

# COVER PAGE



**School managers' Perceptions on the Use of Technological Resources in Curriculum  
Supervision in the context of COVID-19**

**By**

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**Submitted: December 2023**

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## **ABSTRACT**

This dissertation presents a qualitative case study of sixteen school managers specifically school principals. This study was conducted with the main purpose of exploring the school managers' perceptions on the use of technological resources in curriculum supervision in the context of COVID-19 in the Zululand District. Furthermore, the study employed an interpretive paradigm. In addition, this paradigm has been utilised because the study aims at exploring the three missing levels of perception (knowledge, skill, and attitude) during curriculum supervision. The study sought to understand why school managers resist to use EdTech (educational technological) resources to supervise curriculum. In addition, an interpretive paradigm and case study were used on sixteen participants to gain the meaning in real situation. Subsequently, reflective activity, one-on-one semi-structured interviews, and focus groups were used to generate data. Moreover, the study used non-probability sampling methods, comprising purposive and convenient sampling. This study was framed by the by the curricular spider web (Van den Akker et al., 2010). Further to this, the theory that shapes this study is technological pedagogical content knowledge (TPACK). Data were analysed using guided analysis, which employed both deductive and inductive methods. Finally, ethical considerations related to qualitative research were explored such as trustworthiness, confirmability, dependability, transferability, and credibility. The findings of the study reveal that school managers were driven by knowledge perception to supervise curriculum when using EdTech supervision aids. The school managers could indicate the lack of technological resources and knowledge in schools. Even though there is a policy in place, some school managers are non-compliant with that policy. The study recommends the Department of Basic Education to install Wi-Fi in all schools to enforce the policy implementation. Moreover, the study further recommends that curriculum developers work alongside information and communication technologies (ICT) team specialists to advocate paperless curriculum supervision, train, and enhance school managers on software and ideological-ware EdTech supervision aids.

**Keywords: perception, supervision, curriculum, resources, technology, interpretivism paradigm, theoretical framework.**

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# CHAPTER ONE

## **Introduction**

The major purpose of this chapter is to provide a clear and logical structure to my study. This chapter reveals all key areas and provides information on the study. It further provides the direction the study is taking and making this clear in the reader's mind from the beginning. Furthermore, key areas like the title, purpose, location, rationale, problem statement, research questions, and objectives of the study are outlined. Moreover, a brief outline of the reviewed literature is given and how the issue of a gap in knowledge, has been addressed by the study. Further to this, the abridged research design and methodology are outlined. It further addresses the following aspects: qualitative approach, paradigm, style, sampling, data-generating methods, data analysis, trustworthiness, and the limitations of the study.

## **Background to the Study**

The mode of curriculum supervision has changed drastically in the past few decades with a large development given the introduction of technology in schools and society. In previous decades, school managers typically used only paper and pen for curriculum supervision and delivery. Moreover, Chai et al. (2019) outlines that to provide school managers with a learning environment that supports 21<sup>st</sup>-century pedagogies they need relevant perceptions that can expand access to knowledge and skills regarding the use of technology. In addition, Kozma and Isaacs (2011) declare that educational technology policy as it relates to capacity building, particularly among teachers, in order to maintain the economic competitiveness of the country, should develop lifelong learning as a national culture, and extend learning beyond schools to all life stages, especially among school supervisors. This suggests that educational technology policies should aim to equip curriculum supervisors and school managers with educational skills on curriculum supervision so that there is a positive change in the perception of the use of such technology. Furthermore, the study conducted by Jhurree (2005) in Mauritius indicates that in developed or advanced countries such as the United States of America (USA) or the United Kingdom (UK), technology in education offers an enhanced learning environment for school managers to supervise or manage the curriculum. In other words, technology is a powerful tool to supplement the instructions of school managers in schools and is taken as an

administrative tool for school managers to increase access to education and inclusive education practices in schools.

According to Mhlanga and Moloji (2020), COVID-19 is name for a novel coronavirus that was first identified in China, at the end of 2019. Before the outbreak of the COVID-19 pandemic, the world was mired in a learning crisis, evidenced by high levels of learning poverty (Fernandes, 2020). The spread of COVID-19 resulted in several disruptions to normal life and necessitated more than 160 countries to effect temporary closure of schools, leaving 1.6 billion children and youth out of school. In South Africa, the government was forced to enact a national lockdown, which meant the closure of all schools and tertiary education institutes (Mhlanga & Moloji, 2020). This has caused a process of curriculum supervision to a halt. There is concern that the widespread school closures led not only to a loss of learning but also the loss of human capital and diminished economic opportunities. Across the world, governments employed mitigation measures, such as utilising technology for remote learning to manage and cope with the crisis. Yamey et al. (2020) stress that it is worth noting that all COVID-19 interventions need to be adapted to the country context, the remote curriculum supervision employed by countries varies widely depending on levels of access to devices and connectivity.

### **Problem Statement**

The closure of schools in more than 160 countries while perceived as a preventive measure against the spread of COVID-19, has immeasurably affected the global educational system (Soper et al., 2021). The use of technological resources to supervise the curriculum has been considered the most appropriate alternative (Usman, 2016). Furthermore, Shrestha et al. (2021) assert that in many schools during<sup>1</sup> the COVID-19 pandemic several advantages to the need to shift to online supervision of the curriculum have been acknowledged, among these the opportunity for rapid progress in the field of digital education that, in other circumstances, would take years to complete. Moreover, the transition to the online supervision approach has also been assessed as a good opportunity for school managers to become more creative (Duraku & Hoxha, 2020).

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The process of transition from face-to-face to an online approach has already become common among schools worldwide and has affected curriculum supervision by school managers (Zikri et al., 2021). Some school managers indicated an unwillingness to supervise curriculum using technological resources due to a lack of technological resources and internet access, inadequacy of the technological formats/devices to supervise curriculum, as well as the lack of skill in and knowledge of the use of such resources (Kemi & Chijioke, 2021). In addition, the demand to shift curriculum supervision to the online approach has been reported to have increased the level of stress and anxiety of school managers in different parts of the world (Duraku & Hoxha, 2020). Moreover, the eruption of COVID-19 saw education system-wide closure of schools, prompting concerns that existing household and institutional inequalities could deepen during this period (Graham, 2022; Vigevano & Mattei, 2023).

### **Rationale or Brief Motivation**

As the principal of a school, I work with colleagues in school management teams (SMT) comprised of school managers in the school and from neighbouring schools. I also serve as a promotion and progression committee member in Mahlombe ward. I have noticed that in the context of COVID-19 school managers seem to struggle with and are reluctant to adapt to the use of technological resources in supervising the curriculum. As such, they would complain when they are supposed to attend online or virtual capacity-building workshops and meetings. In contrast, some school principals perceive the use of technology in the same context differently because they are coping and able to attend online meetings. This motivated me to propose this research project to explore school managers' perceptions on the use of technology in the context of COVID-19.

The studies conducted by Beul-Leusmann et al. (2014) and Pedersen (2010) on assessing and exploring the perceptions of school managers on the use of technological resources in schools across Finland outlined essential findings. The study found that school managers had knowledge perception of the use of technology. This suggests that school managers had been trained, qualified, and equipped with basic technology skills in the use of technological resources like desktop computers, laptops, and others to help with their planning and curriculum supervision. In the South African context, the study conducted by Molise and Dube (2020) on online curriculum supervision during COVID-19 in South Africa school managers experienced the unavailability of a network in rural areas. Further to this, it was found that

internet cafes were closed during the lockdown regulations because most school managers relied on these for their online submission and supervision. These factors greatly influenced the skill perception of using technological resources to supervise curriculum particularly in the context of COVID-19. In other words, school managers were driven by the societal ideas of colleagues, friends, and others. Moreover, at times, this may cause reluctance and ignorance regarding the use of technological resources to supervise curriculum.

In complicating the above discourse, Orlando et al. (2020) concur with Strzelecki and Rizun (2020) that few studies advocate for attitude perception which seeks school principals to be driven by self-identity in order to address their technology needs, particularly, in the context of COVID-19. Attitude perception seeks principals to draw from certain theories/methods/ideological ware when using technology (Ricciardi et al., 2012). Further to this, the study conducted by Pierce and Ball (2009), in connection with the perceptions that may affect the intentions of school managers to use technology to supervise the curriculum, revealed that those who are willing to use technological resources to supervise the curriculum are required to be prepared to shift their paradigm and make a commitment to learning to use the technology in an effective manner in order to supervise the curriculum well. Thus, this study seeks to observe the attitude perception of school managers in order to supervise the curriculum effectively through the use of technological resources.

The above literature suggests that curriculum supervisors are driven by different perceptions on the use of technology when supervising the curriculum in the context of COVID-19. As such, some draw from knowledge perception and skill perception while others draw from attitude perception. According to Mpungose (2017), the varying use of perception in the use of technology creates challenges in the supervision of curriculum. Moreover, studies have been conducted on the comprehensive or balanced use of perceptions on the use of technology when supervising the curriculum (Mukhari, 2016). This suggests that there is a need for the study to explore the perceptions of school managers on the use of technological resources in the supervision of curriculum. Consequently, this study aims to bridge the gap where school managers rely on one level of perception at the expense of other levels of perception by introducing a balanced perception where school managers will supervise curriculum using these levels in a balanced way.

## **Significance of the Study**

This study may contribute to the body of knowledge by providing insights into how school managers supervise the curriculum using technological resources. This study may help by educating teachers on the best application in their classrooms. Moreover, this study may equip and empower teachers and school managers by enabling them to adopt online teaching and curriculum supervision. This study may also assist learners to self-assess themselves using technological resources. This could enable both teachers and learners to migrate from being the consumers of information to being producers and disseminators of information. As a result, teachers and department of education administrators may benefit by being technologically fluent.

## **Main Purpose of the Study**

The purpose of this study is to explore the perceptions of school managers on the use of technological resources to supervise the curriculum in the context of COVID-19 in the Zululand district.

## **Research Questions**

1. What are school managers' perceptions of the use of technological resources to supervise the curriculum?
2. How do school managers perceive the use of technological resources when supervising curriculum?
3. Why do school managers perceive the use of technological resources when supervising curriculum in the manner that they do?

## **Research Objectives**

1. To understand school managers' perceptions of the use of technological resources to supervise the curriculum.
2. To find out whether school managers feel well equipped to use technological resources to supervise curriculum.
3. To determine the challenges perceived by school managers when using technological resources to supervise curriculum.

## Location of the Study

The study was conducted in KwaZulu-Natal under the Zululand District Office. Moreover, the Zululand District Office comprises the five Circuit Management Centres (CMC) (Nongoma CMC, Pongolo CMC, Paulpietersburg CMC, Bhhekuzulu (Abaqulusi) CMC and Mahlabathini CMC) in deep rural areas. Likewise, the Zululand District Office covers a population of 892310 with 8894 teachers and 763 schools.



Figure 1.1 map of Zululand District municipality

## Review of the Literature

### Phenomenon (Perceptions)

Perceptions can be viewed as an understanding of the world as constructed from information obtained through the senses (Baloyi & Beyers, 2020; Gregory et al., 2015). Perception is part of that personal dimension that makes people see situations differently as well as shaping their posture in terms of their environments. It is one of the most vital elements in understanding individual differences between people because how someone perceives a situation determines how they behave (Anshori, 2020). Recent studies by Nhlanzi (2018) and Nene (2019) indicate that school managers should perceive the use of technology to supervise curriculum through three frameworks: knowledge perception, which requires school managers to be driven by written documents and profession; skill perception, which requires school managers be driven by societal ideas from colleagues, friends, and others; and attitude perception, which requires school managers to draw on certain theories/ideological-ware when using technological resources to supervise the curriculum (Mpungose, 2017; Mpungose & Khoza, 2020). Thus, school managers should seek to read the written policy documents (knowledge perception), consult their colleagues (skill perception), and also draw from their self-identity (attitude perception) in order to use technology when supervising curriculum. However, the varying use of these perceptions (knowledge, skill, and attitude) in curriculum supervision creates vulnerable conditions in the field of education (Mwaniki et al., 2017). Consequently, little research has been done on the comprehensive use of these perceptions (Chigudu, 2016). This study intends to explore the perceptions of school managers on the use of technological resources to supervise curriculum, and to develop a framework that will balance the use of such perceptions.

### **Curriculum Supervision**

Curriculum supervision is an activity allocated to SMTs that prepares and enables individuals to superintend instructional and support personnel at the school building, facility, or staff level. It includes instruction in the principles of staffing, organization, and the management of learning activity, personnel relations, and administrative duties related to departmental unit/management and the specific applications to various educational settings and curricula (Jonyo & Jonyo, 2019). Moreover, curriculum supervision therefore involves observation of teaching and learning, assisting teachers in their professional development, both in individual and group context, evaluation of teachers, research and revision of the curriculum (Kasman & Lubis, 2022). In addition, most post-modernists have criticised the models of supervision as being rigid, classified and authoritarian. Furthermore, supervision represses instructors'

independence, and it is hypothesised that rational-technical supervision formations reduce effectiveness to routines, transforming supervisors into dominating figures with the capacity to diagnose teachers' pedagogical shortcomings and prescribe solutions (Ansell, 2023). Moreover, Matias (2023) on the other hand, complements competent supervision and ensures that instructors, including teachers, curriculum specialists, and supervisors, will work together to improve teaching. Further to this, Hill (2021) advances that curriculum supervision, is a method of teaching the staff to act in a more cognizant way. Moreover, Avizhgan et al. (2022) further assert that its goal is to provide curriculum implementors and supervisors with more information and unfathomable insights into what is happening around them. As a result, instructors/school managers have more alternatives for working with teachers to encourage effective collaboration between curriculum managers and supervisors, as teachers learn to recognise and overcome their difficulties. Subsequently, school managers get new perspective about what happens in different classroom environments. In addition, Ogunode et al. (2023) declare that supportive supervision is a learning situation for both teachers and their school managers.

In addition, Adeoye (2023) asserts that the purpose of school supervision is the promotion of development of favourable setting or teaching and learning process which eventually leads to the improvement of society. Furthermore, the aim is to improve the overall efficiency and raise the academic standards of the institution. Specifically, the purpose of school instruction supervision is to help teachers to learn what their problems are and seek the best methods of solving them regardless they are individual or group problems (Sukmara et al., 2023). Similarly, Adeoye (2023) suggested that school managers should guide teachers to improve teaching methods and techniques, utilise newly discovered principles of group dynamics, provide for individual differences, locate and utilise community resources and evaluate their teaching competence. According to Badiali (2020) , the goal of supervision may be divided into different categories as: teacher improvement which is focused on ensuring that school managers do their duties efficiently, ensuring that new teachers receive training so they can perform effectively on the job, providing teachers with specialised knowledge, assisting teachers in finding the sources of their lesson plans, offering technical support when needed, ensuring that discipline is upheld, keeping teachers' morale high, and offering suggestions for ways to enhance teacher' performance, and offering chances to identify teachers with unique skills and traits. Thus, Adams (2023) states that according to policy on the South African

standards for principalship school managers are expected to record, manage and support the best quality teaching and learning.

Furthermore, Govender and Khoza (2017) assert that the government has acknowledged the power of digital devices and supports the incorporation of technology in schools. Latter studies, explicate technology as a principal term which refers to broader technical resources and tools. Technology as a stand-alone concept focuses on tools such as computers and overhead projectors as well as resources such as the internet and audio-visual material (Oti-Boadi et al., 2014). Likewise, Gumbo (2018) declares that curriculum supervision through technological resources (online) utilizes important tools and/or applications which are especially relevant in the context of COVID-19 and enables the supervision of curriculum by school managers in open and distance contexts. The latter study further asserts that the school manager-teacher working relationship presents a human aspect that should take precedence over technology and thus guide how technology can be used in curriculum supervision. In other words, school managers should draw from the skill perception when using technological resources (such as smartphones, and available social media applications) to supervise the curriculum by consulting technology experts to guide or capacitate teachers on how to use them.

Further to this, Maringa (2016) asserts that Facebook can assist school managers to supervise the curriculum, provided it is well managed and implemented. Moreover, Steculorum et al. (2016) and Gleason and Von Gillern (2018) argue that Facebook, as a social network, assists school managers with staying connected to their school colleagues/friends because school managers socially support each other, especially on curriculum supervision. This suggests that school managers are influenced by the skill perception to supervise curriculum using technological resources. In other words, in Facebook groups, school managers can share various strategies such as videos, discussions about curriculum supervision topics, and the usage of approaches that are most successful and lead to an increased motivation and stimulate collaboration supervision amongst the SMs and information sharing.

### **Theoretical Framework**

Theoretical framework is defined as the building of ideas that have been translated into detailed measurement criteria and tested using established rigorous methods (Zuma, 2019b). Moreover, a theory is utilised to explain, understand, and predict phenomena to challenge existing human

knowledge. This challenge is based on structured support (Guntur, 2019). This study adopted Technological Pedagogical and Content Knowledge (TPACK) as a theoretical framework. TPACK is a term increasingly used to describe what teachers need to know to effectively integrate technology into their teaching practice. TPACK was introduced to the educational research field as a theoretical framework for understanding teacher knowledge required for effective technology integration (Mishra & Koehler, 2006). The latter study further reveals that the TPACK framework was built on Shulman's construct of Pedagogical Content Knowledge (PCK) which is concerned with how the school managers effectively use the appropriate resources to supervise the curriculum. Further to this, Mishra and Koehler (2006) aver that TPACK focuses on teachers' knowledge, such as Technology knowledge (TK) which is informed by various technologies such as learning management systems, social media sites, and others to supervise the curriculum using technological resources. Content Knowledge (CK) is knowledge about actual subject matter that is learned or taught which enables the SMs to supervise the curriculum (Mishra & Koehler, 2006). Pedagogical knowledge refers to the methods, processes, and knowledge of curriculum supervision (Mishra & Koehler, 2006). These are the core knowledge concepts that guided this theoretical framework. This theoretical framework also looked at Technological Content Knowledge (TCK) which addresses how technology can create new representation for specific content, and technological pedagogical knowledge which indicates knowledge of how various technologies can be used in curriculum supervision, and how using technology may change the way in which school managers supervise the curriculum. TPACK refers to the knowledge required by SMs for integrating technology into their supervision of any content area.

### **Research Design and Approach**

Maree (2013) avers that qualitative research is based on a naturalistic approach that seeks to understand phenomena in real-life situations. Hence, the study employed a qualitative research approach that facilitated the production of in-depth and rich data. Cresswell (2013) advocates the use of a qualitative research approach as it allows the researcher to engage intensively with participants by means of face-to-face interactions. Furthermore, the qualitative research approach produces a thick (detailed) description of participants' feelings, opinions, perceptions, and experiences and interprets the meanings of their actions (Rahman, 2020). Moreover, Ndoziya (2014) outlines the strength of a qualitative approach in that it provides an in-depth, intricate, and detailed understanding of meanings, actions, non-observable as well as

observable phenomena, attitudes, intentions, and behaviours. These are well served by naturalistic enquiry. The rationale for choosing this approach is to explore the perceptions (non-observable phenomena) of the perceptions of school managers on the use of technological resources to supervise the curriculum. However, Bernstein et al. (2018) state the weaknesses of the qualitative approach such that it produces findings which are not arrived at by statistical procedures or other means of quantification. I overcame this weakness by using guided analysis to analyse data generated from the participants because Padgett (2016), as well as Creswell (2017), outline that the qualitative approach is interested in analysing subjective meaning. Thus, the qualitative approach helped me to produce a thick (detailed) description of participants' feelings, opinions, and perceptions and interpreted the meanings of their actions when using technology to supervise the curriculum.

