say. The researcher believes that the urban schools are the ones that benefited from the positive impacts. Waluyo (2019:72-73) argues that ICTs is one of the areas that have received significant impacts on education, as ICTs have encouraged the improvement of teaching approaches and the ways students learn. The school leader’s visions primarily influence the implementation of ICT in schools and the knowledge and impact of ICT in the curriculum.

In contrast, technological tools and resources in school assisted students in searching for information, designing products, and publishing results. Kassongo and Tucker (2018:3) argue that in South Africa, an ICT4D programme is obstructed by a deficiency of honourable empowerment in determining the capability to implement a sound e-government strategy (Kassongo & Tucker, 2018:3). Selwyn (2020:129) argues that the NGfL strategies indicated that once all schools are technologically ‘connected’, the government’s target is to advance a ‘variety of interconnected systems and facilities’ providing educators and learners with collaborative ICT tools equipped with enough knowledge and the intention to interconnect with other people locally, nationally and internationally, will be satisfied.

Concerning the above sub-topic that is 4.4.3, Participant A said,

*“ICT will motivate teachers and learners in the activities, improve engagement and knowledge retention.”*

Participant D said,

*“ICT creates a platform for engagement and sharing of information.”*

Other participants did not respond.

#### **4.4 SUMMARY OF THE CHAPTER**

This chapter provided the presentation, analysis, interpretation of data, and discussion of findings on ICT knowledge by teachers in curriculum practice. The study aimed to explore teacher knowledge of ICTs in curriculum practice using the five objectives. The research process was a triumph regarding the achievement of the objectives. Data were generated during the meetings with the participants from different schools, and the minutes were taken. Voice recordings were also done during the collection of data.

## **CHAPTER 5 :**

### **SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH**

#### **5.1 INTRODUCTION**

This study explored teacher knowledge in information and communication technology in curriculum practice. This chapter conveys a brief background of the study and the challenges encountered prominent to the teacher knowledge of ICTs in curriculum practice and outlines the problem statement that ensued in the aim of the study and research question. Subsequently, the research questions that funnelled the structure of the study were also presented. The chapter then describes the findings related to the challenges mitigating the need for the teachers' knowledge of ICTs in curriculum practice. This chapter also summarises the findings, draws a conclusion that will divulge the value of the study in the knowledge of ICTs in curriculum practice, and recommends knowledge of ICTs in curriculum practice and suggestions for further studies.

#### **5.2 BACKGROUND OF THE STUDY**

The main objective of the research was to explore teacher knowledge in ICTs in curriculum practice. Teachers must have knowledge of ICTs in curriculum practice. Mlambo *et al.* (2020:1) argue that ICT tools will become a permanent aspect in 21<sup>st</sup>-century classrooms, even though their essential and effective use is still not recognised in South Africa, mainly in rural schools. Gupta (2020:758) argues that currently, no country can go ahead without using technology in its different sectors and correspondingly, it cannot develop education systems appropriately without using different ICT tools; hence they are the most essential in enhancing curriculum, making student-centred learning, supporting knowledge construction, developing basic education and literacy, etc. That is why the researcher perceives teacher knowledge of ICTs particularly in curriculum practice, as a need to be explored to find out what knowledge teachers have concerning ICTs, particularly those in the EC Province in SA.

Trinh (2018:74) argues that the ICT tools like visual aids, sounds, video clips or animations motivate students, tempt their attentiveness, and promote their curiosity in knowledge since the critical factor in the learning process is the learners' attention. Therefore teachers need to capture the learners' attention using ICT tools during a lesson. Sointu *et al.* (2019:2) argue that the importance and awareness and the role of technology are over stressed in our time. Muianga *et al.* (2019:1) argue that the education sector must prepare students for the changing situations of most jobs in the 21<sup>st</sup> century. Sointu *et al.* (2019:4) further argue that teachers should consider an innovator tactic in transformation and advancement in ICT. Because some schools have no ICT tools and others have infrastructure challenges, and some teachers have no technological knowledge, the knowledge that affects curriculum practice changes is sometimes insufficient. Hence the inadequate knowledge teachers have, is exposed. That is the reason why the researcher explored teacher knowledge of ICTs in curriculum practice as to expose the necessity of ICT training to those who have little, no knowledge and even those who know how to use the ICTs for personal issues, not forgetting those who have the basic knowledge on the use ICTs. In the case of those teachers who are the experts in the knowledge of ICTs in curriculum practice, the researcher intended to emphasise motivation in using ICTs in curriculum practice.

### **5.3 THEORETICAL FRAMEWORK**

In order to understand the circumstances resulting in this study, the Technological, Pedagogical Content Knowledge (TPACK) was effectively implemented to attain the study's objectives. A lack of technological competence does not mean that initial teacher training should focus attention on TK exclusively; rather, the focus should be on TPK and TCK (the interaction of technological knowledge with pedagogical and content knowledge), following a comprehensive model (Miguel-Revilla *et al.*, 2020:8). Lisene and Jita (2018:111) argue that teachers with low TPACK may indicate that they used ICTs to get more information about the content rather than for curriculum practice. For example, learners in many countries are often restricted by modern technologies; therefore, there is a prerequisite for educators to take advantage of ICTs in the school and classroom settings, and there is thus an urgent prerequisite to

upsurge the support for teachers to maximise the use of ICTs for teaching and learning.

## **5.4 PROBLEM STATEMENT**

Teachers of schools in the Eastern Cape Province in South Africa were supplied with computers by the Department of Education. In addition, a further 12 schools were sponsored by companies, such as Telkom and ITEC. These computers were to be used by teachers. However, these gadgets are not in use, and the reason is not apparent. Some teachers, especially in rural schools, seem to have no interest in the use of these gadgets, particularly for curriculum practice, yet they do acknowledge the benefits of ICTs. Therefore the need to explore why teachers, especially in rural schools, have no interest in the use of ICTs, particularly in curriculum practice.

### **5.4.1 Research question**

Concerning the above discussion, the study answered the following research question:

*What knowledge of ICT in curriculum practice do teachers have?*

### **5.4.2 The aim of the study**

The study aimed to investigate teacher-knowledge of ICTs, particularly in curriculum practice.

### **5.4.3 The research questions**

The presentation of the findings was based on the following research questions:

- Why do teachers have no interest in the use of ICTs, particularly in curriculum practice?
- What ICT knowledge do teachers have in relation to curriculum practice?
- How do the teachers use the ICTs in curriculum practice?



- What are the policy requirements regarding the knowledge of ICTs in curriculum practice?

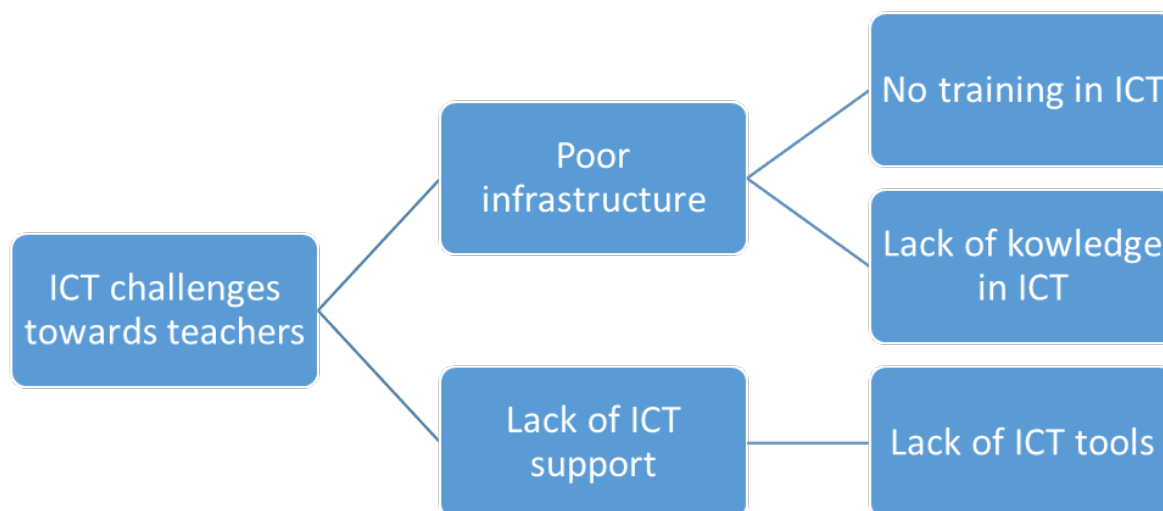
## **5.5 FINDINGS AND RECOMMENDATIONS**

This section offered the findings and recommendations of the study as they occurred from the literature and during the analysis process in chapter four. They are as follows:

- a) Poor infrastructure and security, particularly in rural schools;
- b) Lack of ICT support;
- c) The need for training on the knowledge and the use of ICTs;
- d) Lack of knowledge of ICTs, particularly in curriculum practice;
- e) Lack of ICT tools in some schools; and
- f) The inability of teachers to equip learners technologically in preparation for 21<sup>st</sup>-century skills.

### **5.5.1 Findings and recommendations related to justifying the need for teacher knowledge of ICTs, particularly in curriculum practice**

This section offered the findings and recommendations for further research related to the challenges identified for justifying the need for teachers' knowledge of ICTs in curriculum practice. Figure 5.1 below displays all the ICT challenges towards teachers as revealed by the participant: poor infrastructure, no ICT training, lack of knowledge in ICT, lack of ICT tools, and lack of ICT support.



**Figure 5.1: Challenges identified for mitigating the need for teachers' knowledge of ICTs in curriculum practice**

### **5.5.1.1 Poor infrastructure and security, particularly in rural schools**

Avaghade (2020:802) argues the curriculum will not be triumphant without appropriate infrastructure amenities comparable to power, libraries, connectivity, ICT tools, and the support from teachers, parents, educational experts, etc.

Poor infrastructure is one of the causes that made the knowledge of ICTs in curriculum practice by teachers in rural schools insufficient. They ended up losing interest in the knowledge and ICTs in curriculum practice. Soh (2020:2) argues that the education structure authorised by ICT-powered sub-structure can have excellent chances to bring forward to the centre phase and guarantee academic distinction, excellent teaching and management in a body of knowledge in teachers.

The literature review exposed the technological gap (caused by poor infrastructure) in most primary school learners and teachers in rural areas. That encouraged the researcher to pay attention to teachers and the complications they encountered in the

knowledge and the use of ICTs in curriculum practice. Teachers are the main drivers in educational settings (see 2.1). Insufficient funding for education and its infrastructure appears to be the biggest obstacle (Jena, 2020:27). In order to address the challenge related to poor infrastructure and security, particularly in rural schools, the literature suggests that access to ICT infrastructure can disseminate teacher knowledge in ICTs (see 2.3.2).

The findings that emerged from this study exposed that poor infrastructure like a lack of high-quality internet, electricity, a lack of hydropower, low solar energy, etc. in the rural schools are the main challenges that made it difficult for the teachers in those areas to be lacking in the knowledge of using ICT tools, particularly in curriculum practice. This is the leading and unresolved challenge faced by rural schools because the government of this province cannot provide sufficient funding for ICT infrastructure and teacher training in the knowledge and how to use ICT (see 4.3.1.3). The findings revealed that all teachers do have an interest in the knowledge of ICTs, but their complaint was on the poor infrastructure (see 4.3.1.3).

The recommendation from the study is the knowledge of ICTs by teachers first then learners because currently, this knowledge is essential because of so many challenges that affect South African education in a bad way. The COVID-19 pandemic opened the eyes of the South African government to pay attention to the importance of ICTs, specifically by teachers in curriculum practice even in the rural schools, because the rural teachers and learners were inept at proceeding with the educational activities due to poor knowledge.

#### **5.5.1.2 Lack of ICT support**

De Freitas and Spangenberg (2019:3) argue that the less or no access to ICT tools by teachers who are committed to the knowledge and the use of ICTs has triggered an international cry for continuous professional development (CPD) to support teachers' adequate knowledge and use of ICTs in curriculum practice. Waghe (2020:613) argues that deficiency of proper support in the training of teachers and school principals in ICT knowledge and planning are the exposed indications that cause teachers not to be interested in the knowledge and the use of ICTs in curriculum practice. Pantzos (2019:193) argues that lack of support from school administration

and insufficient financing of teacher professional development on ICT in teaching are the hurdles that make the knowledge and the application of ICTs challenging.

Unequivocally teachers need support in ICT knowledge, particularly in curriculum practice from the government and the departmental officials, in order for them to equip the learners with the necessary skills of the 21<sup>st</sup> century, and motivation is one of the principal values of constructivism in terms of teaching and learning (see 3.2.2). The findings exposed that some of the teachers, although they have the ICT tools, did not use them daily because they did not receive the ICT support from the ICT experts from the ECDoE, which leads to them having no knowledge or little knowledge. They were also not sure about themselves in the knowledge and the use of ICT, particularly in curriculum practice. Some of them had personal knowledge in using ICTs, but not for curriculum practice (see 4.4.2.1). The community or the police services have to participate in teachers' support by ensuring that the school is secure enough to avoid the burglaries that result in the pilfering of the ICT tools because the school is their own asset and not for teachers only (see 4.3.1.4).

A recommendation from the study is that further research is needed on the support of teachers in the knowledge of ICTs in curriculum practice.

### **5.5.1.3 The need for training on the knowledge and the use of ICTs**

Power, Musgrove and Nichols (2020:63) argue that a necessity for the ICT tools and support is the significance in the knowledge and the utilisation of ICTs in curriculum practice. Berrios-Aguayo, Molina-Jaén and Pantoja-Vallejo (2020:145) argue that ICT managers typically are the people with the extreme knowledge and understanding of digital tools with the following duties: guidance to other teachers on the available ICT tools, news, and existing updates, as well as the best training regarding the knowledge and the use of ICT within school contexts; dynamisation in the use of ICT in curriculum practice, thereby encouraging communication within the educational environment; synchronization of ICT plans in the centre, the resolve of incidents/conflicts, and teacher training, as well as administration and control of ICT procedures to be carried out. Teachers need continuous professional development programming to maintain their pedagogical skills and need access to well-equipped classrooms with technology and tools (Alrwaished *et al.*, 2017:6115).