### **Research Paradigm**

Cohen et al. (2011) asserts that for any research to be undertaken, a study must outline the paradigm underpinning it. In addition, Avenier and Thomas (2015) define a paradigm as a set of assumptions or beliefs about fundamental aspects of reality, which gives rise to a particular worldview. This description is in line with Parker-Jenkins (2018) that a paradigm is a way of looking at or researching phenomena, a world view, a view of what counts as accepted or correct scientific knowledge or a way of working, an accepted model or pattern. This suggests that a paradigm is a determined avenue or a worldview used to generate and interpret findings. Moreover, Antwi and Hamza (2015) assert that the interpretive paradigm looks for culturally and historically obtained interpretations based on individuals' social lives and perceptions. Furthermore, Lincoln and Guba (1985a) declare that the most valuable aspects entailed in this paradigm are ontology and epistemology. Ontology assumptions address the questions of the nature and form of reality, or what there is that can be known. Chamberlain (2015) states that epistemology is a method of understanding and clarifying how we know what we know to be true. As a result, ontologically, this study employed the interpretive paradigm to reveal the subjective ideas and perceptions of school managers on the use of technological resources to supervise the curriculum with the understanding that individual school managers have different perceptions. In addition, epistemologically, the study employed the interpretive paradigm to produce knowledge through exploring and understanding the social world of SMs when they supervise curriculum using technological resources, as suggested by Al-Saadi (2014). However, one of the weaknesses of the interpretive paradigm is that the ontological view tends

to be more subjective than objective (Rahman, 2017). Thus, the findings of the study may draw from the researcher's beliefs and biases (Kivunja & Kuyini, 2017). In this study, this was clearly addressed by describing data, the process of data analysis, and how I reached my conclusions (Bertram et al., 2018). Kivunja and Kuyini (2017) assert that one of the strengths of an interpretive paradigm is that by using diversified views to explore the phenomenon, the researcher is not limited to describing objects, events or humans; instead, they are able to deeply understand them in a social context. Similarly, in this study, the interpretive paradigm helped to not only describe the perceptions of the school managers when supervising the curriculum using technological resources, but it also offered an insight into what informs their perceptions. This was done through Zoom interviews and an emailed reflective activity.

### **Research Style (Case Study)**

This study adopted the case study research style. Yin (2017) defines a case study as a single instance of a bounded system. Further to this, Heale and Twycross (2018) concur with Ormston et al. (2014) that a case study allows the exploration and understanding of complex issues such as perceptions. (instrumental, intrinsic, and collective). Furthermore, this study chose to employ an instrumental case study methodology because I wanted to gain an in-depth understanding of school managers perceptions of the use of technological resources to supervise the curriculum. Wellington (2015) declares the strengths of the case study as being illustrative and illuminating, accessible, and easily disseminated. A case study holds the reader's attention with vivid accounts that are grounded in reality. The latter study affirms the limitation of a case study as being that it is not replicable, and may not be representative, typical, or generalisable. Likewise, Harris (2015) notes difficulties in choosing, knowing, and setting boundaries to the case study, as well as gaining access to the case study settings and ensuring, where relevant, that case studies move beyond description to analysis and evaluation. I chose the case study of sixteen (16) school managers from different schools within a radius of fifty (50) to sixty (60) kilometres because it lowered costs and allowed for easy access. This might hold readers' attention since school managers bring vivid accounts of their perception of curriculum supervision as shaped by their real experiences. Thus, the case study was appropriate for this study because the findings were not anticipated to be generalised since the population sample was too small. In addition, I ensured that I used the appropriate data generation methods to guarantee the study was a success.

## **Data Generation**

The study adopted three techniques for data generation/production: zoom one-on-one semi-structured interviews, zoom focus group interviews, and a reflective activity (through email). Each participant was given one (1) gigabyte of data to ensure network connection during the process.

### **Emailed reflective activity**

According to Zuma (2019), a reflective activity is an open-ended question that allows the respondent to use their own words to answer. Thus, I emailed participants open-ended questions for the reflective activity. The questions were sent via e-mail and the respondents were also requested to send their responses by e-mail. Furthermore, questions were constructed with the guidance of the TPACK framework. The benefit of open-ended questions is that the participants can respond as much and in any way they may wish to. Moreover, open-ended questions are suitable for exploring complex issues for which simple responses cannot be provided (Cohen et al., 2011). Weaknesses of the reflective activity with open-ended questions include that the respondent may overlook instructions and be preoccupied with the demand to write. Further to this, completing a reflective questionnaire takes more time than just placing a tick in rating-scale boxes (Zuma, 2019). To overcome this challenge, I gave participants three (3) days to complete their questionnaires. I also reminded them via e-mail to avoid time wastage. The following questions were asked: 1. Which educational technological (edtech) resources do you use to supervise curriculum? 2. Why do use edtech resources to supervise curriculum? 3. What content of curriculum are you supervising using edtech resources? 4. How do you use edtech resources to supervise curriculum, in terms of financial, cultural, and physical access? 5. Towards which goals are you using edtech resources to supervise curriculum? 6. What activities are facilitated using edtech resources for curriculum supervision? 7. What roles do you play in the use of edtech resources when supervising curriculum? 8. Where do you use edtech resources to supervise curriculum? (location/environment) 9. When do you use edtech resources to supervise curriculum? 10. How do you assess/evaluate the effectiveness of the use of edtech resources to supervise curriculum?

### **Zoom one-on-one semi-structured interview**

According to Bruhjell (2016), Zoom one-on-one semi-structured interviews are viewed as the appropriate data generation method for this study because they provided participants the freedom to seek clarity when the need arose. Further to this, Zoom semi-structured interviews empower the participants, allow free interaction between interviewer and interviewee, allow opportunities for clarification so that relevant data is captured, and offer the researcher access to people's ideas, thoughts, and memories as conveyed in their own words, rather than in the words of the researcher, so as to maximise descriptions and discovery. However, Hofisi et al. (2014) argue that Zoom one-on-one interviews offer the possibility of modifying responses and investigating underlying responses. Thus, I was friendly, approachable, and created a welcoming and relaxing climate during the interview process. Moreover, I encouraged school managers to be open and drive the discussion/interview towards their perceptions of curriculum supervision using technological resources. The questions were pre-planned in order to save time. The connection link was sent to participants and each session took thirty (30) to thirty-five (35) minutes per participant after working hours (between 16h00 and 17h00). The following questions were asked: 1. Which educational technological (edtech) resources do you use to supervise curriculum? 2. Why do use edtech resources to supervise curriculum? 3. What content of curriculum are you supervising using edtech resources? 4. How do you use edtech resources to supervise curriculum, in terms of financial, cultural, and physical access? 5. Towards which goals are you using edtech resources to supervise curriculum? 6. What activities are facilitated using edtech resources for curriculum supervision? 7. What roles do you play in the use of edtech resources when supervising curriculum? 8. Where do you use edtech resources to supervise curriculum? (location/environment) 9. When do you use edtech resources to supervise curriculum? 10. How do you assess/evaluate the effectiveness of the use of edtech resources to supervise curriculum?

### **Zoom focus group interview**

Maree (2013) concurs with du Plessis and Van Niekerk (2014) when describing a Zoom focus group as a strategy based on the assumptions that group interaction will be productive in widening the range of responses, activating forgotten details of perceptions, and releasing inhibitions that may otherwise discourage participants from disclosing information. I organised a meeting for the school managers at a time that was convenient to all and then I informed them

about my study and its rationale. I asked and encouraged them to participate fully during the Zoom focus group interview. I also made them aware that discussions were not subject to judgment and would remain confidential. The following appropriate sampling strategies were necessary for this study. The following questions were asked: 1. Which educational technological (edtech) resources do you use to supervise curriculum? 2. Why do use edtech resources to supervise curriculum? 3. What content of curriculum are you supervising using edtech resources? 4. How do you use edtech resources to supervise curriculum, in terms of financial, cultural, and physical access? 5. Towards which goals are you using edtech resources to supervise curriculum? 6. What activities are facilitated using edtech resources for curriculum supervision? 7. What roles do you play in the use of edtech resources when supervising curriculum? 8. Where do you use edtech resources to supervise curriculum? (location/environment) 9. When do you use edtech resources to supervise curriculum? 10. How do you assess/evaluate the effectiveness of the use of edtech resources to supervise curriculum?

## **Sampling**

Benestan et al. (2015) define sampling as the process used to select a portion of the population for study. Silverman categorises non-probability sampling into two groups namely, purposive and convenience sampling. The latter study defines purposive sampling as participants selected because of a defining characteristic that makes them the holders of data needed for the study, whereas convenience sampling is when the population elements are selected based on facts that are easily and conveniently available. Likewise, Silverman (2015) identifies the strengths of convenience sampling as being fast and inexpensive but argues that the strategy does not result in representative samples. This study employed both purposive and convenience sampling. I purposively wanted to explore the perceptions of the school managers on the use of technological resources to supervise the curriculum. The school managers were easily accessible for data generation since they supervise curriculum in the same circuit where I also work. The environment in which the study was conducted was the Nongoma circuit. For this study, the sample consisted of 12 school managers, who were recruited from 12 different schools guided by their being within a radius of two (2) to four (4) kilometres. Further to this, I recruited participants with four (4) years of experience as school managers. The generated data was analysed in order to find meaning and to make informed decisions about the findings.

## **Data Analysis**

Creswell (2013) concurs with Mayer (2015) when defining data analysis as an activity of making sense of interpreting and theorising data that signifies a search for general statements among categories of data. Thus, in the study, some categories emerged from data (through deductive reasoning), developing into themes while others became themes that were formulated from the TPACK framework. Thus, this study adopted guided analysis with both inductive and deductive reasoning. Further to this, Delcroix (2016) describes inductive reasoning as a process which entails the use of existing knowledge or observation to make predictions about novel cases. Moreover, the later study defines deductive reasoning as a theory-testing process, which commences with an established theory or generalisation and seeks to see if the theory applies to specific instances. I used deductive reasoning to classify participants' responses into themes and draw conclusions. The study adopted guided analysis because analysis arises from both theory and data. Brainard et al. (2016) argue that guided analysis is adaptable to the modification of principles of theories by researchers and allows for the resolution of significant issues that emanate from the data. I ensured that the study was acceptable and trustworthy to the community.

## **Trustworthiness and Rigour**

According to Msweli (2020), qualitative researchers ensure the trustworthiness of their findings by ensuring that the findings are credible, transferable, dependable, and confirmable. Both Brenner (2009) and Mayan (2016) describe credibility as the accurate representation of a particular context or event as described by the researchers. Brenner (2009) further describes credibility as an assurance that the researchers' conclusions stem from the data. I made sure that the generated data was believable and credible to the reader, by providing the evidence and data analysis. Furthermore, for validity purposes, I involved my supervisor in assessing my interview questions and listened carefully when the interviewees were responding. Transferability is defined by Brenner (2009) as the degree to which generalisation can be made from the data and context of the research study to the wider population and settings. Further to this, it is regarded as the way in which the reader can take the findings and transfer them to other contexts. In this study, I enriched transferability by ensuring that the precise findings are of benefit or practicable to other school managers who are not part of the study or included but who are supervising the curriculum. Furthermore, Creswell (2014) describes confirmability as

the extent to which the research findings reflect the perceptions and ideas of the participants. Mundy et al. (2004) argue that for the data to portray confirmability there must be evidence after the data has been generated, categorised, reconstructed, and interpreted. As a result, I ensured that the research questions were relevant and well-phrased to answer the significant research questions.

### **Anticipated Problems/ limitations**

I am also a school manager, so I ensured that I was not judgemental and did not communicate my personal perceptions during the interview sessions. Hence, I did not express my opinion or views during the research project. Thus, I allowed the participants to respond in the way they wished to, without any interference. Further to this, participants might not be reachable due to COVID-19, poor network connections, and the reluctance of participants to take part fully, which might hinder the progress of the study. Moreover, one of the limitations of qualitative research such as this is that it is hard to generalise from a small number of case studies. To overcome this challenge, I increased the sample population to 16 school managers.

### **7. Ethics**

Ethics is a branch of philosophy that deals with the conduct of people and guides the norms or standards of behaviour and relationships with each other (Akaranga & Makau, 2016). These studies further indicate that the term “Ethics” refers to an ‘ethos’ or a way of life and social norms for conduct that distinguish between acceptable and unacceptable behaviour. Thus, educational researchers must take into account the effects of the research as it relates to the participants: Researchers have the responsibility to act in such a way that the participants’ dignity as human beings is upheld. Thus, I used an online platform to apply for a clearance certificate/letter from the UKZN Ethics Committee and for a gatekeeper’s letter from the KwaZulu-Natal Department of Education, to conduct my study. After receiving permission to conduct the research from the Nongoma Circuit, I wrote the participant consent letters and contacted them telephonically to ask them to take part in the research study. After they agreed to participate, I concisely outlined the motive for the study, namely to explore the perceptions of school managers regarding the use of technological resources to supervise the curriculum. Moreover, I informed them both in writing and verbally about their rights to confidentiality and anonymity (their identity and their names were not disclosed to other people) and that their

participation was voluntary. They were free to withdraw from the study at any time, should they have wished to. Further to this, their right to privacy was also enshrined by using numbers, specifically Participant 1-12, instead of their names. Furthermore, Biyela (2018) asserts that according to Section 9 (3) of the Bill of Rights, no person may be discriminated against, directly or indirectly, on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability religion, conscience, belief, culture, language, and birth.

## **Chapter overview**

### **Chapter One**

This chapter seeks to provide the reader with the general background of the study. It also shows the title, the focus, research questions and research objectives of the study, and its location. The chapter indicates the rationale of the study; outlines the researcher's personal rationale for undertaking it; what the literature says about the study phenomenon (school managers' perceptions); the study focus (use of technological resources to supervise curriculum); and the significance of the study. Furthermore, this chapter provides a brief literature review where the knowledge domains of TPACK were outlined (Mishra and Kohler, 2009) in order to determine the research design and methodology.

### **Chapter Two**

Chapter Two reviews literature in the international, continental, and national spheres. This chapter discusses the three prepositions of perceptions (attitude, skill, and professional perception), the strategies of curriculum supervision, and the technological resources used to supervise the curriculum.

### **Chapter Three**

This chapter focuses on explaining the research strategy utilised in this study, particularly strategies used to achieve the research objectives and critical research questions. Moreover, this chapter reveals the research framework adopted as interpretive paradigm. A qualitative research approach was adopted, including data-generation methods using reflective activity, Zoom one-on-one semi-structured interviews, and Zoom focus group discussions. Further to

this, convenience and purposive sampling strategies were employed. Furthermore, issues of trustworthiness such as credibility, transferability, confirmability, and dependability are also addressed in this chapter, including the limitations of the study.

#### **Chapter Four**

In this chapter, the theoretical framework which guides the study is presented. The study explores TPACK as a theoretical framework in order to advance the understanding of school managers' perceptions of the use of EdTech resources to supervise curriculum. Moreover, the following constructs were identified as inherent links to the TPACK theoretical framework: goals, school managers' role, activities, resources, platforms, assessment, content, time, accessibility, and rationale.

#### **Chapter Five**

This chapter presents and discusses the research design and methodology: the qualitative approach located within the interpretivist paradigm, utilising a multi-case study design. Methods used to generate data semi-structured interviews, focus group discussions, and reflective activity. Each of these methods is discussed in detail, providing their strength and limitations as well as their suitability for the study. This chapter also discusses data analysis, issues of trustworthiness, and the limitations of the study.

#### **Chapter Six**

This chapter seeks to address the core of the research topic by presenting data and discussing findings. Discussions of the results are important because they spark a dialogue between the literature and theoretical framework with the aim of establishing truth and/or actualities in accordance with the research questions posed to the participants. Moreover, after engaging with the data produced through reflective activities, focus group discussions, and one-on-one semi-structured interviews, this approach led to data analysis and interpretation. Moreover, this chapter is based on the findings of the research questions.

## **Chapter Seven**

The emphasis in this chapter is on theorising school managers' perceptions, which were provided systematically in the previous chapter. Moreover, the aim is to address the purpose of this study: to explore the school managers' perceptions on the use of EdTech resources to supervise curriculum in the context of COVID-19 .

## **CHAPTER TWO**

### **2.1 Introduction**

South Africa is standing at the apex of the fourth industrial revolution which means school managers can use different resources to supervise curriculum and with this, comes an array of advanced technologies that directly impact all spheres of society and industry (Wade & Mestry, 2021). The latter study further states that, globally, most progressive educational institutions have replaced manual systems and processes with advanced digital devices. Furthermore, research demonstrates that much progress has been made to improve equipment and internet in schools over the last twenty years. Results from the National Center for Education Statistics' (NCES) survey of public school managers revealed that 97% of all school managers have at least one computer in their offices every day (Johnson et al., 2016). As a result, the latter study declares that technological resources are perhaps the strongest factor shaping the educational landscape today.

This chapter provides a review of relevant literature on the concept of perceptions of school managers toward its use of technological resources to supervise curriculum. Thus, Cresswell et al. (2014) assert that a literature review assists in determining whether these topics prepositions of perception, levels of technological resources, and strategies for curriculum supervision are worth studying and provide understanding into ways in which the researcher can limit the scope to a needed area of inquiry. Moreover, the literature review is part of the thesis where there is extensive reference to related research and theory on the school managers' perceptions of the use of technological resources to supervise the curriculum. Further to this, a literature review provides a theoretical background of the study and also helps the researcher to establish the links between what the researcher is proposing to explore and what has already been studied (Saunders et al., 2007). Thus, this chapter intends to address the following aspects understanding the phenomenon (perceptions), levels of perceptions, technological resources, and strategies used for curriculum supervision.

## **CHAPTER TWO**

### **Review of the literature**

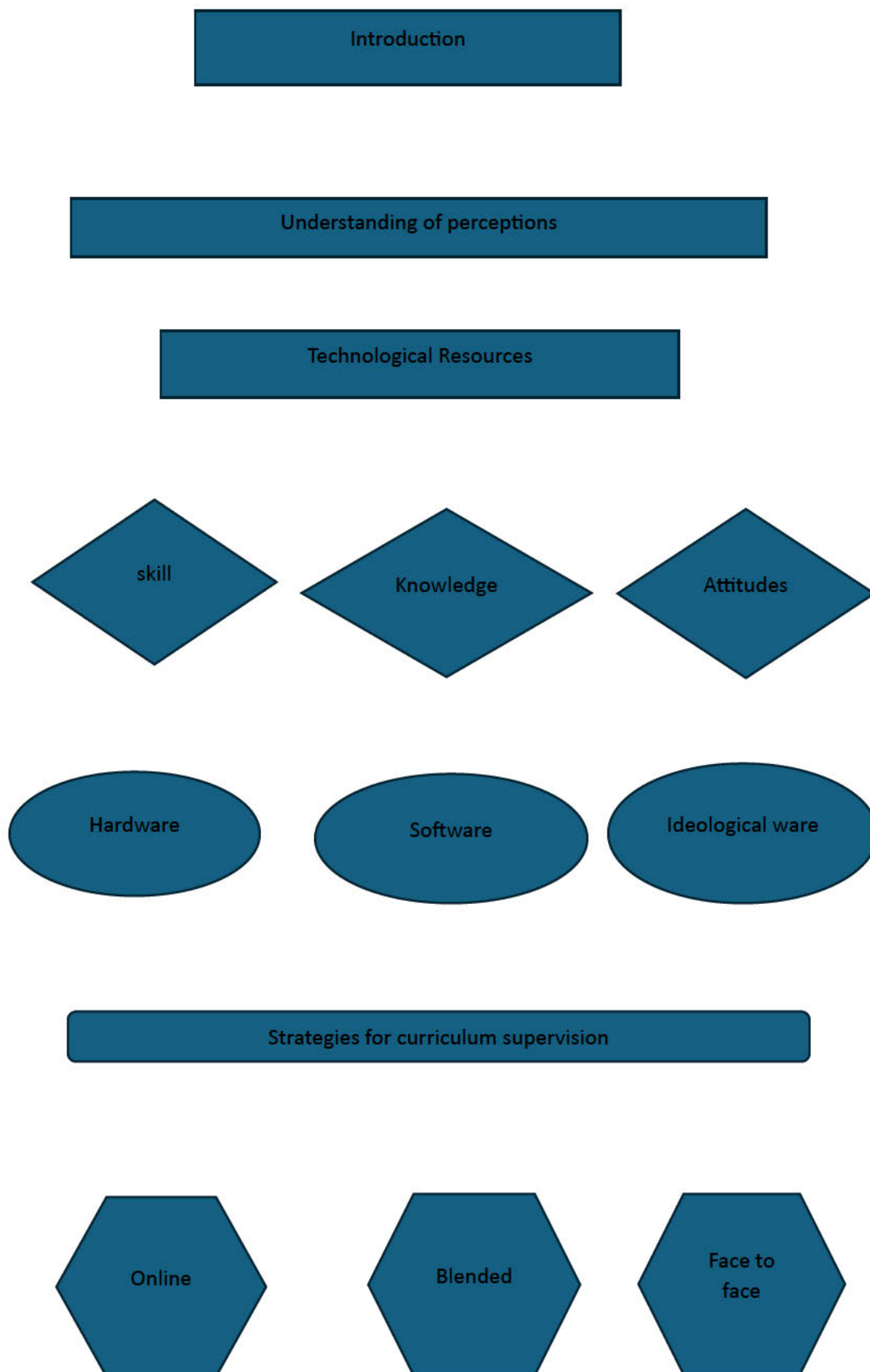


Figure 2.1 the mind map for reviewed literature

## 2.1 Perceptions as the phenomena of the study

Perception originates from the Latin word *perceptio* (perceive) which means to become aware or conscious of the phenomenon and come to realise/understand based on how we interpret sensation through receiving stimuli from the environment and ends with our interpretation of those stimuli (Leal et al., 2012). Moreover, according to Okereke et al. (2019), perception is defined as an act of being aware of one's environment through physical sensation, which denotes an individual's ability to understand a particular phenomenon in a certain context. The latter study further asserts that perception is the process of interpreting information about another phenomenon. This definition has highlighted the reader's attention that the point of view formed about phenomena depends on the amount of information available at disposal and the extent to which it can be correctly interpreted. In other words, the individual may be in possession of the same set of information that other people have on a particular situation, person, or group/cluster but still draw different conclusions as a result of individual diversity in the capacity to perceive the information that we all have. However, Eghe et al. (2014) concur with Bundura (1989) and Tyng et al. (2017) when arguing that perception ranks among the important cognitive factors of human behaviour or psychological mechanisms that enable an individual to understand their environment. This suggests that perception plays a big role in education particularly in curriculum supervision by school managers in order to interpret and make meaning of their actions/practices in their school environment by drawing from their minds through personal perception/interpretation.