Teachers must get acquainted with the recent ICT tools and their application in teaching and learning (Awatale & Mishra, 2020:174). Furthermore, some factors still appear as challenges in taking up ICT as a mode of education in our nation, which prominently include insufficient funding, want of training among teachers and inadequate incentives to the stakeholders to adopt ICT (Jena, 2020:24). The training of teachers on the knowledge and the use of ICTs is essential for them to be self-assured and be able to teach in the classroom and not be undermined by some of the learners of today who are more advanced in technology (see 2.7.2). Today's teachers face the challenges of the unsureness in the knowledge and the use of ICTs in curriculum practice due to lack or no training, less institutional support, and the lack of access to ICT tools. This lack of support from all the related technological aspects leads to poor teaching and learning (see 4.4.2.1). The collaboration of the stakeholders like leaders, teachers, related service providers, etc., can strengthen the support of ICT in curriculum practice (see 3.4).

The study's findings revealed that teachers in rural schools did not receive support from the school administrators; the only support they got was the provision of the ICT tools without training (see 4.4.2.1).

The recommendation for further research is to explore the educational administration on teachers' support or development in ICTs for curriculum practice.

#### **5.5.1.4 *Lack of knowledge of ICTs, particularly in curriculum practice***

Teachers are not competent enough to use the tools with ease and precision (Shende & Reddy, 2020:155). Waghe (2020:610) argues that it is essential for teachers to have relevant knowledge and skills to use new digital technology so that they can be able to help learners with the technological skills and knowledge. Without relevant ICT knowledge, teachers cannot fully accomplish curriculum practice. It is crucial to continue examining teachers' knowledge on ICT integration to collect the evidence required to develop improvement strategies (Lisene & Jita, 2018:111).

Knowledge of ICT is a critical factor since currently, almost everything is based on technology (see 2.1.1). South African teachers and learners have agonized a lot during the COVID-19 pandemic due to a lack of knowledge in ICT. In contrast, other

countries, already exposed to or have knowledge of ICT, did not. It is significant for teachers to have ICT knowledge in curriculum practice, which must be instilled in learners to prepare them for any emergencies they can encounter in the long run or future. Some teachers in schools did not change their way or methods of teaching because they did not know using the ICTs in curriculum practice; they only used some of the ICT tools like cell phones and tablets for their personal issues, and in the case of laptops, some of the teachers only know the basics like typing, saving the work, opening and closing the computer (see 4.4.2). Nevertheless, even today, most ICT users are using technology only for presentation and demonstration (Shende & Reddy, 2020). Some teachers are not sure about themselves with the knowledge of ICTs even though they use them in some subjects.

The findings exposed that some teachers can use the ICT tools in some subjects, but not guaranteed, and others only know the ABCs (basics) of the computer skills.

Recommendation for further research is that the researchers have to explore the encouragement of teachers in the knowledge and the use of ICT tools, specifically for curriculum practice.

#### **5.5.1.5 Lack of ICT tools in some schools**

Belay *et al.* (2020:4) argue that the efficacious knowledge of ICTs, particularly in curriculum practice entails the accessibility of ICT tools, teachers' attentiveness on ICT knowledge, and teachers' outlooks. Vanlauwe, Blomme and Gaidashova (2018:90) argue that knowledge occurred from the improved accessibility of the ICT tools and internet.

ICT tools are supposed to be available and accessible to all educational parties, especially teachers, because they are the main drivers in the curriculum; likewise, provision of the technologically advanced backing team is essential to instil the knowledge of ICTs in curriculum practice teachers (see 2.3.4). Some teachers in the Chris Hani District in the Eastern Cape Province in South Africa have computers to use in teaching and learning. Some teachers have none for the learners, and only those that belong to the teachers, and that lead to the loss of interest in teachers in the knowledge of ICT because they were incompetent to use them in the class together

with learners who had their own gadgets (see 3.6.1.1). Even those schools that have laptops for the learners are also unable to use them in the class with the learners because there are no computer labs and no internet (see 3.6.1.4).

Findings exposed that some schools have laptops even for the learners and some schools do not have and that made teacher knowledge of ICTs in curriculum practice become insufficient. Poor connection, unavailability of computer labs and no security in the schools in rural areas also obstruct the interest of teachers in the knowledge of ICTs in curriculum practice.

Recommendations are that the researchers have to explore what can be done in the rural schools in order for them to have a connection, even though the infrastructure is poor, as well as why some of the schools have no computer labs and what need to be done by the government for the security of the ICTs in the rural schools.

### **5.5.2 The inability of teachers to equip learners technologically in preparation for the 21st-century skills**

Hafifah (2020:11) argues that three influences sway educators' utilisation of ICTs: (1) Individual (outlook) sentiment of similar contented and relishing utilising ICT throughout educating, (2) Communal (personal medians) pressure from departmental leaders and the departmental heads, and (3) Authority (alleged department power) like; educators' competences, understanding and expertise in utilising ICT brilliantly and effectively for educating. Rajeev and Shreyansh (2020:37) argue that the growth in ICT knowledge, particularly the remaining uses of ICT in the 21st century, will shape education as a whole because ICT is the machine for accomplishing the contemporary goals of the national curriculum. Teachers as the drivers in curriculum practice are critical to have adequate knowledge in ICT to equip the learners for 21<sup>st</sup>-century skills. The literature reviewed disclosed an ICT knowledge gap in some teachers. The study exposes that teachers' knowledge of ICTs is in huge demand because it can make the curriculum progressive even outside the classroom or even if the teachers and learners are in their homes. Through teacher knowledge of ICTs, even in the occurrences that affect the country at large, which may cause the teachers and learners to be not at school, the teachers and learners will not be affected even in the rural schools, and they will manage.

### **5.5.3 Findings and recommendations related to the identified components of a framework**

This segment will pinnacle the findings and recommendations associated with a framework's identified components.

#### **5.5.3.1 Teachers' interest in ICTs**

De Freitas and Spangenberg (2019:3), Katsarou (2020:42), and Obielodan *et al.* (2020:63) argue that some teachers either scorn ICT knowledge assimilation or are not aware of ICT benefits on teaching, and ultimately they are not interested in the knowledge of ICTs. De Freitas and Spangenberg (2019:3) further argue that the issue of technology teachers who are not sure about their knowledge has triggered an international cry for continuous professional development (CPD) to support mathematics teachers' effective use of ICTs in the classroom.

Buah *et al.* (2020:163) argue that tutors (the teachers) and student-teachers (the learners according to this study) may have no required skills to access, process, and use information in a manner that could quickly advance teaching and learning. Some educational institutions or schools have leaders and teachers who are either computer illiterate or technologically ignorant. This might lead to the loss of interest in the teachers in the knowledge and the implementation of ICT. Teacher knowledge in ICT is in massive demand in the sense that teachers and learners will be able to cope with any situation that may arise because of unknown reasons and prepare the learners technologically for the 21<sup>st</sup> century. Knowledge of ICTs by teachers first and then by learners is vital to becoming the leaders in curriculum practice. However, teachers are everyday learners due to the changes in curriculum practice. Suggestions emerged that teachers' understanding and explicit aspects of knowledge strengthen their ability to contribute skilfully in the designation of work across situations and contexts, including the ability to design new, unfamiliar works (see 2.3.2). Due to the knowledge of ICTs by teachers in curriculum practice that will mean education, the school will not be the educational setting, and homes to be specific will also be the educational settings or even anywhere education will be in progress.



The recommendation is that researchers have to find out what can be done to address the poor infrastructure issue that led to poor connectivity in the use of ICTs so that teachers, even in rural schools, should have the knowledge of ICTs, which could be used in curriculum practice.