Moreover, Nel et al. (2011) agree with Kuhn and Rensink (2016) that the perceptual process begins with attention which is called the selection process which is about personally filtering information perceived in a particular context, which means that the school managers need to be driven by personal way of perceiving things in order to supervise curriculum when using the technological resources. Cicekci and Sadik (2019) and Mupa and Chinooneka (2015) assert that school managers cannot attend to all stimuli they perceive and cannot pay attention to all of them. In other words, school managers need to select the instructions/ideas given to them by society/individuals/employer considering their needs, interests, and expectations that are in connection with the use of technological resources to supervise the curriculum. As a result, school managers tend to develop a particular attitude and this affects how they perceive that activity to be executed, In addition to that, school managers' perceptions are affected by internal factors that come from the school managers themselves, such as feelings, willingness,

thoughts, values, goals, sex, and age, and by external factors that come from outside of the school managers such as department officials/policies, experience, environment, culture and beliefs (Emkic, 2018; ten Hagen et al., 2022). This suggests that the manner in which school managers perceive the use of technological resources to supervise curriculum is influenced by both personal/individual and professional/discipline factors in order to act in a particular way in their schools. This study, therefore, posits that perception is the process of how the school managers select, organise, and interpret information at their disposal and the existing experiences in order to create the whole meaningful information/actions/environment when using technological resources to supervise the curriculum. Furthermore, Ebekoziem et al. (2021) argue that perception is the single most important determinant of human behaviour, particularly in education, which suggests that school managers should be aware of the perception in their schools. In addition to that, by focusing on school managers in a work setting, Bower et al. (2019) draw attention to the fact that since there are no specific strategies for understanding the perception of others, everyone appears to be left with one's inventiveness, innovative ability, sensitiveness, and introspective skills to deal with perception.

Furthermore, the study conducted by Pan et al. (2021) explored the use of technological resources in curriculum supervision. The phenomenological research design was adopted to explore school managers' perceptions of the use of technological resources. The study consisted of 224 school managers from five different regions in Nigde province in central Anatolia, Turkey. The findings of the study revealed that the school managers in the research perceived the use of technological resources in curriculum supervision as a knowledge source, a guide that directs school managers in the curriculum supervision process, and problem solver. In other words, perception allows school managers to act as problem solvers in relation to curriculum supervision issues by drawing from their education profession (use of departmental policy).

In addition to the above, the study conducted by Janbakhsh et al. (2018) explores how perception is formed and its effects on interactions that take place in the school environment. This study supports findings from the study conducted by Saraf et al. (2021), which outlined that few empirical studies were used to measure the school of technological resources in curriculum supervision. Both studies reveal that school managers' perceptions may be influenced by the manner of their upbringing and cultural and societal influences. This suggests that the school managers' perceptions may be perceived/driven by how they received

qualifications/capacitation/workshop toward the use of technological resources and their attitude towards technological resources. Consequently, these factors can have a potential effect on school managers' perceptions and the way they view/perceive the use of technological resources in curriculum supervision. Further to this, the above study supports the findings of the study conducted by Katemba (2020) in Indonesia, the study intended to explore the challenges experienced in implementing the use of technological resources in curriculum supervision and it was quantitative in nature. The participants of the study were randomly chosen from 30 school managers from Bundug in rural areas. The result of this study showed that using technological resources to supervise curriculum was helpful and I was depending on how they want the school managers perceive technological resources. For instance, more resources and facilities provided by schools and education department are increasingly helping school managers to improve their competency to use technological resources, but the way they perceive, it is different. In other words, the way the use of technological resources in curriculum supervision is perceived may lead to the success or failure of curriculum.

In an African context, see the quantitative study conducted Feyisa et al. (2022) investigating principals' perceptions on the use of technological resources to supervise curriculum in Lesotho concurs with the study conducted by Wanjala et al. (2013) in Zambia, the main aim of the study was to ascertain the perceptions of school managers on the use of technological resources to supervise the curriculum of the public secondary schools in Kimilili District, Bungoma Country, Kenya. The findings of the study revealed that the school managers lacked the basic hardware and software technological skills in curriculum supervision. Thus, this suggests that the school managers were perceived as unable to complete the self-evaluation, baseline, and summative tasks for the quality management system. In other words, the school managers lacked basic skills for using hardware and software resources during the process of the quality management system.

In addition, Chandrawati (2021) avers that perception is our sensory experience of the world around us and involves both the recognition of environmental stimuli and actions in response to these stimuli. In addition to that, perception is an interaction between an individual and the environment (Mlaba, 2020). In other words, the interaction between school managers and the use of technological resources in curriculum supervision may be perceived as a relief in the educational environment in terms of alleviating the spread of the COVID-19 virus.

Furthermore, the interpretive case study conducted by Khoza (2016b) explores the perception of school managers on the use of technological resources and their goals for supervising curriculum in the South African context. Furthermore, this study concurs with the qualitative action research study conducted by Mpungose (2020a) on how five school managers perceived curriculum supervision through the use of technological resources at South African University. The study adopted a critical methodological paradigm. These studies revealed that the school managers were driven by all levels of perceptions such as attitude, skill, and professional when using technological resources to supervise curriculum. The studies also reveal that the school managers lack content knowledge, technological knowledge, and pedagogical knowledge, and school managers were not aware of the rationale that underpins their curriculum supervision using technological resources. In other words, school managers were not aware of the perception driving them to use technological resources. As such, school managers seem to be unaware of policies/manuals that speak on the use of technological resources in curriculum supervision, including the pedagogy in which those resources are used for curriculum supervision.

In addition to that, Démuth (2013) agrees with Winter et al. (2021) that school managers can draw from attitude, skill, and professional perception when using technological resources to supervise curriculum.

### **2.1 How are school managers' attitude perceptions maintained?**

Ngema and Lekhetho (2019) support Mongush et al. (2022) that attitude perception is a perception that seeks school managers to draw from certain theories/methods, self-identity, love, and passion in order to address their needs when using technological resources to supervise curriculum. In support of this assertion, see a study conducted by Khoza (2016b) on curriculum perceptions. The studies finds that school managers are driven by aims in order to enact curriculum supervision when using the technological resources which address their self/attitude identity. That is why, Mpungose (2017) and Rintala (2020) assert that attitude perception becomes the background of skill and knowledge perception. In other words, school managers should first understand their self-identity, so that they can be in a good position to understand and work according to their strengths and weaknesses. Furthermore, attitude perception addresses the needs of individual school manager and are mostly generated from their unique and different background or autobiographical perceptions/experiences (Khoza,

2016b; Mpungose, 2020a; Zuma, 2019a). This suggests that attitude perception is a main rationale among the others (skill and professional) that personally drives or motivates school managers to supervise curriculum using technological resources. As a result, attitude perception seeks that school managers perceive attitude curriculum signals such as aims, blended supervision, ideological-ware resources, extra time, formative assessment, extra-curricular activities, and process procedure as the most significant elements in curriculum supervision (Khoza, 2016b; Mpungose, 2020a; Schoenfeld, 2016).

In addition to the above, Shezi (2019) concurs with Mqadi (2015) that aims are long-term broad visions for school managers and give broad supervision as the core duties of the school manager. As such Khoza (2016b) advocates that school managers should be driven by long-term goals when using technological resources in order to supervise curriculum effectively. Further to this, aims are essential to curriculum supervision using technological resources as they outline and anticipate good output (Kennedy, 2006; Nkohla-Ramunenyiwa, 2020). Similarly, the latter studies further assert that aims in an attitude perception drive any action of a school manager to achieve targets for each quarter of the year. For instance, ensuring that proper functioning and collaboration of school managers, personnel and technological resources are involved in curriculum supervision and also providing support and guidance in schools. Khoza (2019b) elaborates that curriculum supervision presents a clear outline of aims. Nevertheless, these are presented in such a way that school managers do not understand them. School managers think that their core duties do not have aims because they are demotivated to use technological resources to supervise the curriculum (Oliva, 2013; Onen, 2015). In other words, aims play an integral part in the accomplishment of aims towards curriculum supervision using technological resources. Furthermore, Mpungose and Khoza (2020) declare that ideological-ware resources, like (cognitivism and Connectivism) are ideas/theories or methods that motivate school managers to use resources effectively to supervise curriculum. Ideological-ware resources play an integral part in ensuring the use of technological resources in curriculum supervision in order to yield desired aims. Likewise, Budden (2016) concurs with Khoza (2013) that ideological-ware resources drive all the curriculum supervision activities (monitoring, meetings) about the supervision of the assessed curriculum. As such, when school managers understand their identities/ideological-ware, they supervise curriculum better because they use relevant theories (Khoza & Biyela, 2020). Amory (2010), Khoza (2018), and, Khoza and Biyela (2020) declare that curriculum supervision is the transformation of thoughts using the conscious mind and are the main ingredients to ensure the success of the

implementation of curriculum supervision using technological resources. This suggests that school managers should use or apply their minds when using EdTech resources so that curriculum supervision can yield better results. Nevertheless, Koers and Kracht (1991) declared that the more ideological-ware resources and different of curriculum supervision a curriculum manager comes into contact with subordinates the more they can learn about curriculum supervision. The latter studies further affirm that school managers can supervise curriculum better when using technological resources. This suggests that when school managers are influenced by attitude perception when supervising curriculum using technological resources can show much improvement in their practices. In other words, attitude perception on the use of technological resources in curriculum supervision is perceived as most assisting to overcome challenges experienced by school managers when performing their supervisory core duties. Moreover, Mlaba (2020) concurs with Mpungose (2020a) that attitude perception becomes relevant if it probes assumptions and practices viewed as making supervisory duties easier but that finally work against our best long-term interests. These studies further underpin that ideological-ware resources and attitude perception are the basis for the proper implementation of the use of technological resources to supervise curriculum using blended supervision.

Blended supervision is defined as the integration of traditional face-to-face curriculum supervision with online curriculum supervision (Avazmatova et al., 2020). Moreover, Avazmatova et al. (2020) conducted a study research paper examining the importance of blended supervision in the curriculum using technological resources. The findings of the study reveal that blended supervision boosts the effectiveness of using technological resources for curriculum supervision, increased access and convenience, and greater cost-effectiveness. This suggests that school managers seek to be driven by attitude perception so that they can come up with innovative activities that promote school managers' attitude breadth and depth for supervising curriculum. However, Szadziewska and Kujawski (2017) argue that when blended curriculum supervision is used, school managers encounter log-in and downloading problems, lower motivation to supervise curriculum, and lower creativity in searching for a positive attitude. In other words, if blended curriculum supervision using technological resources is not supported by attitude perception and not effectively implemented by school managers, curriculum supervision can become a fiasco. Furthermore, both curricular and extracurricular activities require school managers to work extra-time (a time that school managers appear to be paying attention to that have instructional goals) in order to expect a much higher degree of curriculum supervision to assimilate content and develop and achieve excellence (Kaplan et

al., 2014). Further to this, Farbman (2015) indicates that if school managers add time to the school day practising both extra-curricular and curricular activities can have a meaningfully positive impact on using technological resources proficiently when supervising curriculum and, indeed on subordinates' entire supervision perception. Moreover, extra-time creates more time for unpacking content for curriculum supervision. However, Beigi (2020) stressed that school managers working extra hours supervising curriculum using technological resources can enhance the negative relationship between school managers and quality of working life, resulting in a high level of stress. This suggests that school managers should be perceived as driven by attitude perception to achieve the curriculum supervision goals by devoting and committing themselves to work extra-time.

As such, content is defined as attitude, and values (freedom, fairness, integrity, responsibility and respect) culminating in curriculum supervision activities that school managers experience in and outside the school (Ball et al., 2008; van den Akker et al., 2018). The latter studies assert that when the values for curriculum supervision are well unpacked and understood then their positive outlook regarding curriculum supervision can lead to improvement in their leadership roles (Emparan et al., 2019). Further to this, the study conducted by Shidiq et al. (2022) in Singapore, introduced the values of content of curriculum supervision using technological resources. The study reveals the challenge of developing a set of values in school managers in acquiring their proficiency and competence in curriculum supervision, and it is impossible for a school managers programme to prepare school managers for all situations. This suggests that school managers should be driven by attitude perception to learn from their attitude perceptions in ever-changing circumstances concerning curriculum supervision using technological resources.

Moreover, Nhlongo (2020) believes that it is common sense to assume that what a school manager knows can influence curriculum supervision. Thus, to strengthen their efficiency can ensure that they have the right attitude toward their curriculum supervision content. When studying what school managers need to know- perceptions of course content in the department of basic education pedagogical courses and its influence on curriculum supervision (Silander & Stigmar, 2021). The study revealed that university managers need to know the pedagogical content knowledge to transform the content into forms that can help school managers understand and supervise curriculum using technological resources. This suggests that school managers need attitude perceptions that assist in improving their practices when using

technological resources. Furthermore, the use of technological resources in curriculum supervision can allow school managers to get involved in collaborative curriculum supervision and forming curriculum supervision communities (Suryani, 2010). In other words, school managers have the potential to improve curriculum supervision if they are influenced by attitude perception because they can easily unpack the content for curriculum supervision in their respective schools without experiencing challenges.

Furthermore, understanding the school managers' roles (providing leadership using an authoritative style) when using technological resources to supervise the curriculum can improve school managers' performance. In addition, Chalikias et al. (2021) concur with Silva (2016) that leadership is defined as the process of interactive influence that occurs when, in a given context, some people accept someone as their leader to achieve common goals. Similarly, Tarekegne (2018) and Angura (2020) state that leadership have an essential role (instructor and councillor that provides pastoral support) and the responsibility to play in school effectiveness and diffuses through goal setting and accomplishment of curriculum supervision using technological resources that have to present all at staff workshop in order to observe their work concerning curriculum supervision and provide extensive feedback. Furthermore, if school managers have adequate knowledge and adopt the use of technological resources in curriculum supervision can enable school managers to instruct the supervisees to use technological resources in their practices (Ghavifekr & Rosdy, 2015). Further to this, school managers, being instructors can help to ensure that their supervisees learn about their respective practices to execute and can offer various stimulating ways for curriculum videos, storage of data, and the use of data base that can make the curriculum supervision process more fulfilling and meaningful (Ghavifekr & Rosdy, 2015). However, the qualitative descriptive study conducted by Irawan (2020) in PGRI Yogyakarta explored the school managers' perceptions and the weaknesses of being an instructor when using technological resources in curriculum supervision. The results showed that being an instructor when using technological resources in curriculum supervision, is time-consuming, causes harm to the school managers' health, and slow loading if there is a lack of internet connection. This suggests that school managers should be influenced by attitude perceptions. In other words, school managers should be perceived as good thinkers and proactive (for instance installation of back-ups) in order to ensure that no obstacles happen during the process of curriculum supervision.

In addition, formative assessment is defined as an assessment which monitors school managers' progress without grading and uses this information to adjust curriculum supervision using technological resources (Black & Wiliam, 2009; Edwards et al., 2010). The latter studies further declare that good assessment practices are integral to informing curriculum supervision as well as measuring and documenting school managers' achievement. Formative assessment has been shown to significantly improve school managers' curriculum supervision by giving them a better understanding (Black & Wiliam, 2009). Further to this, the use of formative assessment on the use of technological resources for curriculum supervision may inform school managers of certain successes and challenges which school managers encounter in the use of technological resources in curriculum supervision (Nhlongo, 2020). Nevertheless, Damanhour (2021) declares that conducting formative assessment thoroughly requires professionally qualified school managers who are able to analyse the criteria for mastery and create appropriate measures to assess school managers' progress. In other words, school managers should be knowledgeable about the principles of formative assessment in order to achieve the aims the curriculum supervision. Thus, the school managers should have a clear process procedure to address the problem through the introduction of using technological resources for curriculum supervision. Therefore, procedural procedure means being more follower-driven (Hurrell, 2021)

## **2.2. How do society and friends influence the perceptions of school managers?**

With this vision, the use of technological resources in curriculum supervision should be implemented according to the opinions or visions of the community/society (Khoza, 2016b; Nhlongo, 2020; Zuma, 2019a). In other words, the use of technological resources in curriculum supervision should be as result of the society, school managers, and the circuit management's inputs. Further to this, skill perception is summarised as the fraction of the society that ascribes to a particular opinion, the heterogeneity of perceptions that exist in the community, or the reasons behind various perceptions (Beck et al., 2013; Collier, 2015; Manan, 2020). Furthermore, Prajapati et al. (2017) further define skill perception as a group of psychosocial competencies that can help school managers make informed decisions, and solve problems emanating during curriculum supervision using technological resources. Similarly, being creative and innovative in implementing curriculum supervision skills is necessary so that the curriculum supervision atmosphere is always interesting and enjoyable for school managers (Sugihartini et al., 2019). Therefore, it is crucial to build relationships with stakeholders and

solicit input from curriculum supervision/technological resources developers and other parties involved (Poku-Boansi, 2021). This suggests that if school managers are perceived as driven by skill perception, they can improve their practices and have a positive impact towards using technological resources for curriculum supervision.

Skill perception is aligned with Dewey's (1933) approach to education which is learner-centred and aligned with the horizontal/competence curriculum supervision in order to use technological resources to meet the needs of the community. In other words, the use of technological resources in curriculum supervision should be used/integrated in order to meet the needs or visions of the community, colleagues, and friends (Nhlongo, 2020). This suggests that the use of technological resources in curriculum supervision should be the strongest link of curriculum supervision school managers' opinions. This may assist in administering the curriculum supervision in school because it can accommodate different beliefs, skills, and visions among the staff. However, one cannot accept the idea of working with friends and retired colleagues because some ideas and opinions are not scientifically confirmed or researched (Bhardwaj & Goundar, 2018; Saunders et al., 2007). Further to this, Nhlongo (2020) agrees with Khoza (2016b) that using technological resources in curriculum supervision from the society's view/perspective can yield negative outcomes because curriculum supervision in accordance with visions, and ideas are mostly influenced by opinions, friends, or general skills and oral conversations. In other words, their opinions are perceived as influenced by skill perceptions in order to address supervision outcomes.