### **5.5.3.2 Teachers' knowledge of ICTs in curriculum practice**

Mishra and Koehler (2006) inform about TPCK as teachers' capacity of ICT integration through considering both the value and alignment of ICT tools with the content knowledge of a particular subject or curriculum objectives in general (Jogezai & Ismail, 2020:2).

Obielodan *et al.* (2020:63) argue that some teachers challenge educational expertise with poor knowledge on current implementations and the use of ICTs in their expert training. The researchers recapped that the success or failure of ICT implementation depends on how teachers perceive their knowledge in using ICT in curriculum practice. Ingole (2020:260) argues that ICT has increased the number of services in the field of education, as it now allows Distance Learning, Online Learning, Virtual Classrooms, MOOC (Massive Online Open Courses), MOODLE (Modified Object-Oriented Dynamic Learning Environment), Video-Audio Conferencing, E-Learning, Digital Library Learning, etc. All these have restructured the field of education.

It is already stated in the above paragraph (5.7.1) why teacher knowledge of ICTs is a challenge. In order to address the findings concerning teacher knowledge of ICTs in curriculum practice, teachers have to know different types of ICTs to understand which they have to choose and use efficiently for specific subjects. Moreover, ICT tools could be used to support critical thinking, creativeness, and state-of-the-art technologies, which are part of twenty-first-century learning (see 2.3.2.). ICT knowledge in curriculum practice can change teaching methods to be specific and learner methods of learning; hence, it could create active participation for both partners and embolden improvement of education (see 3.2.2). The findings revealed that a few teachers have knowledge of ICTs in curriculum practice. This was supported by Participants E and H when they said they know how to download from the websites and even cited the subjects where they used ICTs (see 4.4.2), and that knowledge was not enough

because there are ICT tools they did not know, which are supposed to be known and used (see 4.5.3.).

The recommendation is that researchers need to explore more knowledge of ICTs by teachers in curriculum practice; hence this is a critical concern because that knowledge is of vital importance currently for the twenty-first century.

### **5.5.3.3 *Implementation of ICTs in curriculum practice***

The use of ICT in the education sector adds value to the teaching methodology and learning parameters and improves learning effectiveness (Puri & Sharma, 2020:76).

Kadam (2020:178) argues that ICTs are the dominant tools for expanding educational prospects, either formal or non-formal, to different kinds of teachers enthusiastic about being knowledgeable and advanced with ICTs.

In order to respond to the challenges concerning the implementation of ICTs in curriculum practice, ICTs in education use should be the main worry, especially as from now going forward and in order to fill this gap, teachers should be technologically empowered and supported in the implementation of ICTs in curriculum practice by the ICT experts in all the countries, especially in rural schools (see 2.3.3). Teachers worldwide, specifically in rural areas, will be motivated in the knowledge and the implementation of ICTs in curriculum practice (see 3.2.2); hence lockdown caused by COVID-19 exists in all schools in the world. Therefore, many schools are moving to online learning. Teachers are teaching via social networks like WhatsApp or video calls. Even the meetings with the educational specialists are held online (see 4.4.2.2). Unfortunately, some teachers, especially in the rural schools, are still struggling in the implementation of ICTs, and this is enthused by participant B when she said she has no knowledge of the use of a laptop and she even leaves it at home when she goes to school (see 4.4.2.2).

The study's findings are that the South African Government should wake up and respond to the call of the COVID-19 issue that exposed the need for knowledge and the implementation of ICTs. Therefore the Government should ensure that the rural areas are taken care of as far as ICTs are concerned, and they should spend enough time on the thorough training of teachers in the knowledge and the implementation of

ICTs, predominantly in the poor rural schools who must be accommodated in any prevalence that may occur in future.

#### **5.5.3.4 Policy requirements concerning ICTs**

Gondwe (2020:118) argues that the researchers analysed teacher educators' use and knowledge of ICT, policy awareness, and policy content perceptions. This significance also highlighted the manifestation of policy through institutional practices.

The National Policy on ICT (2012) initiative focused on ICT use in school education to devise, catalyse, support and sustain ICT. It promotes the ICT enabled activities and processes to improve access, quality, and efficiency in the school system (Singh, Luthra, Mangla & Uniyal, 2019:48; Pandey & Pandey, 2020:861).

In response to the challenges of the policy requirements to ICTs international policy, there are concerns about the infrastructure issues to accommodate the rural schools (see 2.4). In the same paragraph, the South African policy emphasised the knowledge and implementation of ICTs in curriculum practice and overcoming the challenges that may be a stumbling block in enhancing education. The National ICT Policy White Paper intends to reduce inequalities in South Africa by 2030 and enhance education by sourcing out the ICTs and encouraging knowledge and implementation (see 2.4). ICT policy is crucial because it promotes the significance of ICT in education (see 4.7.6).

The study's findings were that the participants indicated that they wished to be included in the policy. However, the practical part of it is not fulfilled by the Government of the country, particularly in rural schools in the Eastern Cape and scholars witness that in their saying that in other parts, some of the South African schools are experiencing poverty that affects some schools in having no money to buy ICT tools. Henceforth some schools were categorised as 'No' fee schools, resulting in limited access to ICT and internet technology; therefore, rural schools teachers lack sufficient ICT knowledge (See 4.7.6).

## **5.6 RECOMMENDATIONS**

This segment covered the recommendations from the findings of the researcher. Teacher knowledge in ICTs, particularly in curriculum practice, is a neglected issue; in other words, it is not considered enough by some rural schools. The study discovered that some teachers are still struggling with ICT knowledge, especially in teaching and learning, affecting education. The research indicated that teacher knowledge of ICTs in curriculum practice is a serious issue that needs attention by all educational parties; hence, technology is fundamental currently. Furthermore, we face many critical issues these days that need the education to proceed no matter what. COVID-19, with its social distancing regulations, ICTs can take the lead because teaching and learning can take place all the time, even if schools are closed. This is a big task that needs all educational parties to work hand-in-hand for the knowledge of ICTs in curriculum practice and the knowledge needed to be acquired by teachers first because they are the curriculum drivers. Knowledge of ICTs can even result in the learner-centred approach, which can make learners learn independently using ICT knowledge, which is transferred to them by their teachers. With the knowledge of ICTs, curriculum practice could occur with or without the learner's presence in the class. The technology that learners already have in their possession is for personal usage, not for curriculum. However, technological knowledge is the base on which the ICT knowledge can be built. Educators should be able to adjust existing learning theories for the digital age while at the same time using the principles of connectivism to guide the development of effective learning materials (Shaqiri, 2020:15).

### **5.6.1 Recommendations for teachers**

We currently face the situation (the presence of the COVID-19 amongst us) and may demand urgent knowledge of ICTs in curriculum practice in the coming years. The work will not be too much from the teachers' side in transferring ICT knowledge to the learners because they have the knowledge base in the ICTs. Therefore, teachers will change that personal knowledge to enhance education to accommodate the curriculum practice. As mentioned in the previous chapters, teachers need to know the content of the subject to use the ICTs in that content; in other words, content knowledge is of significance. Therefore, the quality of learning and teacher skills

towards technology in learning today is essential (Nuraini *et al.*, 2020:110). Sarma (2020:1922) argues that teaching-learning in Assam during the pandemic period is a witness to the inexorable exertions of the teachers to make a paradigm shift to the virtual space to work together with students as an unconventional method of teaching, teachers as well as the learners, regardless of the discipline have to face, as well as tremendous challenges. The reality is that HEIs placed in the rural areas of Assam are not adept in using ICTs for teaching-learning purposes. However, the outbreak of COVID-19 has made the community of teachers and learners adapt to methods like online delivery of content and the creation of videos on preferred subjects for the learners.