Furthermore, Kennedy (2006) declares that supervision outcomes are statements set by school managers about what they should expect, understand, and be able to do at the end of supervising curriculum using technological resources. In addition to the above, Meiers et al. (2007) concur with Kazu and Demiralp (2017) that outcomes and skill perception can play an integral part in assisting school managers when supervising curriculum as their intentions. For instance, if the curriculum supervision using EdTech is well implemented by school managers, the teacher is be able to observe teaching and learning, school managers can assist teachers in their professional development, both in individual and group context, and the evaluation of teachers, research and revision of the curriculum, the undertaking to provide the required supervision in designing suitable plans and strategies to supervise curriculum and enable schools to realise its learning outcomes (May & Hornberger, 2017). However, Northwood (2013) states that supervision outcomes do not engage school managers, merely impart information (lack of

dialogue) and kill originality and creativity especially, in curriculum supervision. This suggests that school managers who have successfully used technological resources on curriculum supervision can achieve good outcomes for the programme provided technological resources are used effectively. In other words, the school managers influenced by skill perception can improve their practice and function such facilitation curriculum supervision workshops (Kazu & Demiralp, 2017; Meiers et al., 2007).

Furthermore, see the study conducted by Matanhire (2017) investigating the role of school managers as facilitators for curriculum supervision using EdTech in schools. The findings of the study showed that school managers as facilitators for curriculum supervision assume multi roles that contribute to building the school community and skills for curriculum supervision among school managers and also reveal that school managers have the potential to dismantle anxieties associated with curriculum supervision using EdTech from diverse backgrounds and of diverse abilities. In other words, the school managers should equip/develop themselves/each other with the necessary skills (monitoring, supervising, and problem-solving) for curriculum supervision using technological resources in particular. Further to this, Nhlongo (2020) concurs with Khoza (2012) by stressing that facilitation towards the use of technological resources present opportunities to develop autonomous school managers. Similarly, Martin, Wang, et al. (2020) emphasise that using a facilitation strategy (online) helps to maintain high academic standards in online curriculum supervision. For example, school managers can organise and facilitate capacity-building workshops for career choice and career dress-up days for teachers teaching Life Orientation like how to coordinate the activity at school, specifically to choose a suitable career field such as working with computers for a living (writing computer programs, installing computer software, doing mathematics is compulsory). However, Klynveld (2015) concurs with Pruchnicki (2018) that the major weakness of facilitation is a lack of time, too few technological resources, and a lack of school managers' skill perception in curriculum supervision when using technological resources to conduct peer assessment. This suggests that school managers should be driven by skill perception in order to play their role as facilitators so as to assist their subordinates in understanding how curriculum supervision using technological resources is conducted and employing different strategies to accomplish their supervision outcomes. Moreover, peer assessment/evaluation plays a crucial role in the success of the school outcomes.

Peer assessment (previously known as evaluation) is described as an arrangement in which school managers consider the level, value, quality, or outcomes of curriculum supervision using technological resources of peers of similar status (Tighe-Mooney et al., 2016). Further to this, Amendola and Miceli (2018) declare that peer assessment has been increasingly integrated into curriculum supervision settings as a strategy to foster curriculum supervision using technological resources. Moreover, the latter studies further stress that peer assessment can engage school managers in curriculum supervision and also encourage group assessment and skill perception by applying a placement test, proficient test and diagnostic test. According to Li and Gao (2016), peer assessment can assist school managers in making informed judgements about their peers' strengths and is an important skill that can help school managers in their schools. Similarly, (Panadero & Brown, 2017) state that school managers play a critical role in mediating the implementation of intended policies for curriculum supervision using technological resources. Likewise, Msiza et al. (2020) state that school managers who administer peer assessments have an opportunity to learn the content and develop assessment skills for curriculum supervision using technological resources. For instance, during an integrated quality management system (IQMS) the school manager's peer can form part of a school development team (DSG) whereby can assess/evaluate them by asking questions like does they consistently delegate tasks to their supervisees for the purpose of building capacity? Then rating scale of one out four can be given: one means poor performance, two means satisfies minimum expectations, three means good performance, four means outstanding performance (Dhlamini, 2009). Nevertheless, Li and Gao (2016) state the major drawbacks of peer assessment is peer pressure and some school managers can feel uneasy and reluctant to assess their peers' performance and rating could be easily affected by friendship and collegiality. In other words, school managers should be perceived as driven by skill perception in order to overcome barriers experienced, and gain/equipped with different forms/strategies of assessment during the process of curriculum supervision using software (technological) resources.

Furthermore, Khoza (2016b) describes software resources as those which help to display information from the hardware. Moreover, see the results of the study conducted by Mafang'ha (2016) in Tanzania, the study mainly aimed at collecting views and opinions from school managers regarding their perceptions of the use of software resources to facilitate curriculum supervision. The findings of the study revealed that school managers have access to the global

knowledge base and technological resources to simplify school managers' work (curriculum supervision). For example, Livewire is a sophisticated software package for designing and simulating electronic circuits. Switches, transistors, diodes, integrated circuits, and hundreds of other components can all be connected to investigate the behaviour of a circuit. There are no limits to what can be designed, and no loose connection or faulty component to worry about. Just grab the components you need and connect them using the Livewire intelligent wiring tool. Make any final adjustments to your circuit by moving components (Ibrahim, 2016).

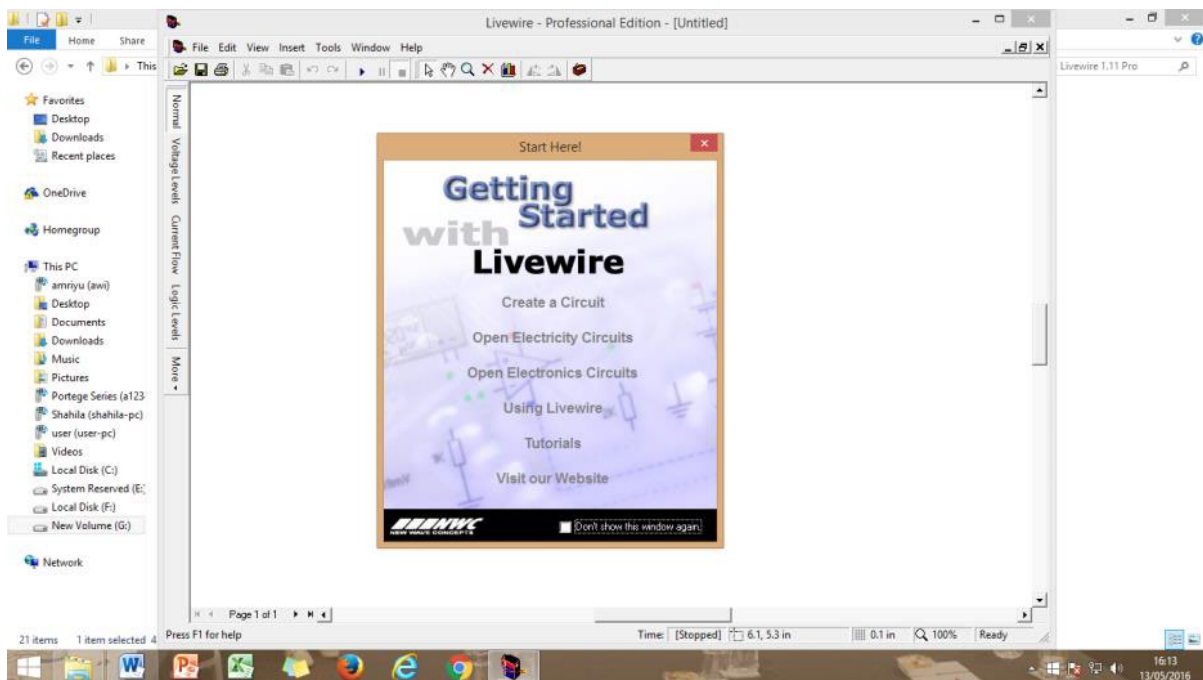


Figure 2.3 A screenshot from the livewire educational software

Nevertheless, Matešić et al. (2009) declare the main disadvantage of using software resources as a tool for curriculum supervision tool, is the further computerisation of the curriculum supervision process which would significantly reduce the quality of the same. In school managers' perceptions the curriculum supervision process should be as simple as possible and based on traditional curriculum supervision models without the implementation of Edtech. This suggests that skill perception enhances and improves the implementation of a culture of curriculum supervision using Edtech.

Furthermore, the qualitative study conducted by Thaba-Nkadimene and Mmakola (2019) in Limpopo, the main aim of the study was to investigate school managers' perceptions as well as the factors that promote or impede the culture of curriculum supervision using Edtech. The findings of the study reveal that staff development, support systems, monitoring, and evaluation have an impact on effective curriculum supervision when using Edtech. The study concludes that effective curriculum supervision using EdTech promotes effective curriculum supervision when using EdTech. This suggests that school managers should be influenced by skill perceptions in order to ensure that there is a conducive school environment and sound culture of curriculum supervision when using EdTech. For example, school manager should be approachable, empower their supervisees with the necessary material, and provide support such as routers and data and deliver them with both intrinsic and extrinsic motivation to ensure the improvement of performance. Further to this, school managers and supervisees to be always kept online can fast-track the curriculum supervision when using EdTech.

In addition, online curriculum supervision is defined as an educational programme in which school managers use curriculum strategies that combine both face-to-face with individual and computer-based (online) curriculum supervision-without being confined to school time (Caner, 2012). School time refers to the time spent by school managers at school supervising the curriculum using technological resources. Likewise, time management is a skill that is not only important for school managers to implement in their curriculum supervision but also in the achievement of their academic goals (Kapur, 2018). However, Indreica (2014) concurs with Harpaz (2002) that managing school time takes longer to create plans and it makes school managers feel a lot of work on their shoulders, as a result, they make total mistakes. In other words, school managers should be driven by skill perception when supervising the curriculum using EdTech (educational technology) to ensure they are resilient, managed their emotions, acquire knowledge and skills, and sustain a positive and motivating culture, shared responsibility, teamwork and high levels of collaboration and communication through the guidance of prescripts from the Department.

## **2.2. What is the impact of knowledge perception in curriculum supervision when using EdTech?**

In addition to that, knowledge perception is a perception that places a core-duties (monitoring, professional development, planning, and controlling) at the centre during the process of curriculum supervision using technological resources (Khoza, 2016b; Mpungose, 2017). Further to this, if school managers are influenced by knowledge perception, technological resources for curriculum supervision are utilised as a technology for dealing with external motivation factors (policies, salaries) which encourages more punitive use of the programme for academic misconduct (Orme, 2017; Zuma, 2020). This suggests that when school managers are driven by knowledge perceptions, they are addressing the departmental subjects (policies and prescripts) because they should understand details about their supervisory duties to be performed (Meiers, 2007; Mpungose, 2017). As a result, the main emphasis is on the provision of professional services to be executed in such a way that each service stands on its own and has its own collection of terms, signals, or concepts such as hardware resources, summative assessment, professional development, product procedure, supervisor, face-to-face, instructional time, and objectives (Khoza, 2016b; Mpungose & Khoza, 2020). In other words, the school managers should refer to a guide that can serve as a policy on what to do and not to do before starting to use EdTech to supervise the curriculum. For instance, school managers should ask themselves questions like what assessment should be involved in curriculum supervision (Mpungose & Khoza, 2020). Furthermore, summative assessment (previously known as summative evaluation) is defined as a process that concerns the final evaluation for school managers whether the use of technological resources to supervise curriculum meets its objectives (Taras, 2005). Summative assessment is the type of evaluation that judges the worth of the task by the end of curriculum supervision using technological resources (Rusznyak, 2012). In addition, the usage of summative assessment surely can have a great impact on curriculum supervision using technological resources such as changing knowledge perception and behaviour of school managers (Rusznyak, 2012). Likewise, summative assessment can offer an opportunity to refresh school managers' memories of what they previously capacitated/workshopped and also provide a snapshot for class managers to see if they know the collective points (Black et al., 2011). According to the studies, summative assessment is known as summative evaluation and happens when school managers conduct a summative evaluation on their supervisees, they observe teachers whether they create a positive learning and teaching environment when teaching in their classrooms, do they participate in extra-mural and co-curricular activities in the school, and do they keep record of learners assessments and are neatly kept, organised and updated regularly (Díez et al., 2020). Nevertheless, Khaled and Khatib (2020) declare that summative assessment has limited cognitive level tested, requires a

large number of questions to match multi-choice questions, requires curriculum supervision training in the use of technological resources to assure reliability, and is time-consuming for school managers conduct. This suggests that school managers should be driven by knowledge perception in order to ensure that they do not go astray when supervising curriculum using technological resources, but rather enact what is prescribed from the policy document. Further to this, the school policy can further stipulate the submission dates/days in order to achieve the objectives of the curriculum.

Moreover, objectives are defined as short-term goals generated according to school managers/department's intentions, to be attained at the end of the programme (Khoza, 2019b; Mlaba, 2020; Shoba, 2018). Further to this, Makumane and Khoza (2020) concur with Nhlongo (2020) in viewing the formation of objectives as an important stride, thus objectives determine the type of technological resources to be used in curriculum supervision, for instance, school managers may opt to use EdTech that can assist teachers in their professional development and observation of teaching and learning through checking their lesson plan on their teaching files and through conducting announced or impromptu class visits. Likewise, objectives are the key attribute to a well-organised educational design in an application curriculum supervision using technological resources (Makumane & Khoza, 2020). However, the latter studies assert that objectives are usually presented in writing and school managers are expected to enact them as they intended. Thus, this suggests that school managers should draw from knowledge perception that can serve as a directive for what/how objectives are to be attained. In other words, school managers should be familiar with curriculum supervision policies and knowledge for interpreting them accordingly in order to produce the frames of the content to be supervised according to specific technological resources used for curriculum supervision.

In addition to the above, content is defined as knowledge, attitude, and values in curriculum supervision activities that school managers experience in and out of the school (Loewenberg Ball et al., 2008; van den Akker et al., 2018). Similarly, Zuma (2020) and Ball et al. (2008) declare that content indicates a wide range of aspects, such as knowledge, and the supervision of the curriculum and applies in diverse topical areas. The department of basic education policy specifies what school managers can look for in the content during curriculum supervision using technological resources (Khoza, 2015). For instance, school managers should use a tool to check whether the supervisees have used expert knowledge, and assessment standards to promote learner interest and research in the specific subject during the teaching and learning

process, and, provide feedback using a variety of strategies by using remedial and enrichment measures that instil confidence in learners to achieve intended learning outcomes (Díez et al., 2020). In addition, see the study conducted by Anello (1995) investigating school managers' attitudes (willingness to share ideas/responsibility, genuine caring and kindness, sincere sensitivity to the supervisees' diversity, a motivation to provide meaningful curriculum supervision using EdTech experience/perception, and enthusiasm for stimulating the school managers' creativity) towards the content in curriculum supervision activities using EdTech. The findings of the study revealed that school managers' attitudes were not critical, and they did not occur as frequently in their schools. This suggests that the school managers should draw from knowledge perception which will guide school managers on how and when, frequent curriculum supervision should occur through the use of EdTech. In addition, Brady (2011) concurs with Chong et al. (2011) as well as Masote (2016) that the relationship of trust between school managers should be entrenched in order to assist supervisees to instil the content values in the entire school. Further to this, the latter studies further assert that empathic understanding helps school managers demonstrate a sensitive understanding of how supervisees think and feel about curriculum supervision using EdTech. In other words, school managers should be influenced by knowledge perception when considering the values (perseverance, responsibility, care for others, integrity and commitment) of curriculum supervision using EdTech. In light of this, school managers can refer to policy documents in order to be correctly guided and gain courage, confidence, passion as well as tolerance when working with supervisees and enhance smooth curriculum supervision when using EdTech (Esmaili et al., 2015).

Additionally, the study conducted by Rice and Kitchel (2016) concurs with the findings of the study conducted by Bachtiar et al. (2015) that school managers' development of curriculum supervision content knowledge when using EdTech including knowledge of curriculum supervision and supervisees overtime as it was found influential knowledge base. Further to this, the latter studies further declare that providing school managers with more opportunities to explore integrating supervisees' prior knowledge into the curriculum and incorporating supervisees thinking about curriculum supervision using EdTech content more specifically in school managers' preparation is highly recommended. In other words, school managers who are not knowledgeable on content they supervise cannot supervise curriculum using technological resources effectively. This suggests that the policy articulates that all school managers are expected to be capacitated in correct academic practices including curriculum

supervision and professional development especially, using face-to-face can ascertain the achievement of curriculum objectives.

Furthermore, Morgan (2012) concurs with Khoza (2012) that curriculum supervision is dominated by a face-to-face platform, and is one in which curriculum supervision occurs in the same geographical location in which school managers and their subordinates interact (Nhlanzi, 2018; Redmond, 2011). The latter studies further assert that the face-to-face platform helps school managers to understand, interpret, and use EdTech curriculum supervision effectively in order to enhance success in the school. Similarly, Sichau and Fässler (2017) stress that face-to-face interaction helps school managers estimate their current level of knowledge and detect topics where they have not yet reached the required level. The latter studies further assert that the face-to-face platform helps school managers to receive regular feedback which increases the chances of successfully finishing the lesson, as the school managers know their level of knowledge, which helps them to focus on their individual knowledge gaps. For instance, school managers can use face-to-face platforms to advise their supervisees to engage in class teaching that can foster a purposeful progression in learning and which is consistent with the learning areas (subjects) and programmes of subjects and grades as determined (Sykes et al., 2012). This should be done by supervisees by designing lesson plans and lesson preparations and applying all forms of assessment in their respective classrooms. Nevertheless, Gherheş et al. (2021) declared that using a face-to-face environment can be unsafe since, with the beginning of the pandemic, the COVID-19 virus has mutated into several variants. The physical environment is not flexible because the face-to-face environment is time bound meaning school managers need to follow a rigid schedule every day for curriculum supervision. This suggests that school managers should be driven by knowledge perception in order to ensure they do not go astray with the government policy in connection with curriculum supervision using hardware resources.

Moreover, curriculum supervision is also facilitated through physical tools, known as hardware resources (Khoza, 2018). Hardware resources such as desktop computers, and books, are described by Khoza (2015) as any physical/tangible resources or tools that help with the curriculum supervision process. Moreover, the study conducted by Keengwe et al. (2008) provides a review of the literature on hardware resources used by school managers in curriculum supervision. The findings of the study reveal that hardware resources can provide diverse tools for school managers with disabilities that encourage autonomous behaviour as

well as increase the probability that they can interact with their curriculum supervision environment. The findings further indicate that hardware resources can help school managers to improve their performance in terms of curriculum supervision on standardised assessment during quality management systems. For example, their score sheet (a sheet where allocated marks/points are entered) can be neat and records can be captured on these desktop computers for easy retrieving. However, look at the findings of the study conducted by Harrell and Bynum (2018) investigating the factors affecting the proper implementation of curriculum supervision by school managers using EdTech. The findings reveal that to succeed, curriculum supervision using EdTech must be supported by a strong hardware resource. Self-efficacy is the belief that school managers can perform a task (curriculum supervision using EdTech) to achieve desired objectives. Studies focus on the principles self-efficacy involving curriculum supervision using EdTech accomplishment (Harrell & Bynum, 2018). Thus, it is imperative to have hardware resources in schools for curriculum supervision purposes. Therefore, this suggests that school managers should be influenced by knowledge perception when supervising curriculum using EdTech in order to ensure that the school community meets all the requirement of the 21<sup>st</sup> century such as easily facilitated skills and professional development is facilitated.

In addition to the above, Edwards et al. (2019) declare that school managers should act as professional developers since they play a crucial role in the development of teachers in the working environment. Further to this, the role of competent school managers, according to the policy of school managers, is described as the demonstrated ability to integrate theory and practice of different roles in curriculum supervision using technological resources (S. Mandal, 2018; Zuma, 2020). Similarly, school managers have been empowered to be responsible for the professional development of school curriculum supervision using technological resources (Avidov-Ungar & Herscu, 2020). For instance, school managers can use a particular technology to design a Professional Development Plan (PDP) in order to improve supervisees' ability in various areas, which may include teachers' demonstration of leadership, reflection on educational practices, teachers' ability to build a respectful environment for the school community, and teachers' display of knowledge within a content area (Stalnaker-Shofner et al., 2022). This can be done through observing school managers when practising curriculum supervision using EdTech. Nevertheless, the study conducted by Morze et al. (2022) in the Ukraine analysed the disadvantages of conducting professional development. The results reveal that there is an excessively applied orientation of curriculum supervision using

technological resources and the absence of cultural disciplines. This suggests that school managers should draw from knowledge perception when conducting professional development. In other words, professional development equips the school managers and enhances their self-confidence when implementing curriculum supervision process using EdTech during instructional time.

Furthermore, instructional time is described as the time scheduled by the school managers for the use of technology in curriculum supervision where it directs school managers' and subordinates' interactions (Wilson, 2019). For instance, instructional time in the Foundation phase is as follows according to the South African Curriculum Policy Document (CAPS):

SUBJECT	GRADE R (HOURS)	GRADES 1-2 (HOURS)	GRADE 3 (HOURS)
Home Language	10	7/8	7/8
First Additional Language		2/3	¾
Mathematics	7	7	7
Life Skills	6	6	7
▪ Beginning Knowledge	(1)	(1)	(2)
• Creative Arts	(2)	(2)	(2)
• Physical Education	(2)	(2)	(2)
• Personal and Social Well-Being	(1)	(1)	(1)
TOTAL	23	23	25

**Table 1.1 instructional time for Foundation phase adapted from (Makgato, 2018)**

- Instructional time for grades R, 1, and 2 is 23 hours and for Grade 3 is 25 hours.
- Ten hours are allocated for languages in Grades R-2 and 11 hours in Grade 3. A maximum of 8 hours and a minimum of 7 hours are allocated for Home Language. A minimum of 2 hours and a maximum of 3 hours for Additional Language in Grades R-2. In Grade 3 a maximum of 8 hours and a minimum of 7 hours are allocated for the Home Language and a minimum of 3 hours and a maximum of 4 hours for First Additional Language.

- In Life Skills Beginning Knowledge is allocated 1 hour in Grades R-2 and 2 hours as indicated by the hours in brackets for Grade 3.

This suggests that school managers should ensure that the supervisees meet these standards as stipulated on CAPS document. In other words, school managers should be driven by knowledge perception to ensure that the objectives of policy document are accomplished.

Furthermore, school managers can utilise the instructional time to meet each school's individual managers' needs in order to achieve the vision of the school. Likewise, Mupa and Chinooneka (2015) state that instructional time assists school managers to focus on the use of EdTech in curriculum supervision and understanding, being thoughtful and respectful about their curriculum supervision practices. In addition to the above, the latter studies further state that instructional time does limit school managers to go beyond supervising curriculum; school managers do not outsource knowledge for curriculum supervision after hours in order for effective curriculum supervision using technological resources. For instance, school management can make time table/time schedule of work to be done (curriculum supervision) using EdTech with advanced planning, organising, and implementation in order to achieve the objectives of the curriculum supervision using EdTech (Zafarullah et al., 2016). This suggests that school managers should draw from knowledge perception if they want to extend school managers' knowledge and efficiency. In other words, the school managers can accomplish the set objectives if the instructional time has been utilised fruitfully. As a result, that can serve as an indication that product procedure is highly observed during curriculum supervision using EdTech.

In addition, Zuma (2020) agrees with Nzimande (2019) that product procedure is about following the policy on the use of technological resources in curriculum supervision, the list of resources to use, including the appropriate disciplinary measures that can be applied for each policy contravened. Further to this, product-oriented curriculum supervision using EdTech focuses on content and the technical aspect of discipline and it can be characterised by emphasising content and ensuring that school managers know and can recite key facts about the discipline (Rich et al., 2019). Moreover, Samsudin (2016) affirms that product procedure is based on the theory that sees curriculum supervision as autonomous technological resources in curriculum supervision as a product; a logical and consistent arrangement of resources organised according to a system of rules. For instance, school managers can convene a staff meeting where ideas can be brainstormed regarding the language of communication within the

school premises. As a result, the consensus was reached that all learners should communicate in English within the school premises and learners can become fluent in English as expected by established policy (communication policy). Thus, this suggests that if the school managers draw from the knowledge perception their work can be much easier because if some policies are breached, they can refer to policy manual(s) to correct the situation. As a result, curriculum supervision using technological resources can be smoothly implemented.

### **2.3 Technological Resources used for curriculum supervision**

The term technology comes from the Greek words '*techne*' and '*logia*' but got imported into English back in 1615 where *techne*:- means art, craft, skill and where *logia* means the study of (Preethi & Vijaya, 2020). This suggests that technology has been a careful, thoughtful, systematic approach used by school managers to supervise curriculum (King & South, 2017). Further to this, Mohajan (2019) states that England is the first country where industrial-related productions have commenced. In the late 18<sup>th</sup> and at the beginning of the 19<sup>th</sup> century (1760-1840) there were enormous socio-economic changes in England collectively known as the Industrial Revolution (IR). It is called the First Industrial Revolution or simply the Industrial Revolution. Furthermore, IR was a more relentless and universal success, than the French Revolution (Heaton, 2017; Humphries, 2010). Similarly, the IR was the transition from human and animal labour technology into machinery, new chemical manufacturing and iron production processes, improved efficiency of water power, and the development of machine tools (Mohajan, 2019; Rifkin, 1996). As a result, the iron and textile industries played a central role in the IR (Makepeace & Ashton, 1948; Mohajan, 2019). In addition, Van der Kooij (2015) concurs with (Forrester, 2019) that one of the great technological advances came in 1712 with an invention of a steam engine by an Englishman blacksmith, Thomas Newcomen (1664-1729).

Furthermore, Mokyr and Strotz (1998) declare that the second IR is usually dated between 1870 and 1914, although a number of its characteristic events can be dated to the 1850s. The latter studies further assert that it is, however, clear that the rapid rate of pathbreaking inventions (macro inventions) slowed down after 1825 and picked up steam again in the last third of the century. This says little about the rate of technological progress as commonly defined in terms of productivity increase and improvements in product quality, which depends much more on the smaller, cumulative, anonymous changes known as micro inventions. Yet

great pathbreaking in energy, materials, chemicals, and medicine described below were crucial not because they had a huge impact on production, but because they increased the effectiveness of research and development in micro inventive activity (Mokyr & Strotz, 1998). Eventually, such activity runs into diminishing marginal product, unless a breakthrough opens new horizons (Chatzis, 2009).

Moreover, Layton Jr (1974) stressed that technology is knowledge. Further to this, technology is modern economic growth (Rostow, 1959). However, Teece (1977) and Bercovitz and Feldman (2006) argue that it depends on the growth of useful knowledge. Yet as knowledge, technology differs from the knowledge of nature we think of as science, geography, or a more pragmatic knowledge of natural phenomena (Bercovitz & Feldman, 2006). Likewise, Barras (1990) and Hawken et al. (2013) argue that the part of the second IR worth stressing is the changing nature of the organisation of the product. In addition, the consequence of changing production technology was the rise of technological systems (Carlsson & Stankiewicz, 1991; Hughes, 2012). As a result, the most important developments in technology during the second IR were steel, chemical, electricity, transportation, production engineering, agriculture and food processing, other manufacturing sectors (sewing machine, and mopping-up-operation), household technology, and human welfare (Mokyr & Strotz, 1998).

According to Mohajan (2019) and Mohajan (2021), the third IR began in the 1950s, which is considered as the move from mechanical and analogue electronic technology to digital electronics. The latter studies further state that nano, bio, and IT technologies, 3D printing, artificial intelligence, robotics, etc. are the biggest drivers of the third IR. In addition, during the first IR & second IR only Western Europe and the USA were developed but during the third IR, the world became about ten times wealthier, and development spread across almost every part of the world (Mohajan, 2021; Turner, 2021). The latter studies further articulate that major modern inventions happened in the third IR such as economic development, development of transportation, development of 3D printing, robotics technologies, fab lab, etc are extraordinary activities during the third IR. Eventually, in the third IR, the standard of living and life expectancy of every nation has increased higher than that of the first IR and second IR (Friedman, 2017; Kinsella & Phillips, 2005). Nevertheless, Mohajan (2021) and Taalbi (2019) agree that the third IR also has negative impacts such as air pollution, biodiversity reduction, water pollution, habitat destruction, greenhouse gas emission, global warming, and climate change.

Furthermore, the fourth IR, a term coined by Klaus Schwab, founder and executive chairman of the World Economic Forum, describes a world where individuals move between digital domains and offline reality with the use of connected technology to enable and manage their lives (Xu et al., 2018). The latter studies further state that the fourth IR is building on the third IR, the digital revolution that occurred since the middle of the last century. Moreover, Balkaran (2017) and Ocholla and Ocholla (2020) concur that the fourth IR is characterised by a fusion of technologies that blur the lines between the physical, digital, and biological spheres. Further to this, Erisman and Parker (2019) state the advantages of fourth IR that can shape the future through its impact on government and business and it has the potential to reduce barriers between inventors and the market due to technologies such as 3D printing for photocopying. For example, school managers can use rapid prototyping techniques to analyse the results after a school summative assessment has been done, like using graphical analysis or numerical analysis. However, Xu et al. (2018) assert the challenges of the fourth IR as it can yield greater inequality, particularly in its potential to disrupt quality curriculum supervision. For instance, if the country is experiencing load-shedding, the e-submissions could be impossible.

According to George and George (2020), the fifth IR can see the transformation of the manufacturing sector that can ignite the industrial revolution. In addition, the fifth IR should ideally be the evolution of the modern manufacturing process in order to allow school managers and machines to perform hand-in-hand, combining the unique, cognitive abilities of school managers and the accurate, technical expertise of robots to bring in an innovative culture of the school. Furthermore, Japan describes the fifth IR (5.0) as **SOCIETY 5.0; a HUMAN TOUCH** revolution (George & George, 2020). Moreover, industry 5.0 can solve the need for personalisation as well as mass customisation of products (EdTech) for school managers (Martins, 2016). The latter study further states that the fifth IR could be beneficial for the school managers in two different ways namely, upskilling and offering value-added skills/competency (functional competency) during the curriculum supervision process. For example, supervisors/school managers can display/project data using the internet forum/digital platforms and virtual reality to execute curriculum supervision duties such as post-moderation assessment scripts before capture. However, Funk (1999) also declares the critiques of technology as having developed a dynamic of its own and passed out of human control. Similarly, Postman (2011) observes that technology has displaced traditional culture, to great harm. The later study further asserts that most warnings go unheeded by the average person and seem to have a little

dampening effect on the technological process. This suggests that school managers should be driven by skill perception in order to be equipped with all necessary technological skills so that can be proficient to supervise curriculum effectively, since the technology has improved.

According to Wahab et al. (2012), technology consists of two primary components namely, physical components which comprise items such as products, tooling, equipment, blueprints, techniques, and processes and the information component which consists of know-how in supervision, marketing, production, quality control, reliability, skilled labour, and functional areas. The latter studies, further view technology as ‘configuration’, observing that the transfer object (the technology) relies on a subjectively determined but specifiable set of processes and products. This suggests that school managers should be influenced by skill perception in order to ensure they acquire a necessary orientation about the uses of technology parts and how the technology systems are used to supervise curriculum. Moreover, by scrutinising the technology definition, two basic components can be identified namely, ‘knowledge’ or technique and ‘doing things’ (Kumar et al., 2012). The latter study further declares that technology is always connected with obtaining certain results. In addition, Afriyie (1988) concurs with Wahab et al. (2012) in defining technology as encompassing the basic knowledge sub-system, the technical system (software) and the capital-embodied technology (hardware). Thus, this suggests that technology is defined as resources used by school managers to supervise curriculum and require their knowledge, skills, and attitudes in order to be used effectively to accomplish the curriculum goals. In other words, technological resources have transformed the day-to-day lives of school managers and the way they work. It has an important role to play in curriculum supervision and gives school managers’ perception of curriculum supervision for raising achievements and improving curriculum supervision objectives (Aulia et al., 2018). Moreover, the latter study further asserts that technological resources offer new ways of supervising curriculum and offer school managers new ways of interacting with perceptions and gaining knowledge, skills, and attitudes. Furthermore, (Khoza, 2012) declares that technological resources used in curriculum supervision comprise hardware (HW), software (SW), and ideological-ware (IW).

### **2.3.1 Hardware Resources**

As a component of Technology in Education (TIE), hardware resources refer to any type of machine or tool implemented for curriculum supervision using technological supervision

(Khoza, 2012). Even so, in curriculum supervision using technological resources, hardware resources are used in both face-to-face and online platforms depending on the nature of curriculum supervision (Budden, 2016; Mpungose, 2020a). Further to this, Ratheeswari (2018) declares that the use of technological resources in curriculum supervision is rife and accumulates in fields of education that requires school managers who are well-equipped with skills, attitudes, and knowledge. Moreover, Khoza (2012) states that school managers have recognised that this is the way forward in addressing progressive education and how they want to supervise curriculum in this modern era. Furthermore, Budden (2016) alludes that school managers use computers and laptops to supervise curriculum and store records and information. This suggests that school managers should be perceived as manipulated by knowledge perception in order to ensure that they use the relevant hardware resources or any updated technological resources when supervising the curriculum. Moreover, the study conducted by Shen and Ho (2020) concurs with the study conducted by Nocar et al. (2016) which investigated the effective use of hardware resources by school managers when supervising the curriculum. The findings of the study reveal that the hardware resources were effectively and efficiently used by school managers and made their work easy when supervising the curriculum. This suggests that the school managers were perceived as driven by knowledge perception. In other words, the school managers were influenced by the school policies when supervising the curriculum because they were well-trained (competent) in using and handling hardware resources such as desktop computers, laptops, data projectors, and others.

Moreover, see the quantitative study conducted in Australia by Benham et al. (2017) seeking to understand the school managers' perceptions of who uses physical computing hardware resources to supervise curriculum. The findings of the study showed that physical computing hardware resources are an attractive option due to their perceived benefits for school managers and the digital technologies for curriculum supervision. This indicates that the school managers were driven by attitude perception because they were at a suitable standard to supervise the curriculum using EdTech. In other words, for the digital technologies in curriculum supervision to be effective, the school managers should have ideal skills (such as writing, and blogging) to supervise curriculum (Benham et al., 2017). In addition, the later studies further resonate with the findings from the study conducted by Munje and Jita (2020) in the Free State, which revealed that curriculum supervision using physical computing hardware resources is likely to increase the school throughput and functionality.

### **2.3.1.1 Traditional hardware resources of a computer**

The 20<sup>th</sup> century saw the birth of the computer, one of the most important tools widely used today (Mugivane, 2014). Moreover, Loureiro (Loureiro et al., 2010) assert that computers are used for communication, curriculum supervision, and research. As such, the 21<sup>st</sup> century is referred to as the digital age. According to Mugivane (2014), the computer is an electronic device that accepts user input (data) and processes it under the influence of a set of instructions referred to as programs to produce the desired output generally referred to as information. Further to this, data are the raw facts that may not make much meaning to the user (school managers), programs are sets of instructions that instruct a computer what to do, and information is result after data has been processed. In addition, Casey (2015) concurs with (Johansson, 2015) that there are four basic types of computer parts, namely: input devices, parts of the computer that allow information that allow school managers to capture information/data to be the given to the computer like keyboard, or mouse,

Storage devices are hardware resources that hold information. The primary storage device is the computer's memory called RAM (random access memory). It remembers everything that is read, input, or output. But because the computer's memory is in a temporary area – it forgets everything when turned off – it must have another place to store information permanently. This secondary storage device is usually a disk.

The processing device is the part of the computer that processes and controls the flow of information, it does the work. The one part of the computer that handles this job is the central processing unit or CPU. Output devices are parts of the computer that give out information generated by the computer, like a monitor, printer, or speaker. This suggests that these hardware resources can assist school managers to store data for curriculum supervision. For example, to keep the record of the curriculum supervised and reports made after curriculum supervision.

In other words, the use of EdTech can be determined by the policy which speaks a lot to what resources should be used to supervise curriculum. Moreover, Knipping (2005) declares school managers can use electronic chalkboards, mobile phones, and laptops as modern hardware resources to supervise the curriculum.

### **2.3.1.1.1 Mobile phone**

According to Hashemi et al. (2011), mobile curriculum supervision can be broadly defined as the exploration of ubiquitous handheld EdTech, together with wireless and mobile phone networks, to facilitate, support, enhance, and extend the reach of curriculum supervision. The latter studies further state that mobile curriculum supervision can take place in any location, at any time, including traditional curriculum supervision environments such as in schools, in community locations and in transit. In addition, mobile curriculum supervision using EdTech includes mobile phones, smartphones, MP3/MP4 players (e.g., iPod), handheld gaming handheld devices (e.g., Sony PSP, Nintendo DS), and mini notebooks or netbooks. Furthermore, supervisees can interact with each other and with the supervisors instead of hiding behind large monitors; it is much easier to accommodate several mobile devices in a school than several desktop computers, and tablets holding notes and e-books are lighter and less bulky than bags full of files and papers (Hashemi et al., 2011).

Similarly, the descriptive study conducted by AlShareef (2018) aims to recognise the importance of mobile phones in supporting curriculum supervision by school managers. The findings of the study showed that school managers recommended the use of a mobile phone in curriculum supervision and urged supervisees to make use of it to support curriculum supervision because they are portable, easy to carry, better for social interaction, strengthen cooperation between school managers and colleagues in the same organisation, individuality, the development of active curriculum supervision experiences, and improves computer literacy, retention of information, effectiveness and modernity, accuracy and comprehensiveness, time-saving and costs. Thus, this suggests that school managers should be perceived as driven by knowledge perception in order to ensure that they use relevant EdTech (devices) stipulated by the policy documents. For instance, school managers can encourage the supervisees to use Chrome/Firefox to download and save policies and retrieve policies to refresh their minds like the promotion policy which says progression in Grades 10-12 does not guarantee the final certification of a learner in Grade 12 (Mestry & Grobler, 2004)

### **2.3.1.1.2 Electronic chalkboards**

According to Knipping (2005), electronic chalkboards can provide a shared view for school managers and supervisees. The board ensures that information stays available, providing context for talk and discussion. In addition, supervisees see how ideas are developed rather than being overwhelmed with the results, which means supervisees are helped to follow the conceptual process. For example, school managers can use electronic chalkboards to display the planning function of the school manager and governing (legislative) frameworks for curriculum supervision such as the National Education Policy Act 27 of 1996 (Section 3 (4) (1) which identifies the roles of educators (supervisees) which stipulates the curriculum supervision related activities which should be performed by each supervisee such as learning mediator, interpreter and designer of learning programmes and material, leader, administrator and supervisor, scholar, researcher and life longer learner, community, citizenship and pastoral role, assessor and learning area/subject/discipline/ phase specialist. Thus, this suggests that school managers should be influenced by knowledge perception so that can have a clear vision of what they should supervise during the curriculum supervision process.

#### **2.3.1.1.3 Computer laptops**

A computer laptop is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store information for future use (Vermaat et al., 2017). Moreover, a quasi-experimental design was employed in a study conducted in New York City by Mouza Mouza (2008) examining the implementation and outcomes of the laptops programme initiative for curriculum supervision. In addition, the results of the study revealed that in the hands of well-prepared school managers, laptops enabled disadvantaged supervisees to engage in a powerful curriculum supervision experience. The findings of the study also indicated that laptop integration created enhanced motivation and engagement with schoolwork, influenced school interaction, empowered supervisees, and that laptop programmes produced academic gains in curriculum supervision within the laptops group. This suggests that school managers were driven by a knowledge attitude because they unpacked the policy document well to the supervisees, as a result, the supervisees responded accordingly towards the implementation laptops programme. In other words, technology was used effectively and critically, showing responsibility towards the curriculum supervision (Chisholm, 2003).

Likewise, the descriptive survey study conducted by Ojo and Adu (2018) in Eastern Cape Province (South Africa) investigated the effectiveness of laptops in curriculum supervision. The findings of the study revealed that laptops helped school managers communicate effectively with supervisees in a unique way of understanding that facilitates curriculum supervision. In other words, the school managers were perceived as influenced by knowledge perception because the policy articulates that school managers should be influenced by the Department of Basic Education to promote the quality and preparation of teachers in critical tasks such as application of technology in curriculum supervision (Olivier & Kruger, 2022).