Nguyen, Nguyen, Vo, Nguyen and Nguyen (2020:3) argue that the two most significant teacher communities on Facebook: Microsoft Innovative Education Expert Vietnam – MIE and Vietnam Innovative Education Forum – VIEF, which is impossible to reach other countries, all assist with the knowledge of ICTs, particularly in curriculum practice. Many teachers are familiar with Facebook, as was mentioned in the early chapters of the study, for instance. However, their knowledge is based on personal and fun purposes, which they can change use that social network for the curriculum practice. However, the network issue is because some teachers live in rural areas. The new educational platforms like Edmodo, Google Classroom, Quizlet, Wakelet for education, etc., are a range of didactic tools for online delivery of classes, such as quizzes, polls, video demonstration options, PowerPoint or group work, as well as formative evaluation (Shaqiri, 2020:16). Even WhatsApp, which is better known by all parties, including parents, can be used in curriculum practice. This could make it easier for the parents to support their children in schoolwork because some parents also know WhatsApp. Teachers can organise circuit groups where they can be trained by those who are better in technology or even ask someone from the community working in the internet café or anyone who has better ICT knowledge to volunteer work as their trainer. Professional development in the knowledge of ICTs in curriculum practice should be organised, but that arrangement is the responsibility of the education department from the province. ICT champs are to be identified in the groups, which should be done according to the ICT principal. Hence, ICT teacher knowledge in curriculum practice is an important issue. Therefore, teachers should work cooperatively with parents since they provide their kids with data and even the ICT

tools. Dhawan (2020:6) argues that an online approach is an uncomplicated and reachable approach that can be attained even by rural schools or teachers and learners.

### **5.6.2 Recommendation for the Eastern Cape Department of Education (ECDoE)**

The effectiveness of teacher knowledge of ICTs is mainly imperative nationally first and then in the province. The Standing Conference of the Ministers of Education and Cultural Affairs of the Lander (KMK [Standing Conference of the (State) Ministers for Education and Culture] 2017) recently published its strategy paper on 'education in the digital world', requiring schools to foster digital competences in their students across all subjects (König *et al.* 2020:610). The success in the teacher knowledge of ICTs is chiefly significant in the province since they are the ones that make decisions for every department, including education in the case of this study. Especially now when we are facing the COVID-19 tragedy to alert all the South African Province leaders to consider the knowledge of ICTs by teachers in particular. As the problem was highlighted in the study's research problem, there is a serious need for teacher knowledge of ICTs, particularly in curriculum practice. Therefore, it is the responsibility of the provincial leaders to provide support to the teachers of this province. Some schools, especially those in the townships and some rural schools, are at an advantage because some teachers know ICTs in curriculum practice. However, some are not, and the provincial leaders should consider that. The infrastructure, which is the main challenge in installing ICT tools, also needs to be well-thought-out by the leaders. Socioeconomic background is another issue that the provincial leaders need consideration because some schools and some communities are poor. ICT tools must be made available in all schools, respective of their locations.

### **5.6.3 Recommendation for the district education specialist**

It is the responsibility of the provincial leaders to inform the district officials of the significance of teacher knowledge of ICTs in curriculum practice. The district officials are expected to have the ICT knowledge to make inspection easy for them and so that they can facilitate teachers. They have to emphasise the knowledge and the use of

ICTs in every subject as all the schools are directed by the ICT policy. The school improvement plan drawn by each school could also make the work easier for the official, which needs to be reinforced in all schools. The current tragedy we see ourselves facing also clarifies to everyone that ICT knowledge, which needs perseverance by all teachers, is genuinely needed in all countries. Social networks, which are already used by many people, even the officials and teachers, need to be reinforced, hence even now, meetings are held virtually.

#### **5.6.4 Recommendation for policy improvement**

Policy developers from the national to the province need to resuscitate the ICT policy, and the district officials must make sure that the ICT policy is available in all schools. Policies must emphasise the significance of teacher knowledge of ICTs in curriculum practice, and it must not end there. Training teachers in the knowledge of ICTs should be emphasised, especially in the current era dominated by the COVID-19 calamity. Some schools have no ICT resources, which must be taken into consideration by the policy-makers. The policy-makers must also consider the enhancement or creation of infrastructures to accommodate all schools in technological learning. Employment of more teachers is necessary as many teachers are deceased due to the COVID-19 pandemic. As the researcher mentioned in the previous chapters, the shortage of teachers is one reason why teachers lack knowledge in ICTs, policy-makers must make sure that the policy is reorganised in all schools. A recommendation is that the researchers should encourage the South African government to create a policy that will fulfil the teachers' knowledge of ICTs in curriculum practice, particularly in the deep rural areas.

#### **5.7 VALUE OF THE STUDY**

Hove and Grobbelaar (2020:49) describe a value chain as a framework that explains a complete variety of endeavours that organisations (schools) and personnel (educational parties) accomplish to transform education and, in this case, to involve the knowledge and the implementation of ICTs as to advance curriculum practice. In the case of this study, firms are the schools where the teachers work dealing with

curriculum practice and other related issues. They further argue that the framework comprises funds, teacher recruitment and learner enrolment in the education sector, as its exercises refer to different school undertakings. Once learners are educated technologically, the school will have better skilled and empowered educators. Then the school will have efficient resources that will benefit even the community.