### **2.3.2 Software resources**

Software resources are termed as any material that is configured for the hardware resources to display information or communicate curriculum supervision using technological resources (Budden, 2016; Khoza, 2013). Moreover, the study conducted by Chakraborty (2020) in South Asia explored the use of technological resources and software in curriculum supervision. The study findings reveal software can motivate school managers to study courses that are otherwise considered to be difficult and software in schools can help school managers to learn better strategies and perform to their utmost best in their practices. Similarly, the qualitative study conducted by Sahin and Özenç (2021) explores educational software in curriculum supervision. The findings showed that educational software provides an advantage in terms of concretisation of curriculum supervision, differentiation of activities, opportunities to apply what is supervised, addressing many different functions in school managers, and motivating and supporting school managers. This suggests that school managers should draw from skill perception for curriculum supervision using technological resources to make life easier when performing their duties such as analysing the results to parents at the end of each term/quarter. In other words, school managers, by acquiring the necessary skills from society, can understand how to use an overhead projector and slides and hold meetings online and it offers school managers a more convenient and effective setup for applying newly developed software for curriculum supervision. Furthermore, the study conducted by Njoku (2015) aims to assist the Department of Basic Education (DBE) school managers in knowing and being able to deploy certain software resources towards shifting face-to-face curriculum supervision to online/curriculum supervision by using EdTech/software resources for increased quality of curriculum supervision. The findings of the study highlight many benefits of integrating EdTech into curriculum supervision, as proved by projects in DBE. Moreover, the study then

lists the EdTech that can be used successfully in the DBE, explains what they are, shows how, and evidence of use. They include Blogs, wikis, e-mail, social networking websites, mobile sites, social bookmarking websites, mobile phones, presentation software, digital cameras, instant messaging, and online community/internet forum.

### **2.3.2.1 Instant messaging (IM)**

Instant messaging (commonly called chatting) “is a form of real-time, direct, text-based communication between two or more people using personal computers or other devices, such as mobile phones” (Lauricella & Kay, 2013). Further to this, the latter studies assert that the user’s text is conveyed on a network, such as the Internet. Yahoo Messenger is one of the most used IM applications (Khan et al., 2021). Likewise, there are also America Online (AOL) and Windows Live Messenger. Several other free e-mail providers, integrated IM facility into their e-mail services (for example, Google Hangout, formerly called Google Talk, which works with Google Mail---Gmail). One can log into one’s e-mail account and chat with contacts right from there. Moreover, Skype is another IM application. It transmits text, voice, and video making it possible to see, speak to, and be heard and seen by others in real time (Khan et al., 2021). IM is being used increasingly by school managers for curriculum supervision (Chen Wang & Morgan, 2008). Thus, this suggests that school managers should be perceived as driven by skill perception. In other words, IM has become such an integral part of school managers’ lives that many schools are working to move it beyond the social sphere into curriculum supervision using EdTech (Lauricella & Kay, 2013). Through IM/WhatsApp school managers can meet with their supervisees for interactive sessions and conduct seminars and conferences for curriculum supervision using IM. Furthermore, one outstanding benefit is that supervisees who travel out of schools for reasonable cause and can miss such seminars when held in physical staffroom/boardroom are allowed to participate (Benham et al., 2017).

### **2.3.3.1 Digital camera**

Digital cameras are cameras that store and export still or motion pictures to PC or the internet in electronic form (Lukac, 2018). The latter study further declares that digital cameras can be standalone or come as a feature of a mobile device, such as mobile phones and iPads. Moreover, many standalone cameras are pocket-sized, which makes them easy to carry and use anytime and anywhere (Filippa et al., 2018). Furthermore, the latter studies advanced that digital

cameras can be used to take still photographs and videos that aid understanding and enhance curriculum supervision. In addition, supervisees can be assigned to take such photographs and videos as related to their duties and write notes about them. This places supervisees as collaborators with their supervisors, as it enables each supervisee to contextualise their curriculum supervision experiences. For instance, the school manager can use the Note Look Application to conduct a social sciences teacher workshop using a secure digital card inserted in a digital camera and display photos of planets on a whiteboard and how are located. Thus, this suggests that school managers should be driven by knowledge perception. In other words, school managers should familiarise themselves with education prescript/policies which dictate how and when to use such devices as digital cameras, like adjusting settings for a digital camera like zooming or taking normal photograph in order to allow the accomplishment of curriculum supervision goals.

### **2.3.2.2 Presentation Software**

Presentation is a method of using a computer to prepare and deliver information or knowledge in an outline form, on electronic boards or slates called slides, in a fashion intended to attract and sustain the attention of the user (school manager) or audience (supervisees) and to make easy comprehension and assimilation (Kominsky, 2019). Further to this, computer programs used for presentation are called presentation software. The latter study further declares that the most popular of these, in the commercial or proprietary category, is Microsoft Office PowerPoint. Likewise, Müller-Prove (2007) states that a very good free and open source variety, fast winning universal appeal, is OpenOffice.org impress which can be also used by school managers for curriculum supervision. The latter study further declares that they are usually used for creating presentations for meetings, conferences, and the Internet. This suggests that school managers should draw from skill perception when supervising curriculum using such EdTech in order to use presentation software in different ways such as to organise school meetings. In other words, school managers should consult the society members with knowhow/knowledge of OpenOffice.org in order to ensure that their practices produce desired outcomes. For instance, the school manager can use presentation software in the form of slides to capacitate supervisees on different types of leave measures entitled to teachers employed at school.

### **2.3.2.3 Online community or Internet forum**

Online community or internet forum services allow people to form online groups and collectively create and maintain their own websites, often hosted free of charge on the service providers' internet domains (Biriyai & Thomas, 2014). The latter studies further assert that the famous online encyclopaedia, *Wikipedia*, describes it as “a virtual community that exists online and whose members enable its existence through taking part in membership ritual” (<http://en.wikipedia.org/wiki/online>). Further to this, applications that are used to create online communities are legion. They include Google Groups, Google Sites, and Yahoo Groups. Many ready-made Website designs (called templates) are provided by these applications to suit various group purposes, including education. Users (school managers) only need to select the template that relates to their group's nature and replace the content with theirs, following the steps provided. For example, the school manager can create an internet forum/online community and encourage the supervisees to join using free mode in order to discuss possible strategies to minimise students' late coming.

### **2.3.2.4 Online chat room**

An online chat room is a type of online or virtual community. It allows people to communicate with one another at the same time (Yang et al., 2021). It happens because the room is on the internet, the people must connect to the internet before they can enter it. Furthermore, questions can be asked and answered immediately, no matter the location of the questioners and the respondents. Discussants in a chat room must have chosen usernames and passwords with which they logged in. This means school managers should draw from skill perception. This means that an online chat room can be created and restricted to selected school managers, and this character makes it a very useful tool with which school managers and supervisees can draw maximum gain. In addition, communication in a chat room is usually by typing and sending text (Jucker & Dürscheid, 2012). This suggests that school managers should be influenced by skill perception when supervising curriculum using EdTech in order to ensure that they get necessary assistance in terms of connectivity. For instance, a school manager can organise a staff meeting using a chatroom by sending staff members a link or meeting ID through e-mail to access meeting relating the discussion of principles/requirements for admission of new learners in the school.

### **2.3.2.5 Social Networking Websites**

Social networking websites, otherwise known as social media or Web 2.0, are useful for curriculum supervision (Tosun, 2018). Further to this, the latter study further states that the use of social networking sites, which were driven by skill perception, could have real value over curriculum supervision sessions when supervisees were away from schools as well as being able to discuss issues with other supervisees of other schools on similar phases. Likewise, the study conducted by Collin et al. (2011) explored the significant benefits associated with the use of social networking websites to supervise curriculum. The findings of the study showed that the use of social networking websites can support the development of curriculum supervision, the creation and sharing of content on services such as Myspace, have been seen to increase the supervisees 'technical literacy' as they draw from and re-use media in appropriate ways for communication, and self-expression during the curriculum supervision process. This suggests that school managers should draw from skill perception. In other words, school managers should rely on their colleagues in order to benefit/master relevant skills for using social networking websites. In addition, school managers can use Facebook to ask questions and receive answers during the curriculum supervision process. Hard questions, the supervisees answers have not been able to get answers to or content they want more ideas/information on can be raised (Collin et al., 2011). According to <http://www.facebook.com>, in its note on "How Questions Work," Facebook's "Questions" feature "is designed so that anyone on Facebook can help you find the answer (to a question)." For example, when you ask a question and your friends answer or follow, their friends can see and answer it, too, and so on. For instance, the school manager can create a school WhatsApp group/Facebook group and become a group admin whereby they can add all staff members for the purpose of discussing issues related to curriculum supervision, such as assessment and the recording the attainment of learners taught. This suggests that school managers should be influenced by skill perception during curriculum supervision. In other words, school managers should develop/establish healthy interpersonal relationships in order to maintain and sustain sound human relationships.

### **2.3.2.6 Social bookmarking websites**

Social bookmarking websites are a method for internet users to organise, store, manage, and search for bookmarks of resources online (Al Rasheed & Berri, 2014). The latter studies further

declare that bookmarks are merely referencing the resources; the school managers do not share the software resources themselves. Moreover, social bookmarking can be linked to compiling and using bibliographies, which many school managers and supervisees are conversant with. Similarly, these descriptions may be added to the bookmarks, just like annotations added to a bibliography. Likewise, Al Rasheed and Berri (2014) state that these descriptions help school managers understand the content of the resource without first needing to download it for themselves. Furthermore, the latter studies further state that such descriptions may be free text comments, votes in favour of or against its quality, or tags (keywords) that collectively become social tagging, “the process by which school managers add related terms (called metadata) in a form of keywords to shared content” to be supervised. In addition, in a social bookmarking system school managers save links to web pages that they want to remember and or share. These bookmarks are usually public and can be saved privately or shared only with a group or groups. School managers are allowed to view the bookmarks and can usually view them chronologically, by tags, or via a search engine. According to Al Rasheed and Berri (2014), social bookmarking could be useful as a way to access a consolidated set of bookmarks from various computers and organise a large number of bookmarks with contacts. Eventually, two good and popular social bookmarking sites are known as “Delicious” ([http//www.delicious.com](http://www.delicious.com)) and Facebook ([http//www.facebook.com](http://www.facebook.com)). As a result, school managers and supervisees can use Delicious to compile, store, share, search for, and use lists of books, journals, and papers, as well as videos, speeches, pictures, and other media on specific topics for curriculum supervision. For example, the school manager can select a social bookmarking site (Facebook) upload links and bookmark pages ([chrome.google.com> webstore> detail](chrome.google.com/webstore)), connect to social media (<m.facebook.com>), tag the links (type@ in their post to see the options available, the school manager can choose all staff members that have been tagged in the post to notify and post the subject to be discussed like, teachers engaging in class as per workload of the relevant post level and needs of the school and supervisees can be encouraged to participate by airing their ideas (in a form comments) during the discussion process.

Moreover, Twitter is one example of a social bookmarking website and one finds/describes Twitter as a website which offers both social networking and micro-blogging services (Park & Kaye, 2017). The latter studies further state that micro-blogs are a form of a blog that allows typically smaller content (than a blog) such as short sentences, individual images, or video links. Twitter has been used for a variety of purposes in many different industries, such as

education specifically for curriculum supervision. Moreover, short text messages displayed on a Twitter school manager profile page are called tweets (Park & Kaye, 2017). Further to this, if school managers use Twitter without changing its settings, tweets can be seen by all supervisees who visit, but senders of tweets can change settings to keep them visible only to Twitter users (supervisees) who subscribe to their tweets, these subscribers are called followers. Likewise, when school managers send tweets and supervisees follow along with other followers, there is a pool of ideas that enhance curriculum supervision. When a supervisee sends tweets, the impact is similar (Park & Kaye, 2017). Additionally, the use of this EdTech is a skill of its own. This suggests school managers should be influenced by skill perception so that supervisees can adopt and enjoy the use of EdTech for living and socialisation.

This suggests that school managers should draw from skill perception if they want to use Delicious effectively during the curriculum supervision process.

### **2.3.2.7 Web blog**

A web blog, usually shortened to a blog, is “a frequently updated, personal website featuring diary-type commentary and links to articles or other websites (Al Rasheed & Berri, 2014). It is a term used to describe websites that maintain an ongoing chronicle of information. Given the personal perspective presented on blogs, they often generate ongoing discourse and a strong sense of community. Moreover, blogs provide diverse, alternative sources of information for school managers supervising curriculum. In addition, Al-Kindi and Al-Suqri (2017) state that blogs are a tool that can be used by school managers and supervisees for a wide range of curriculum supervision purposes. The latter studies further declare that school managers or supervisees can create a blog and use it to share and generate immense information and knowledge on various curriculum supervision contents. School managers should try to create blogs (Instagram/Twitter) and periodically post brief articles on curriculum supervision in a style that motivates supervisees to freely express, in a “comment” section, their own opinions and findings without fear of being repudiated. Similarly, supervisees should be encouraged to search for and read blogs relevant to curriculum supervision and comment on them. Comments by other supervisees, many of whom are experts in curriculum supervision, can certainly provide more insight and help supervisees to assess their own comments. As a result, creating and using a blog is known as blogging. For instance, school managers can present/post an article that speaks of curriculum supervision such as giving proper instruction and guidelines

for timetabling and its honouring. The supervisees can be asked to comment about their perceptions regarding the topic posted using the blog platform. Thus, this suggests that school managers should be perceived as driven by skill perception so they can communicate with other colleagues and supervisees, for example using Instagram, to share ideas.

#### **2.3.2.8 Wiki**

Wiki is a website that allows its users (school managers) to create and collaboratively edit web pages using a web browser (Parker & Chao, 2007). The latter studies further affirm that the major web browsers are Microsoft Internet Explorer, Mozilla Firefox, Apple Safari, Google Chrome, and Opera. The pages are interlinked; that is, one can move from one page to another and to another. In addition, Castanier (2022) concurs with Porter (2009) in describing a wiki as essentially a database for creating, browsing, and searching through information. Moreover, the latter studies further declare that a wiki invites all users (school managers) to edit any page or create new pages within the wiki website. Wiki strongly welcomes scholarly citations, which makes it an authoritative source of knowledge (Rector, 2008). For example, school managers can use Wikipedia to encourage supervisees to search for more information regarding staff development on interaction with all stakeholders using Google Scholar, Chrome, Firefox, and others. This suggests that school managers should draw from skill perception in order to ensure they keep themselves updated in terms of connectivity and in all useful social networking in order to enhance curriculum supervision.

#### **2.3.3.2 Virtual Supervision Programme**

It is an online curriculum supervision delivery system that improves upon the traditional school environment, offering school managers and supervisees an effective curriculum supervision environment (Snoussi, 2019). Further, the latter study asserts that it is a software application used to supervise, track, report, automate, and deliver curriculum supervision developmental programmes. They can have a main office, school announcements board, whiteboards, a school manager's lounge, messaging systems like chat rooms and forums, easy-to-use tools for creating curriculum supervision plans and much more (Njoku, 2015). Likewise, a Supervision Management System can be hosted on an intranet and used to enhance the physical school experience of supervisees. In addition, a Supervision Management System can be hosted on

the internet for 100% distance curriculum supervision. It can also be used to create a blended environment that combines both distance and physical school curriculum supervision or to offer customised content for curriculum supervision, for example, Moodle software (Park & Kaye, 2017). This suggests that school managers should be influenced by skill perception in order to use Moodle effectively for curriculum supervision. In other words, school managers should ensure they are well-connected to all stakeholders that play an integral part in enhancing curriculum supervision.

### **2.3.3.3 Supervision Management System**

The supervision management system is used with online instruction (Bradley, 2021). Further to this, the latter study states that it provides school managers and supervisees with an environment that reinforces curriculum processes. In addition, the supervision management system supports inclusive curriculum supervision for academic progress with interceding structures that promote online collaborative grouping, professional training, discussion, and communing among other supervision management system users (Bradley, 2021; Jung & Huh, 2019). Likewise, Bradley (2021) declares that the supervision management system has multiple online operations and behaves as a framework to capture numerous layers of progressive curriculum supervision such as online training for implementing a Quality Management System for teachers. Similarly, the latter study further states that supervision management system functions include promoting specially designed information for capturing both learners' progress and supervisees' progress in terms of personal growth plans. Furthermore, school managers can use a supervision management system to discuss curriculum supervision techniques (file submission dates, activities expected per week per subject), including enabling profile features, guidelines for following curriculum for supervising/managing task/activities conducted, discussion boards, and resources for curriculum implementation from the Department officials. This suggests that school managers should be driven by skill perception because for this system to be fruitful an upskilled school manager is required. In other words, school managers should undergo training and use networking in order to ensure that desired outcomes are produced.

### **2.3.3.4 Video Conferencing Software**

See the quantitative study conducted by Torrato et al. (2021) in the Philippines holding a professional developmental programme for school managers using web video conferencing.

The study aimed to evaluate the use of web video conferencing and the development of school managers on sustaining curriculum supervision. The findings of the study showed that the use of web video conferencing as a mode of curriculum supervision proved successful in creating an effective curriculum supervision experience as evidenced by all school managers with their enhanced supervision skills and academic vitality. This suggests that school managers should be driven by skill perception so they can be well acquainted with the skills needed for operating/utilising the web video conferencing. In other words, school managers gain professional development as a major component to enhance their skills and competencies (Torrato et al., 2021). Moreover, video conferencing allows supervisees and school managers to interact in real-time, similar to an interaction that would occur in a traditional school environment (Basko & Hartman, 2017). Furthermore, the latter study further concurs with Rahimi et al. (2022) that having visual contact with the school manager (supervisor) allows supervisees to read facial expressions and hear the tone of voice. Further to this, communicating with supervisors regularly and through multiple formats increases a sense of school manager presence for supervisors. For example, a school manager can use Zoom Meeting/Microsoft Teams to remind the supervisees about the submission date for mark schedule and the supervisees are able to interpret the school managers' tone (seriousness of the message and the compliance) and the consequences, if they fail to comply. This suggests that school managers should be driven by skill perception so they can use gestures (like frowns/smile) to mean different situations using Zoom Meeting/Microsoft Teams.

### **2.3.3. Ideological-ware resource**

The word 'ideologie' meaning 'the science of ideas' was formulated by Sternhell (1996) from the work of the French philosopher Destutt De Tracy (1784-1836). The researcher understands the concepts of ideology as representing a framework of ideas; while cultural activity theory (CHAT) adopts the concept of conceptual resources (Mabuto, 2019). Similarly, Makumane and Khoza (2020) affirm that ideological-ware resources exist in the mind, and school managers would have to become aware of ideological-ware resources to help with the identification of hardware and software resources that promote effective curriculum supervision using technological resources. In addition, ideological-ware resources are the performing resources that school managers use to identify and use relevant hardware and software resources for curriculum supervision using technological resources (Kisaka, 2015). Likewise, Mabuto (2019), Khoza (2015), and Amory (2010) argue that curriculum supervision

using technological resources is not about resources, but is instead the ideology that informs the technological resources. This suggests that school managers should be driven by attitude perception in order to use the relevant pedagogies that can ensure that curriculum supervision using technological resources is effectively enacted.

Furthermore, the research conducted by Mnguni (2018) in Gauteng, South Africa. The study explored the curriculum supervision ideology recommended by school managers when using technological resources. The findings of the study pointed out that school managers are significant agents of curriculum supervision when using technological resources and their preparedness to adopt technological resources for curriculum supervision is crucial in shaping the success or failure of curriculum supervision. In other words, this preparedness improves school managers' actions via planned training as suggested by (Lee & Yin, 2011). Considering this, school managers-centred ideology and service-centred ideology for curriculum supervision using technological resources is paramount. This suggests that school managers need to be influenced by attitude perception during the curriculum supervision process when using technological resources. In other words, the school managers who acquired the attitude perception are able to identify their identity and change that attitude into attitude perception (Mnguni, 2018).

In addition, see the qualitative study conducted by Khoza (2018) in South Africa aiming to explore and understand the school managers' perceptions on the use of ideological-ware software resources to supervise curriculum. The findings of the study concur with the findings of the qualitative study conducted by Moodley (2013) in South Africa to explore the school managers' perception of the use of ideological-ware resources which revealed that, school managers understood/learned new strategies for supervising curriculum through their perceptions on their use of ideological-ware resources and that ideological-ware resources and critical perception are the main ingredients to ensuring the success of the implementation of curriculum supervision using EdTech. This suggests that school managers should be influenced by attitude perception because the school managers have to consider their self-identity, love, passion, age, race, and other factors in order to ensure the successful implementation of curriculum supervision using EdTech.

Moreover, Fomunyam (2018) concurs with Khoza (2013) that ideological-ware resource as already articulated as a vital resource in the curriculum supervision process which must be

utilised with care to ensure maximum impact. The latter studies further assert that the ideological-ware resource is a vital resource with great potential in the education sphere especially in this golden age of education where curriculum supervision using EdTech is the talk of the town and creation of attitude perception. This suggests that school managers should be influenced by attitude perception because attitude perception is instrumental/influential to the implementation of using EdTech for curriculum supervision. After all, attitude perception is the custodian of all curriculum and assessment policy statements (CAPS) and should be consulted before enacting curriculum supervision. In other words, school managers must consider certain factors (self-identity & personal choices/needs) before using EdTech for the curriculum supervision process.

Furthermore, see the qualitative case study conducted by Oliveira and Pombo (2017) in Portugal analysing the curriculum developed by curriculum supervision strategies with the use of EdTech by school managers. The study revealed that the following innovative pedagogical formats such as collaborative work, flipped school, and research-based curriculum supervision were encouraged. Further to this, the latter studies declare that these curriculum supervision strategies were mediated by technologies in the EduLab Model. The EduLab model is a new educational model that integrates technologies in an educational context comprising fully equipped infrastructure with attractive and easy-to-use technological resources (Oliveira & Pombo, 2017). Likewise, the recognition of the potential of technology in an educational context has led to, in recent years, Portuguese schools implementing various initiatives and programmes to support the integration of technology in the curriculum supervision process (Oliveira & Pombo, 2018). Moreover, see the results of the case study conducted by Ruismäki et al. (2015) in Minerva Plaza (Poland) exploring how the new space has been used by the school managers and supervisees and to form a good overall picture of the strengths and weaknesses of the space as a technology-rich curriculum supervision environment. The findings of the study revealed that the school managers would dare to come to work (supervise curriculum) there and take advantage of what the space has to offer. However, findings also revealed that school managers before adopting new spaces and new method/strategies for curriculum supervision take time. This suggests that school managers should be motivated by attitude perception so they can be at liberty to make a choice of the curriculum supervision strategy that suits their needs/love/passion and can lead them to CAPS goals.

Furthermore, in 2005, the Portuguese Ministry of Education established the Equipa de Missao Computadores, Redes e Internet and Escola which had as its purpose to design, develop, implement, and evaluate mobilising and integrative initiatives in the use of computers, networks and internet in schools for the curriculum supervision processes (Oliveira & Pombo, 2017). In addition, in 2007, the Plano Tecnologico de Educacao was implemented with the basic goals to: ensure technological equipment of schools, support the development of digital content, focus on school managers/supervisees training on the use of EdTech in curriculum supervision, and enhance the dissemination of good practices (Tripa & Chagas, 2000). The latter studies further assert that a new educational model that, with technology, seeks to respond to the needs and interests of future generations, is the EduLab model. The EduLab model, whose name comes from the combination of the words education and laboratory, intends to guide a new model for EdTech integration in educational contexts. In addition, to provide EdTech, this model predicts school managers' training and monitoring, to ensure that the use of EdTech is made in a pedagogical and motivational way, with advantages for the curriculum supervision process.

Furthermore, the EduLabs constitute an experimental curriculum supervision ecosystem, equipped with EdTech to be used pedagogically, seeking to promote innovation in school managers' training and integration of EdTech in curriculum supervision. For example, the school manager can use EduLab to capacitate supervisees on coding and robotics and the school manager can use a laptop, interactive whiteboard, and projector to display crucial information and the roles of each supervisee for effective implementation. Both school managers and supervisees involved in the project have a laptop/tablet with integrated textbooks (in digital format) having access to an Open Educational Resource platform (OER), e-curriculum supervision software (Mythware), and the Internet (Oliveira & Pombo, 2017).



**Figure 2.11 Available resources in the EduLab model (adapted from E-Xample, 2014)**

Moreover, BYOD (bring your own device) increases the opportunities for curriculum supervision to facilitate the development of 21<sup>st</sup>-century skill perception, as well as soft skills, such as communication, collaboration, and creativity (Hristova, 2015). Further to this, the latter study declares that BYOD makes curriculum supervision more active and engaging and promotes the development of creative, intellectual, conceptual, and analytical thinking, as well as understanding and connecting ideas (Janssen & Phillipson, 2015). Furthermore, the implementation of BYOD improves the curriculum supervision quality since it allows school managers to provide differentiated curriculum supervision experiences/perceptions that meet supervisees' specific needs and curriculum supervision styles. In addition, on the assumption that digital content use and access to applications and curriculum supervision platforms promote an interactive and motivating curriculum supervision environment, the EduLab model recommends that EdTech be associated with curriculum supervision formats and appropriate actions to provide a more efficient and dynamic curriculum supervision process. With the EduLabs projects it is intended to develop a work of continuous improvement in the relation between pedagogy and EdTech, by assessing their impact (Janssen & Phillipson, 2015). Thus, this suggests that school managers should be driven by attitude perception to ensure that their needs are addressed in terms of using appropriate EdTech and pedagogical practices.

Furthermore, Janssen and Phillipson (2015) underline that the curriculum supervision styles of school managers, the kind of skills (perception), and competencies to be developed, the content and the available EdTech are factors that may determine the success of curriculum supervision

implementation strategies. In other word, school managers should be driven by attitude perception to ensure that they employ the strategy they enjoy, defines their self-identity/capabilities, and aligns with their competencies. For instance, a school manager can choose any device (laptop/ tablet/iPad/smartphone/Chromebook that they are familiar with and allow the supervisees to use any devices during the workshop.

In addition, Rae et al. (2017) support Crompton and Traxler (2018) by describing the flipped school environment as a way of supervising curriculum that reverses the usual practice where content workshop/s are delivered to supervisees in school and supervisees complete post-tests related to that particular workshop (leading school into the future through the use of EdTech) to develop their understanding. In a flipped school, instructional/content workshop is delivered to supervisees usually online (E.G., short video clips), outside of school time. Further to this, the workshop time is then used to workshop material through discussion, working exercises, or projects. Thus, this suggests that school managers should be influenced by attitude perception to allow the supervisees to remind themselves at any time they wish. In other words, the supervisees can select a convenient time to watch a video clip about a content workshop so that they can meet the demands of the curriculum supervision.

Furthermore, Souto-Otero et al. (2008) concur with Marcus-Quinn and Diggins (2013) in highlighting the fact that EdTech allows and extends the curriculum supervision context beyond school hours. The latter studies further state that EdTech allows all school managers to capacitate supervisees anywhere, anytime, through any device, with the support of anyone. In addition, Morales (2020) & Oliveira and Pombo (2017) claim that EdTech-mediated curriculum supervision is supervisees-centred and promotes the development of attitude perception to academic and/or knowledge path. This suggests that school managers should be driven by attitude perception to ensure that all supervisees are accommodated with their different devices. In other words, school managers should allow their supervisees to have access to EdTech anywhere, anytime to assist/develop each other if there is a lack of clarity to understand what was discussed during developmental session.

## **2.4 Strategies for Curriculum Supervision**

Curriculum supervision is an activity allocated to school managers that prepares individuals to superintend instructional and support personnel at the school building, facility, or staff level

(Jonjo & Jonjo, 2019). Moreover, the latter studies further assert that curriculum supervision includes instruction in the principles of staffing and organisation and the management of learning activity, personnel relations, and administrative duties related to departmental unit/management and specific applications to various educational settings and curricula. Furthermore, see the quantitative study conducted by Atwa et al. (2022) in Arab. The study aimed to explore the perceptions of school managers and their preferences for the mode of curriculum supervision using technological resources during the pandemic. As such, various studies reveal that school managers can employ three strategies to supervise curriculum namely, face-to-face, online, and blended (Asghar et al., 2022; Atwa et al., 2021; Jonjo & Jonjo, 2017).

#### **2.4.1 Face-to-face**

Face-to-face curriculum supervision is an instructional method where content knowledge and curriculum supervision material (EdTech) are supervised in person by a group of supervisees (Gherheş et al., 2021; Thompson & McDowell, 2019). Further to this, the latter studies affirm that face-to-face curriculum supervision allows for live interaction between a school manager and supervisee, and it is the most traditional type of supervising curriculum. In addition, supervisees benefit from a greater level of interaction with their fellow supervisees as well (Thompson & McDowell, 2019). Similarly, in face-to-face curriculum supervision, supervisees are held accountable for their progress at the school's/staff's specific meeting date and time (Shyr & Chen, 2018). Furthermore, Fisher and Frey (2021) agree with Hodges et al. (2020) that face-to-face curriculum supervision ensures a better understanding and recollection of content knowledge and gives supervisees a chance to bond with one another. However, face-to-face curriculum supervision is not as flexible as online curriculum supervision because the school manager has a strict schedule to follow, which leaves less time for individualised supervisee support when required (Dhawan, 2020; Dung, 2020). Moreover, Zoncita (2020) states that in face-to-face curriculum supervision, for supervisees to be successful they need to actively listen and participate in school meetings, take good notes, and execute their duties as per the CAPS document. This suggests that school managers should be influenced by knowledge perception in order to unpack and clarify all critical aspects of the CAPS document. In other words, face-to-face curriculum supervision does not occur at random, but rather follows a pattern/guideline (s) to ensure that the desired outcomes are achieved.

In addition, see the results of the qualitative study conducted by Lepp et al. (2021) in Estonia. The study aimed to describe and explain what influenced the school managers' curriculum supervision-related decisions and how these were reflected in the curriculum supervision process using a face-to-face platform. The findings of the study reveal that the school managers' decisions were mostly motivated by short-term goals, such as maintaining supervisees' social interactions and supporting supervisees' motivation. The findings also unveil that the desire of school managers to keep supervisees and school managers' own workload affordable was also considered as a factor influencing school managers'-related decisions. This suggests that school managers were driven by knowledge perception because the policy articulates that school managers are responsible for the welfare, unity, and motivation of the school community (Noble & McGrath, 2015). Moreover, the qualitative study conducted by Mather and Sarkans (2018) in Canada, explored the school managers' perceptions of the use of face-to-face mode in curriculum supervision. The study used both open-ended questions and closed-ended questions to collect data. The findings of the study reveal that in face-to-face modality, the importance of interacting with the supervisor and supervisees enhances their curriculum supervision through immediate feedback and supervisors can present working material in an engaging and easily understood manner. For instance, the school manager can summon a supervises/staff meeting in a school boardroom to discuss the inception of end-year examination and the expectations such as the adoption of the management plan, submission of a question book for moderation and distribution of the invigilation timetable. This suggests that school managers should be driven by knowledge perception to ensure that all the supervisees have the necessary material and address all concerns in time, to achieve the curriculum supervision goals. However, the results of the study conducted by Gherhes and Stoian (2021) in Romania offer a similar perspective to the results of the study conducted by Qiu and McDougall (2013) in Canada. The findings of the studies reveal the limitations of face-to-face platforms as they provide a time limit in discussions, and it is hard to an idea or to follow the thread of the discussion.

#### **2.4.2 Online Curriculum Supervision**

Furthermore, online curriculum supervision refers to instructional environments supported by the internet to achieve the educational goals, especially for curriculum supervision (Araka et al., 2020; Coomey & Stephenson, 2018). The latter studies further assert that online curriculum

supervision consists of a wide variety of programmes that use the internet within and beyond school walls to provide access to instructional material as well as facilitate interaction among school managers and supervisees. Likewise, Sadiku et al. (2018) concur with Martin, Sun, et al. (2020) that online curriculum supervision offers exciting opportunities such as recording presentations, and screen sharing for diverse supervisees population. Similarly, Bakia et al. (2012) declare that online curriculum supervision broadens access in ways that dramatically reduce the cost of providing access to quality educational resources (EdTech) and perceptions, particularly for supervisees in remote schools or other situations where challenges such as understaffed schools make the traditional school model impractical and it helps in the realising opportunities for economies of scale through reuse of resources and their large-scale distribution. Moreover, online curriculum supervision encompasses a range of EdTech such as worldwide web, email, chat, new groups and texts, audio and video conferencing, delivered over computer/laptop/mobile phone networks education/knowledge in relation with curriculum supervision (Dhawan, 2020). For instance, a school manager can create a WhatsApp/Facebook group for the school where supervisees can be invited at any time, and everywhere to join/participate in developmental sessions and encouraged to fully participate for their own benefit such as steps to follow when emailing the assessment for pre-moderation to the supervisor (school manager).

In addition to the above, the qualitative study conducted by Julien and Dookwah (2020) in Trinidad and Tobago, shares a similar sentiment as the study conducted by Armstrong-Mensah et al. (2020) in Georgia while aiming to collect data on how the transition to online curriculum supervision impacted school managers. Its goal was to identify the unforeseen benefits of online curriculum supervision. The findings of the study reveal that online curriculum supervision gave school managers the ability to supervise their work at their own pace and to do it when they were ready and to allow them to use different styles/strategies for curriculum supervision. Further to this, the results of the study conducted by Coman et al. (2020) concur with the findings of the study conducted by Hussain et al. (2020) in Sargodha, accentuating the effectiveness of online curriculum supervision by school managers during the wave of COVID-19. The overall findings revealed that online curriculum supervision was an effective and efficient system for curriculum supervision to fulfil the educational needs of school managers at distant locations. In addition, see the results of the study conducted by Nadezhda (2020) in Tashkent (Russia), exploring the introduction of Zoom technology as an effective tool for distance curriculum supervision. The findings of the study reveal that Zoom's features allow

school managers to present the content of their supervision in various ways, such as screen sharing, which can give school managers a great opportunity to develop supervisees' intercultural skills by sharing engaging material such as videos, articles, and presentations. Likewise, the qualitative and quantitative study conducted by Al Fadda et al. (2020) in Argentina, assessed the usefulness of the WhatsApp application in supporting the curriculum supervision process. The findings of the study reveal that using WhatsApp with Microsoft Teams and Zoom has enhanced the curriculum supervision process. This suggests that school managers should be driven by skill perception when supervising curriculum online to acquire different skills from different technology expert in the community to achieve educational needs and CAPS goals.

Nevertheless, see the results of the study conducted by Arkorful and Abaidoo (2015) in Ghana, investigating the effectiveness of using online in curriculum supervision. The study unveils that online curriculum supervision see supervisees undergo contemplation, remoteness, as well as lack of interaction or relation. Thus it requires a very strong inspiration as well as skill perception with to the supervision of time in order reduce such effects. Further to this, the study conducted by Mahyoob (2020) in Saudi Arabia, found the challenges confronted by school managers during the transition to online curriculum supervision during COVID-19. The findings of the study showed that the major challenges encountered by school managers in online curriculum supervision were technical issues. As a result, some school managers faced internet connectivity, school environment access, and working material downloading problems. This suggests that school managers should be influenced by skill perception to ensure that school managers are well-equipped with the necessary skills for EdTech. In other words, the success of online curriculum supervision requires technologically savvy school managers. Further to this, see the results of the study conducted by Attalla et al. (2020) in Malaysia. The study aimed to determine school managers' perceptions regarding WhatsApp usage for curriculum supervision. The findings of the study show that WhatsApp can affect supervisees' work-life balance and may lead to conflict due to improper usage. For instance, if school managers/supervisees use it to tease others or post killer comments if work is not done accordingly. This suggests that school managers should be influenced by skill perception to ensure that they always maintain healthy human relations skills in order to achieve curriculum goals. Thus, for school managers to address the different challenges, they should apply/implement the blended mode for curriculum supervision to ensure that no gaps are left open in curriculum supervision.

### **2.4.3 Blended Curriculum Supervision**

In addition, blended curriculum supervision is described as the effective combination of different modes of curriculum supervision (face-to-face and online) (Alfaki, 2021; Bryan & Volchenkova, 2016). In addition, Mavengano and Marevesa (2022) assert that blended curriculum supervision is an innovative concept that embraces the advantages of both traditional curriculum supervision in school and EdTech-supported curriculum supervision, including both offline and online supervision. The latter studies further declare that blended curriculum supervision needs rigorous effort, attitude perception, a handsome budget, and highly motivated school managers and supervisees for its successful implementation, as it incorporates diverse modes, so it is complex and organising it is a difficult task. Moreover, Alex (2021) agrees with Momade (2021) that when planning the blended workshop there should just be texts, presentation slides, or videos. Instead different materials ought to be given in a mixed way so that supervisees do not get bored and each type of supervisees obtains the given information advantageously. For example, a school manager can organise a capacity-building workshop on special mark adjustment and condonation dispensation for learners in Grades 4-9; the slides for content knowledge can be shared through WhatsApp/Facebook groups, further to this, the hands outs should be given to supervisees and one-on-one/face-to-face questions seeking clarity should be entertained in the school environment.

Further to this, see the results of the study conducted by Muxtorjonovna (2020) in America examining the importance of blended curriculum supervision. Further to this, the objective of this study is to show reasons for using blended curriculum supervision in education. The findings of the study reveal that blended curriculum supervision is flexible and easy to access. Moreover, it can increase supervisees' motivation and their achievements on content knowledge. Similarly, Chen (2022) shares similar sentiments with Graham (2018) that blended curriculum supervision can also result in high levels of supervisees' achievement more effectively than face-to-face curriculum supervision. For instance, a school manager can organise an invigilation workshop using the blended platform (Zoom and face-to-face). The supervisees can all benefit because the presentation can be recorded and emailed to supervisees and handouts can be given in person to read during load-shedding so that even those who could

not attend can get a chance to catch up. As a result, the performance of the school can improve drastically.

Nevertheless, Krasulia (2017) asserts that blended curriculum supervision often requires supervisees to utilise technology outside the school but not every supervisee has access to the resources, which can make online curriculum supervision difficult or even impossible.

Furthermore, Lalima and Learning (2017) state that school managers are trained to use both online and face-to-face simultaneously to supervise curriculum. Further to this, blended curriculum supervision provides a multicultural and multi-dimension approach to the curriculum supervision process, provides supervisees the opportunity to communicate and share their views and feelings with the supervisors all over the world, thus it makes the curriculum supervision process multicultural, and a variety of perceptions bring with it the interdisciplinary and multidimensional factor also. The latter studies further declare that blended curriculum supervision makes school managers play different roles in the school environment, such as motivator, resource person, and organiser. Similarly, the school manager develops content to be provided through EdTech as an additional guide (Dhir et al., 2017). This suggests that school managers should draw from attitude perception when using blended curriculum supervision. In other words, school managers should choose/prefer the most convenient platform from the three for curriculum supervision that can lead to the accomplishment of CAPS goals.

#### **2.4.4 Summary**

Discussed in this chapter were understanding the phenomenon (perceptions), the three levels of technological resources used by school managers to supervise curriculum, Finally, the chapter unpacked the three strategies for curriculum supervision when using EdTech resources.

### **CHAPTER THREE**

### **3.1 Introduction**

The previous chapter discussed a review of the relevant literature on the concept of perceptions of school managers towards the use of Edtech to supervise curriculum. Moreover, the following aspects were covered namely, understanding the phenomenon (perceptions), levels of perceptions (knowledge, skill and attitude, technological resources as well as strategies used for curriculum supervision (face-to-face, online, and blended).

This chapter discusses the school managers' perceptions of curriculum issues, the etymological definition of the word curriculum, levels of curriculum supervision (vertical curriculum supervision, horizontal curriculum supervision, and pragmatic curriculum supervision), models of curriculum supervision (product approach, process approach and political approach), school managers as the instructional managers, and the conclusion. Moreover, it is necessary for the study to unpack the concept of curriculum.