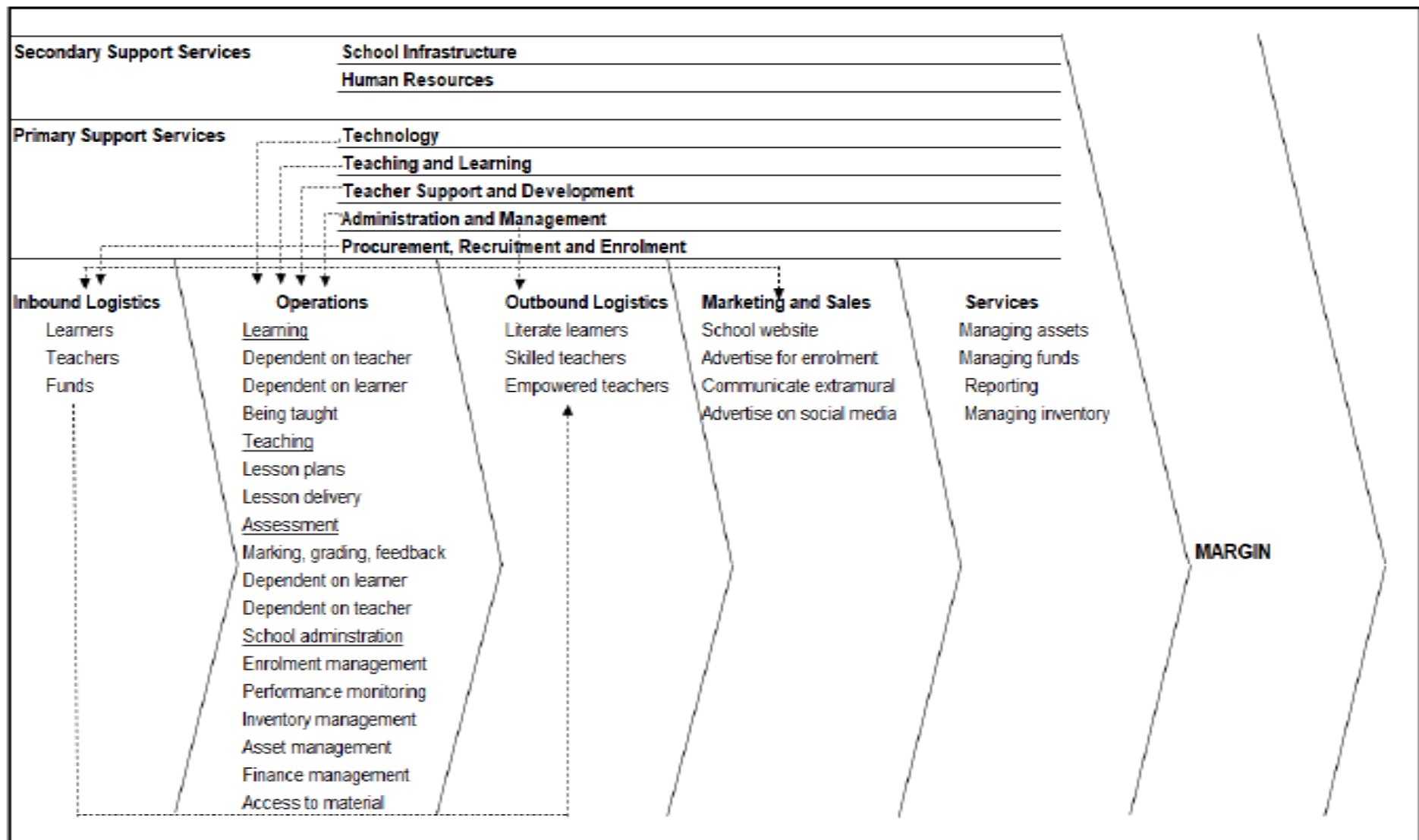


Figure 5.2: The primary education value chain framework

This study was intended to ascertain teacher knowledge in ICTs in curriculum practice, particularly in rural areas, to motivate teachers to use even the little knowledge they have in the implementation of ICTs in curriculum practice. TPACK as the framework of the study is as much concerned about improving innovative skills to find out and expose how ICT knowledge is put into practice. TPACK is the underpinning framework of knowledge to teach with technology with the knowledge of the technological concepts. This framework is also of value and motivational to the teachers who have no knowledge or little knowledge in ICTs in curriculum practice.

The study also provoked teachers in the knowledge of ICTs in curriculum practice. Even the departmental officials were encouraged in the teacher's support in the knowledge of ICTs. The South African Government is encouraged to develop infrastructure to accommodate even the teachers in the rural schools in the knowledge of ICTs by teachers first so that they have complete confidence before the learners.

## **5.8 SUGGESTIONS FOR FURTHER RESEARCH**

Further researchers must investigate the expected infrastructure for installing the ICT tools in the deep rural schools. They must also include the significance of the ICT knowledge by the officials and the parents; hence the researcher's focus was on teachers only, and officials and parents are the part of the education of learners. They must also pay attention to the significance of teacher training in ICTs. Further researchers must also find out what can be done to ensure that all schools are secure and have ICT tools.

## **5.9 LIMITATIONS OF THE STUDY**

According to the study, the researcher is concerned about the South African policy in education, which does not accommodate rural schools due to poor infrastructure. In contrast, in the same country, there are schools like in Cofimvaba, which are also in the same province in the rural areas and who are accommodated in the ICTs knowledge. The researcher is unsure about teacher knowledge of ICTs in curriculum practice in those schools; hence the data collected is from teachers of the nearby schools. The study was conducted in four schools out of many schools in the district;

therefore, the study's findings are not thorough. Data was collected from eight teachers out of so many district teachers; that is also not precise.

## **5.10 CONCLUSION**

The study's objective was to explore teacher knowledge of ICTs, particularly in curriculum practice. Semi-structured interviews were used as the research tool in this study. Eight teachers selected from four primary schools in the rural areas of the Chris Hani District were questioned during the collection of data. This study was guided by the TPACK theory of Glowatz *et al.* (2017). The theory was introduced to understand teacher knowledge and allow for the self-motivated nature of technology knowledge or ICT. It helps in the knowledge base teachers require in ICT, predominantly in curriculum practice.

Regarding the participants' responses, it was clear that teachers did not receive adequate support from the Department of Education. They only received the fundamentals on the knowledge of ICTs and their usage. Virtually all the participants did not know as many ICT tools as necessary; they only knew those they were conversant with and accessible to them. Teachers specified that they have interests in ICT knowledge in teaching and learning. However, due to unresolved conditions that hampered their interest, it made it difficult for them to apply their knowledge effectively using ICTs. Infrastructure was the leading complaint that is a challenge to all the participants since they are in the poor rural areas of the Eastern Cape Province.

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# APPENDICES

## APPENDIX A: ETHICS STATEMENT



### GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

02-Apr-2020

Dear Mrs Lobete-Tabata, Nomawabo N

#### Application Approved

Research Project Title:

**Exploring teacher knowledge of Information and Communication Technologies in Curriculum Practice**

Ethical Clearance number:

**UFS-HSD2019/0997/3103**

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

**Prof Derek Litthauer**

**Chairperson: General/Human Research Ethics Committee**

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Park West  
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South Africa

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Bloemfontein 9300  
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7619 / 3682  
[RIMS@UFS.ac.za](mailto:RIMS@UFS.ac.za)  
[www.ufs.ac.za](http://www.ufs.ac.za)



**APPENDIX B: REQUEST TO CONDUCT RESEARCH IN THE EASTERN CAPE  
DEPARTMENT OF EDUCATION**

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

Dear Sir / Madam

I am doing the research and I would like to request the permission to conduct my research in the Chris Hani District Schools.

**DATE: 27– 30 April 2020**

**TITLE OF THE RESEARCH:**

Exploring teacher knowledge in and the use of ICTs in Curriculum practice.

**PRINCIPAL INVESTIGATOR:**

Name: Nomawabo Lobete-Tabata

Student number: 2004096786

Contact number: 0823491725

Faculty: Curriculum Studies

Department: Education

**STUDY LEADER CONTACT**

Name of study leader: Dr MD Tshelane

Contact number: 0829708243

**AIM / PURPOSE OF THE STUDY**

To determine what ICT knowledge teachers have in curriculum practice.

To investigate teachers interest in ICTs particularly in curriculum practice.

To examine the policy requirements in relation to ICTs particularly in curriculum practice.

**WHO IS DOING THE RESEARCH?**

I Nomawabo Lobete Tabata is the one who is doing the research project. I am working for the education department. I am doing the research because it is of my

interest to find out the knowledge and the use of ICTs teachers have in curriculum practice hence they have been given computers by the Eastern Cape Province department of education.

### **WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?**

The participants will answer the questions about the knowledge and use of ICTs in curriculum practice. The study involves semi structured interviews and the following types of questions will be used:

1. What do you understand about the concept Information and Communication Technology (ICT)?
2. Do you use ICT tools for curriculum practice?
3. Which subjects do you use ICT in, most of the time?
4. In the school do you have an access to the ICT tools?
5. Which ICT tools do you have in the school?
6. Do you know how to use them especially for curriculum practice?
7. Do you have an interest in the use of the ICT tools particularly for curriculum practice? If yes/ no why do you have or not have an interest in the use of them?
8. What knowledge do you have with regard to the use of ICT generally?
9. What knowledge do you have with regard to the use of ICT in curriculum practice?
10. What challenges do you have with regard to the use of ICT especially in curriculum practice?
11. What do you expect to know about the use of ICT especially in curriculum practice?

15 minutes is allocated for each participants to answer the questions and the interviews will take 2 hours.

### **WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?**

The participants will gain more knowledge and reassurance on the use of ICTs in curriculum practice.

The participants' confidentiality and anonymity will be emphasised at the beginning of the interviews.

### **WHAT IS THE POTENTIAL RISKS TAKING PART IN THIS STUDY?**

There will be no risks for the participants involved in the study but the school police will be involved by the researcher.

### **WILL THE INFORMATION BE KEPT CONFIDENTIAL?**

The names of the participants will not be recorded anywhere and no one will be able to connect the participants to the answers they will give. The answers will be given a fictitious code number or a pseudonym and they will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. My supervisor will be the only the person who will have access to their names and their data. Their answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external coder, and members of the Research Ethics Committee. Otherwise, records that identify them will be available only to people working on the study, unless they give permission for other people to see the records.

### **HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?**

Hard copies of your answers will be stored by researcher for a period of five years in a locked cupboard for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. Hard copies will be put on fire and electronic information will be deleted or cleaned from the trash. There is no possibility of the participants to be discomfort because the participants are the colleagues of the researcher they know each other. For the risks that may occur of which that is impossible but the researcher will inform the school police for any risks that may happen.

### **WILL THERE BE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?**

Participation in this project is voluntary therefor there will be no payment or incentive and the researcher will clarify that to the participants.

# APPENDIX C: APPROVAL LETTER TO CONDUCT RESEARCH IN THE SCHOOLS OF THE CHRIS HANI DISTRICT IN THE EASTERN CAPE



Province of the  
**EASTERN CAPE**  
DEPARTMENT OF EDUCATION

## OFFICE OF THE DISTRICT DIRECTOR

Physical Address: The Homestead Building, 02 Lingopu Drive, LAURIE Cashwood Park, Queenstown; Postal Address: Private Bag X7053, QUEENSTOWN 5320, REPUBLIC OF SOUTH AFRICA, Contact no: 045 806 5700 / 053 418 8866 e-mail: [chisa.mcabo12@gmail.com](mailto:chisa.mcabo12@gmail.com)

### CHRIS HANI WEST DISTRICT

**TO :** Ms LOBETE-TABATA  
**FROM :** THE OFFICE OF THE DISTRICT DIRECTOR  
CHRIS HANI EDUCATION WEST  
KOMANI, 5320  
**DATE :** 02 MARCH 2020

#### PERMISSION TO CONDUCT RESEARCH

The above mentioned and our recent conversation has reference

ICT forms an integral part of the ECDOE and move so with the dawn of the Fourth Industrial Revolution. After thoroughly considering your request I came to the following conclusion.

You, Nomwabo Lobete-Tabata will be allowed to conduct your research in ICT in schools within the Chris Hani West District, provided that you:

- Share the outcome of your research with CHMED
- Your research must not negatively impact on the learning and teaching
- You arrange a meeting with the principals of the selected schools to arrange your sessions

I wish you all the best of luck with your research and may you have a positive outcome / result.

Thank you!

Yours in Education

  
\_\_\_\_\_  
NRWADE BRUYN  
DISTRICT DIRECTOR  
CHRIS HANI WEST DISTRICT

## APPENDIX D: LETTERS TO THE SCHOOL PRINCIPALS AND TEACHERS

### REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Dear Mr, Mrs/ Ms

I am doing the research and I would like to request the permission to conduct my research in your school.

**DATE: 27 – 30 April 2021**

**TITLE OF THE RESEARCH:**

Exploring teacher knowledge in and the use of ICTs in Curriculum practice.

**PRINCIPAL INVESTIGATOR:**

Name: Nomawabo Lobete-Tabata

Student number: 2004096786

Contact number: 0823491725

Faculty: Curriculum Studies

Department: Education

**STUDY LEADER CONTACT**

Name of study leader: Dr MD Tshelane

Contact number: 0829708243

**AIM / PURPOSE OF THE STUDY**

To determine what ICT knowledge teachers have in curriculum practice.

To investigate teachers interest in ICTs particularly in curriculum practice.

To examine the policy requirements in relation to ICTs particularly in curriculum practice.

**WHO IS DOING THE RESEARCH?**

I Nomawabo Lobete Tabata is the one who is doing the research project. I am working for the education department. I am doing the research because it is of my interest to find out the knowledge and the use of ICTs teachers have in curriculum practice hence they have been given computers by the Eastern Cape Province department of education.

## **WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?**

The participants will answer the questions about the knowledge and use of ICTs in curriculum practice. The study involves semi structured interviews and the following types of questions will be used:

1. What do you understand about the concept Information and Communication Technology (ICT)?
2. Do you use ICT tools for curriculum practice?
3. Which subjects do you use ICT in, most of the time?
4. In the school do you have an access to the ICT tools?
5. Which ICT tools do you have in the school?
6. Do you know how to use them especially for curriculum practice?
7. Do you have an interest in the use of the ICT tools particularly for curriculum practice? If yes/ no why do you have or not have an interest in the use of them?
8. What knowledge do you have with regard to the use of ICT generally?
9. What knowledge do you have with regard to the use of ICT in curriculum practice?
10. What challenges do you have with regard to the use of ICT especially in curriculum practice?
11. What do you expect to know about the use of ICT especially in curriculum practice?

15 minutes is allocated for each participants to answer the questions and the interviews will take 2 hours.

## **WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?**

The participants will gain more knowledge and reassurance on the use of ICTs in curriculum practice.

The participants' confidentiality and anonymity will be emphasised at the beginning of the interviews.

## **WHAT IS THE POTENTIAL RISKS TAKING PART IN THIS STUDY?**

There will be no risks for the participants involved in the study but the school police will be involved by the researcher.



### **WILL THE INFORMATION BE KEPT CONFIDENTIAL?**

The names of the participants will not be recorded anywhere and no one will be able to connect the participants to the answers they will give. The answers will be given a fictitious code number or a pseudonym and they will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. My supervisor will be the only the person who will have access to their names and their data. Their answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external coder, and members of the Research Ethics Committee. Otherwise, records that identify them will be available only to people working on the study, unless they give permission for other people to see the records.

### **HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?**

Hard copies of your answers will be stored by researcher for a period of five years in a locked cupboard for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. Hard copies will be put on fire and electronic information will be deleted or cleaned from the trash. There is no possibility of the participants to be discomfort because the participants are the colleagues of the researcher they know each other. For the risks that may occur of which that is impossible but the researcher will inform the school police for any risks that may happen.

### **WILL THERE BE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?**

Participation in this project is voluntary therefor there will be no payment or incentive and the researcher will clarify that to the participants.

## APPENDIX E: CONSENT FORMS FOR THE ADULT PARTICIPANTS



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: BULELWA MSOLA

Signature of Participant:  Date: 27 APRIL 2020

Full Name(s) of Researcher(s): NOMANABO LOBETE-TABATA

Signature of Researcher:  Date: 27/04/2020



Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

#### CONSENT TO PARTICIPATE IN THIS STUDY

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.


I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: NOLUTH SEAMAN

Signature of Participant:  Date: 30/04/2020

Full Name(s) of Researcher(s): NOMAWABO LOBETE-TABATA

Signature of Researcher:  Date: 30/04/2020



Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

**CONSENT TO PARTICIPATE IN THIS STUDY**

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




I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.


I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: PAULINAH DYANTSI

Signature of Participant:  Date: 30/04/2020

Full Name(s) of Researcher(s): NOMAWABO LOBETE-TAPATA

Signature of Researcher:  Date: 30/04/2020

Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

**CONSENT TO PARTICIPATE IN THIS STUDY**

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: LUNGISA MAFABENI - MLONJENI

Signature of Participant: x N. Mlonjeni Date: 29/04/2020

Full Name(s) of Researcher(s): NOMAWABO LOBETE STABATA

Signature of Researcher: [Signature] Date: 29/04/2020



Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

#### CONSENT TO PARTICIPATE IN THIS STUDY

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: NONDUMISO DIKO

Signature of Participant: x [Signature] Date: 29/04/2020

Full Name(s) of Researcher(s): NOMANABO LOBETE-TABATA

Signature of Researcher: [Signature] Date: 28/04/2020

Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

**CONSENT TO PARTICIPATE IN THIS STUDY**

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: DAMBISN KEKA - MPUKU

Signature of Participant: x LMPUKU Date: 28/04/2020

Full Name(s) of Researcher(s): NOMAWAJO JOBETE-TABATJA

Signature of Researcher: [Signature] Date: 28/04/2020



Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

**CONSENT TO PARTICIPATE IN THIS STUDY**

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: LAZOLA MPEKE

Signature of Participant: [Signature] Date: 28/04/2020

Full Name(s) of Researcher(s): NOMAWABO LOBETE TABATA

Signature of Researcher: [Signature] Date: 28/04/2020



Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

**CONSENT TO PARTICIPATE IN THIS STUDY**

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.


I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: SAKHUMZI SIGABI

Signature of Participant:  Date: 27/04/2020

Full Name(s) of Researcher(s): NOMAWABO LOBETE-TABATA

Signature of Researcher:  Date: 27/04/2020



Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

**CONSENT TO PARTICIPATE IN THIS STUDY**

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



Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

**Thank you for taking time to read this information sheet and for participating in this study.**

**CONSENT TO PARTICIPATE IN THIS STUDY**

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.


I agree to the recording of the *insert specific data collection method*.

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

Full Name of Participant: PAULINA DYANTSI

Signature of Participant:  Date: 30/04/2020

Full Name(s) of Researcher(s): NOMAWABO LABETE-TAPATA

Signature of Researcher:  Date: 30/04/2020





Nomawabo Lobete Tabata on 0823492517 or wabsjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tsholane MD on 0829708243 or TsholaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

Thank you for taking time to read this information sheet and for participating in this study.



Dirie/Ryland, Park West/Parkwes, Bloemfontein 9301, South Africa/Suid-Afrika  
P.O. Box/Poebus 339, Bloemfontein 9300, South Africa/Suid-Afrika. T: +27(0)51 401 9111. www.ufs.ac.za

**CONSENT TO PARTICIPATE IN THIS STUDY**

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



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the insert specific data collection method.

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

Full Name of Participant: BULELEWA MISOJA

Signature of Participant: [Signature] Date: 27 April 2020

Full Name(s) of Researcher(s): NOMAWABO LOBETE-TABATA

Signature of Researcher: [Signature] Date: 27/04/2020

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Nomawabo Lobete Tabata on 0823492517 or wabstessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@ufs.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

Thank you for taking time to read this information sheet and for participating in this study.

CONSENT TO PARTICIPATE IN THIS STUDY

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

205 Nelson Mandela Drive/Rydan, Park West/Parkwes, Bloemfontein 9301, South Africa/Suid-Afrika P.O. Box/Postbus 539, Bloemfontein 9300, South Africa/Suid-Afrika, T: +27(0)51 401 9111, www.ufs.ac.za



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the insert specific data collection method.

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

Full Name of Participant: SAKHUMZI SIGABU

Signature of Participant: [Signature] Date: 27/04/2020

Full Name(s) of Researcher(s): NOMAWABO LOBETE-TABATA

Signature of Researcher: [Signature] Date: 27/04/2020

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Nomawabo Lobete Tabata on 0823492517 or wabjessica@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr Tshelane MD on 0829708243 or TshelaneMD@uwc.ac.za. There will be no harm or discomfort to the participants but in any case the school police will be informed about the project.

Thank you for taking time to read this information sheet and for participating in this study.



I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the insert specific data collection method.

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

Full Name of Participant: DIMBISH KHEZA - MPOKU

Signature of Participant: [Signature] Date: 22/04/2022

Full Name(s) of Researcher(s): NOMAWABO LOBETE-TABATA

Signature of Researcher: [Signature] Date: 28/04/2022



CONSENT TO PARTICIPATE IN THIS STUDY

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



## APPENDIX F: LETTER FOR LANGUAGE EDITING

**Michelle Woolley**

WRITER EDITOR PROOFREADER TRANSLATOR

Bachelor of Library and Information Science: B.Bibl.  
Reference & Research Librarian

Associate Member of Professional EDITORS' Guild (PEG)

### **CERTIFICATE OF EDITING**

This letter certifies that I have edited the Dissertation detailed below.

Title:

Exploring teachers' knowledge in ICT in curriculum practice

Author:

Nomawabo Lobete Tabata  
2004096786

Regards  
Michelle Woolley




Date: 29/03/2021

michellewoolley12@gmail.com  
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## APPENDIX G: TURN IT IN RECEIPT AND REPORT



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**ABSTRACT**

Minister (2020). It argues that currently some teachers have less knowledge of the knowledge of all in the knowledge of ICTs particularly in rural areas and that affect the enhancement of teaching and learning particularly in the rural schools. The South African government progressively in the Eastern Cape Province have taken the high investment of improving education over in the rural schools by providing the teachers of that province with the professional tools like the laptop and tablets that could assist teachers in the conveying of education. Because education is so important and that was accompanied by the state provided no obstacles that every child is eligible to free education and that achieve the sentiment of the South African people who are working for the different companies by donating with laptops for children in some schools of that province as to improve education. Because teachers who are successfully engaged with the above-mentioned devices therefore as the conductor of the class have gained from this province. It is of my interest on the aim of the study is to examine teachers' knowledge of ICTs in curriculum practice specifically in the rural schools of which that is the title of this study. This study will make use of four schools from the rural schools with slight education as the participants. (Dube & Mkhize (2020: 38) argue that the study findings have revealed positive teachers' perceptions towards ICT integration in teaching and learning hence some do have knowledge and skills for using different ICT tools including mobile computers.

## CURRICULUM PRACTICE IN THE RURAL SCHOOLS

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