### **School Managers' Perceptions of Curriculum Issues**

### **Figure 3.1 School Managers' Perceptions of Curriculum Issues**

### **3.2 Etymological definition of the word curriculum**

The issue of defining the concept of curriculum is possibly the most challenging of all because the term has been used to imply a variety of things since the field was founded (Ellis, 2014; Taylor, 2018). Further to this, the study conducted by Mpungose (2017) in South Africa, exploring school managers' reflections on the use of Moodle to teach Physical Science (curriculum) supports the ideas of (Morris, 2015); Pinar (1974) that the etymological definition of the word curriculum is derived from the Latin word "currere," which means to run a specific course of study in a school for reaching certain goal in curriculum supervision in particular. Moreover, Petrina (2014) reveals four methods, steps, or moments in the methods/phases of currere namely: the regressive, progressive, analytical, and synthetic. Further to this, Pinar (2014) states that in the regressive phase one returns to (not simply recalls) the past or to aspects of it, for instance, one's school manager perception, the perception of an influential manager or text, one's ongoing relationship with a curriculum supervision. In the progressive phase, one imagines the future (personal, social, political). In the analytic phase one analyses these texts and the perceptions they register and provide to understand what, before might have been obscured by being in the present. That expanded subjectivity becomes, in the fourth phase, synthesised, so one acts anew in the private and public worlds one inhabits. Moreover, the diagram below depicts the four phases of currere.

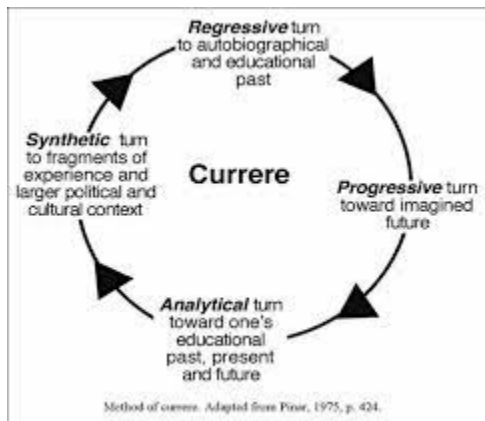


Figure 3.1 Methods or phases of currere. Adapted from Pinar (1975, p. 424)

However, Mulenga (2018) concurs with Walker (1971) by defining curriculum as prescriptive and descriptive plan(s) made for guiding curriculum supervision in the school, usually represented in retrievable documents of several levels of generality, and the actualisation of those plans in school as perceived by the supervisees and as recorded by an observer, those perceptions take place in a curriculum supervision environment that also influences what is supervised. Moreover, the prescriptive (curriculum) definition provides school managers with what ought to happen, and they more often than not take the form of a plan, and intended programme, or some kind of expert opinion about what needs to take place in the process of curriculum supervision (Sharma & Raval, 2019). However, Silva (2009a) defines descriptive curriculum as an emphasis on what supervisees can do with knowledge, rather than what units of knowledge they have, which is the essence of 21<sup>st</sup> century skills.

Furthermore, Dewey (1902) defines curriculum as a continuous reconstruction, moving from the child's present perception/experience out into that presented by the organised bodies of truth that we call studies; various studies are themselves perceptions. Further to this, Dewey believed that classrooms and schools should reflect real-life situations, allowing supervisees to participate in curriculum supervision tasks interchangeably and flexibly in a range of social settings (Dewey, 1938). In addition, Dewey (1938) believed that abruptly introducing an excessive amount of academic material out of context with supervisees' social lives bordered on unethical curriculum supervision behaviour. In addition to the above, Dewey (1938) considered curriculum to be considered a process of living and not preparation for future living.. Moreover, Fallace (2020) concurs with Schmidt and Allsup (2019) when Dewey (1938) describes progressive education/curriculum as a product of discontent with traditional education which imposes adult standards, subject matter, and methodologies. The latter studies

also believed that the traditional curriculum as just described was beyond the scope of novice supervisees. Progressive education, as described by Dewey, should include socially engaging curriculum supervision perceptions that are developmentally appropriate for novice supervisees (Dewey, 1938; Schmidt & Allsup, 2019). Similarly, Dewey thought that effective curriculum supervision came primarily through social interactions and that the school setting should consider curriculum to be a process of living and not a preparation for future living (Williams, 2017). As a result, this set of beliefs set Dewey apart from philosophers who supported traditional school settings. In contrast to the traditional school environment, Dewey thought that schools and curriculum supervision sites should be representative of real life situations, allowing supervisees to participate in curriculum supervision activities interchangeable and flexibly in a variety of social settings (Dewey, 1938; Williams, 2017). The later studies were of the idea that abruptly introducing too much academic content, out of context with supervisees' social lives, bordered unethical curriculum supervision behaviour. This suggests that school managers should draw from certain perception when enacting curriculum activities that can assist to meet the standards of curriculum supervision.

Likewise, curriculum is the entire range of perceptions, both directed and undirected, concerned with unfolding the abilities of the individual school manager (Aladawi, 2020). This suggests that different levels of perceptions play an important role in the development of the abilities of a school manager during the implementation of the curriculum. According to Rugg (1927) and Quartey (2023) curriculum is a succession of perceptions and enterprises having a maximum life likeliness for the supervisee giving the supervisee that development most helpful in meeting and controlling curriculum supervision. Similarly, Lubis et al. (2022) advocate Tyler (1957) in defining curriculum as all the curriculum perceptions planned and directed by the school to attain its educational goals. Moreover, the curriculum is a sequence of content units arranged in such a way that the curriculum of each content may be accomplished as a single act, provided the capabilities described by specified prior content in the sequence have already been mastered by the supervisee (Gagne, 1967; Ten Cate & Taylor, 2021). In addition, Gul and Khilji (2021) define curriculum as all planned curriculum outcomes for which the school is responsible or to all the content offered at a given school. Moreover, curriculum refers to a written plan outlining what school managers could be supervising during the teaching and learning process (McBrien & Brandt, 1997; VanTassel-Baska & Baska, 2021). Furthermore, Cabrera (2010) and Matias (2023) declare that curriculum means the planned interaction of supervisees with instructional content, materials, resources, and processes for assessing the

attainment of curriculum objectives. Silva (2009b) and Brown et al. (2011) describe curriculum as what supervisees can do with knowledge, rather than what units of knowledge they have, which is the essence of 21<sup>st</sup> century skills. This suggests that curriculum is regarded as written/prescribed/documented plan to be followed by school managers during the curriculum process. In other words, the document specifies what supervisees should do and what school managers should supervise, as well as how and when. In addition, Booyse and Du Plessis (2014) declare that Stenhouse in 1974 as an attempt to describe what happens in the school rather than what occurs.

Stenhouse (1975) and Kilag et al. (2023) see curriculum as a process whereby school managers enter particular supervision and situations with an ability to think critically, in-action an understanding of their roles and the expectations others have of them, and a proposal for action which sets out principles and features of the curriculum supervision. Guided by these, school managers encourage conversation between and with, people in the situation out of which may come thinking and action. As a result, school managers continually evaluate the process and what they can see of outcomes. Moreover, for Stenhouse (1975) and Macalister and Nation (2019), curriculum should provide a basis for planning a course and offer principles for: the selection of content (what is to be supervised), the development of a supervising strategy (how is to be supervised), the making of a decision about sequence, and on which to diagnose the strengths and weaknesses of individual supervisee and differentiate the other principles above to meet individual cases. Nevertheless, the latter studies declare that Freire is seen thinking about the purpose of a curriculum as it must serve to liberate supervisees to make links and understand language, perceptions on their struggle. This suggests that school managers' perceptions should be flexible to adapt to any level that can lead to the achievement of set curriculum objectives. Finally, Goodlad et al. (1979) concurs with Akker (2004) as well as Pinar and Doll (2018) that there are three levels of curriculum in supervision namely vertical, horizontal, and pragmatic curriculum supervision.

### **3.3.1 Vertical curriculum in supervision**

Vertical curriculum supervision is defined as the disciplined effort to acquire a historical understanding of curriculum supervision concerning the core duties with leading ideas (Pinar, 2011; Pinar, 2014). Further to this, Acquah and Owusu (2021) assert that vertical articulation

of the curriculum refers to the set competencies taught to supervisees in one lesson, workshop or grade level that prepares them for the next level of study with higher competencies. Further to this, Imbarlina (2014) states that curriculum supervision that is vertically aligned seeks managers who supervise the same curriculum content area across school-level bands. Moreover, vertical alignment curriculum in supervision harnesses the power of a team of school managers to set long-term goals for curriculum supervision instructions and create a plan for meeting these goals (Coggshall et al., 2012). For instance, the school manager can instruct supervisees to comply with the management plan crafted for summative assessment without questioning it. In addition, in vertical articulation, supervision is purposefully structured and logically sequenced so that supervisees gain the knowledge and skills that can progressively prepare them for more challenging, higher-level tasks (Al-Eyd et al., 2018). This suggests that school managers should be influenced by knowledge perception to ensure that supervisees meet the targets of curriculum supervision which are to report to the national Department of Education about the progress of learners and the curriculum coverage. Furthermore, Mills et al. (1996) concur with Guerriero (2014) in declaring that vertical curriculum supervision is implemented and is driven by the ideology of vertical/performance/collection curriculum. This curriculum seems to be influenced by the knowledge perception because the following key aspects need to be vertically aligned namely: supervisees, school managers, curriculum supervision strategies/methods, content knowledge, summative assessment, and curriculum supervision platforms.

According to Morgan (2019), the supervisees (one who is supervised/who works under a school manager in a school performing teaching duties) in vertical curriculum have control over the selection, sequence and dominating in sequence and pace of curriculum supervision. The latter further asserts that supervisees in vertical curriculum are guided by strong distributive rules regulating access and regulating transmission in different modes at different speeds. In other words, they have nothing to say except to take instructions from the school manager for curriculum supervision. In addition, Hoadley (2009) declares that vertical curriculum encourages curriculum supervision that relates to school knowledge, and in turn, assists supervisees in using their new supervision strategies in their work. Further, this builds self-confidence for the supervisees since they depend on their school managers (Massi, 2015). This suggests that school managers should be driven by knowledge perception to ensure that supervisees develop a sense of belonging to the school's managerial activities.

Moreover, Hoadley (2009) posits that the school manager acts as an instructor during curriculum supervision to give instructions that focus on individual supervisees in the school (personalises the supervision). As such the manager's role is more authoritative and there are no negotiations allowed with the supervisees, and the school manager is always guided by the policies in basic education. In other words, the school manager's role is to impart knowledge to supervisees (school manager-centred) during curriculum supervision without giving space for supervisees to voice their perceptions. Similarly, Rafique (2014) avers that the school manager becomes an instructor during vertical curriculum supervision as it provides the curriculum objectives and concludes the session by summarising the key concepts during capacity-building workshops. For instance, during the quality management system (QMS) workshop a school manager can summarise terms like School Development Team (SDT), Personal Growth Plan (PGP), etc. This suggests the school managers should be influenced by knowledge perception to avoid deviation/contradicting the prescripts of the curriculum supervision. In other words, the school managers should be in consultation with the policies that regulate the curriculum supervision to conform with what is spelt out by the policy in relation to curriculum supervision.

In addition to the above, see the results of the qualitative study conducted by Dio (2020) in the Philippines, exploring the strengths of vertical curriculum supervision of the sequence of the content knowledge of curriculum supervision. The findings of the study demonstrate that content knowledge and curriculum supervision performances were arranged in increasing complexity with the corresponding progression of the content knowledge of curriculum supervision. The findings also disclose that the execution of vertically aligned curriculum supervision seeks school managers to be aware of the content knowledge and standards from lower elementary to high level which is necessary for attaining 21<sup>st</sup>-century knowledge. Further to this, supervisees depend on school managers' readiness and understanding of the curriculum supervision design. As a result, this seeks school managers develop curriculum supervision designs based on the subjects/disciplines taught in a school. This suggests that school managers should draw from the content knowledge linked to their qualifications to supervisees' perceptions and their school knowledge. As a result, school managers should be driven by knowledge perception to attain the curriculum supervision objectives. In other words, the written policies served as a guide for the school managers to align vertical curriculum supervision with written curriculum standards and to assist school managers in identifying where supervisees are currently struggling, where they need extra attention and lessen the

supervision burden on school managers and ensure consistency and guidance for school managers when supervising curriculum using Edtech (Burrows et al., 2014).

Furthermore, Hoadley (2009) infers that in a vertically aligned curriculum, the focus in summative assessment (like checking the allocation of marks on a test set to be written by learners is balanced) and is on what supervisees know (presence) or have achieved rather than what they do not know (absences). For instance, the supervisee might poorly introduce the lesson during a quality management system (QMS) classroom visit, the school manager might comment by saying a lovely introduction, rather than saying a poor introduction in front of the learners, then develop their during post evaluation meeting in relation with lesson introduction. This suggests that school managers should be influenced by knowledge perception to ensure there are sound human relations between the school manager and supervisees within the school. In other words, school managers should avoid being driven by feeling and emotion but instead be driven by policies and values of the department such as respect, integrity, and transparency to ensure the smooth running of the school during curriculum supervision using Edtech. Similarly, Hoadley (2009) concurs with Beare et al. (2018) in sharing the idea that vertical curriculum can occur at specified locations or specific levels of an education system such as school boardroom/school manager's office. For example, when standards-based accountability tests are established, school managers should plan school instruction in the office/boardroom in a way that follows the standards for that particular activity (Jagtap et al., 2017). Further to this, the latter studies assert that the standards and assessment themselves must be vertically aligned with one another so that they reflect the logic, and consistent order for curriculum supervision in a content area from one supervisee to another. Moreover, accountability of summative assessment results provides feedback about the strength of the education system (Black & McMillan, 2012). As a result, data can therefore be utilised by decision-makers to assess the various educational levels and make adjustments for development as necessary (Jagtap et al., 2017). This means that school managers should be influenced by knowledge perception to ensure that feedback is given according to the stipulated policies. This includes drawing the subject improvement plan by supervisees if learners have under-performed a task. However, all these parts (stakeholders, school manager, school environment, textbooks, and supervisee achievement outcomes) share the common goal of supervising the curriculum using Edtech so that they become successful in curriculum supervision using Edtech (Jagtap et al., 2017). Thus, vertical alignment is the alignment of different parts of an entire education system (Looney, 2011; Simonet, 2017). This suggests that school managers should be influenced by

knowledge perception to meet the standard of alignment and to close the gaps by taking corrective actions that can give clear guidelines for accomplishing the vertical curriculum supervision objectives. In other words, school managers should be driven by knowledge perception in order to align vertical curriculum assessment effectively to achieve vertical curriculum supervision objectives (growth and development of the supervisees in educational institutions in order to possess adequate knowledge and information that can enhance curriculum delivery). Likewise, School managers should also align curriculum horizontally to ensure that curriculum supervision objectives are accomplished.

### **3.3.2 Horizontal curriculum in supervision**

Hoadley and Jansen (2012) as well as Drake and Reid (2018) declare that a horizontally aligned curriculum is characterised by the idea of integration between subjects. For instance, a school manager can supervise the work/curriculum of the teachers teaching in the same phase using the same supervision tools across all grades to supervise curriculum using Edtech. In addition, Pradhan et al. (2021) state that a horizontally aligned curriculum makes a strong link between school curriculum supervision and real life. Further to this, (Drake & Reid, 2018) state that it is interested in supervisees' competencies which are believed to be innate. Thus, knowledge is not imposed from the outside, but the competencies that supervisees already have are sought on the inside (Griffith et al., 2019; Hoadley & Jansen, 2012). Further to this, a horizontally aligned curriculum is when school managers at the same province district/circuit meet to coordinate curriculum supervision activities using Edtech (Pradhan et al., 2021). This suggests that school managers should be influenced by skill perception to ensure they consult with relevant stakeholders to accomplish the curriculum supervision outcomes. In short, school managers should be lifelong supervisees by consulting former school managers, colleagues, and subject advisors on how to use Edtech for supervision. This may ensure that the following aspects are executed in a correct/appropriate manner: supervisees, school managers curriculum supervision strategies/methods, content knowledge, peer assessment, and curriculum supervision platforms /sites.

In addition, the supervisees have control over the selection, sequence, and pace of curriculum supervision (Reeping, 2019). The latter studies further assert that there is an assumption that all supervisees can learn to perform duties in different ways and at different speeds/paces using Edtech. For instance, school managers may permit supervisees to select the educational

technology resources they can use to submit their work for oversight and control, such as email or WhatsApp, depending on the network's accessibility and supervisee competences. This suggests that school managers should be driven by skill perception in order to consult with different stakeholders to acquire quick and different ways that can be used by supervisees to fast-track submissions for curriculum supervision activities.

Moreover, school managers act as facilitators when curriculum supervision is horizontally organised and the control is socially negotiated (McCormick et al., 2020). As a result, supervisees are allowed to share and brainstorm their ideas on curriculum supervision using Edtech. As such, McCormick et al. (2020) state that discussion of new ideas in a horizontally organised curriculum supervision becomes part of the workflow and the alignment lowers the barriers to school managers borrowing ideas from one another. Further to this, the latter studies declare that when the horizontally aligned curriculum is well implemented, individual creative work is made even more valuable because it is more likely to benefit more supervisees. This suggests that school managers should be influenced by skill perception to ensure that supervisees develop a sense of autonomy and gain the self-confidence needed to use the different Edtech resources to supervise curriculum. In other words, when supervisees are given a chance to share ideas they can create opportunities, without fear, to employ different strategies for using Edtech tools for the accomplishment of curriculum supervision outcomes.

Furthermore, Fayezi (2022) concurs with Jin et al. (2019) that horizontally aligned curriculum supervision using Edtech is supervisee-centred (supervisees take control of their own curriculum supervision). Further to this, Garner and Kaplan (2019) assert that the school managers' role tends to be covert rather than directly transmitting curriculum supervision instruction to the supervisees. This suggests that school managers should be perceived as driven by skill perception to ensure that supervisees are afforded an opportunity to air their views and enact the acquired skills on curriculum supervision using Edtech resources. For instance, the school manager can allow supervisees to display their competence skills for submitting their programmes of assessment plans through Facebook or any relevant Edtech.

In addition, all supervisees are regarded as essentially competent, and able to arrive at certain outcomes during peer assessment, no matter how they achieve curriculum outcomes and how long they take time to achieve them (Cox, 2015). Moreover, the latter study further asserts that school managers share the tasks of peer assessment with the supervisees. This suggests that

school managers should be influenced by skill perception to acquire and master motivation, support, and tolerance skills from societal members and their colleagues to encourage supervisees to strive for the best in using Edtech resources to supervise curriculum.

Moreover, Hoadley and Jansen (2012) concur with Hassan and Shkak (2020) that in a horizontally aligned curriculum supervision, the use of Edtech takes place anywhere to give freedom to supervisees to operate Edtech confidently in a socially/knowledge-based economy and a rapidly changing environment. This suggests that school managers should be influenced by skill perception to adapt to changes/new developments in both local and international contexts through up-to-date and culturally-appropriate Edtech resources (Hassan & Shkak, 2020). For instance, a school manager can give supervisees the freedom to capture learners' marks at any time since the country is experiencing loadshedding (power cuts) stage six sometimes. In other words, school managers being flexible allow supervisees to submit their work at any time if their Edtech resources are with them. As a result, supervisees can develop a passion for the use of Edtech resources for curriculum supervision.

Further to this, Joel (2017) concurs with Azlan et al. (2020) that in horizontally aligned curriculum is essential for enabling supervisees to improve their curriculum supervision knowledge of communication with their school managers both orally and in writing using Edtech. This suggests that school managers should be driven by skill perception to ensure that they gain adequate training/capacity building for skills on the use of Edtech to accomplish curriculum supervision outcomes; this includes typing, emailing, and information searches like search engines (searching information using Google, Wikipedia). Further to this Schleicher (2018) and Gervais (2016) support each other that a horizontally organised curriculum focuses on improving supervisees' understanding of the curriculum supervision demands in the required areas of curriculum supervision, based on the recognition that Edtech resources proficiency is central to curriculum supervision in all content subjects to be supervised. Moreover, Hoadley (2009) agrees with Joel (2017) that in a horizontally aligned curriculum, supervisees are able to use a range of Edtech perceptions to develop knowledge of curriculum supervision, convey and demonstrate competences in curriculum supervision using Edtech, and convey receive knowledge, ideas, instructions, and feelings appropriately in a range of different social contexts. This suggests that school managers should be influenced by skill perception to ensure that supervisees are guided effectively to implement curriculum supervision using Edtech.

### 3.3.3 Pragmatic curriculum supervision

The root of the word pragmatism is a Greek word meaning *actions* (Sharma et al., 2018). Further to this, the latter studies contend that rather than anything metaphysical, pragmatism holds that the truth or significance of an idea or a proposition lies in its evident practical consequences. However, Rai and Lama (2020b) emphasise that the term pragmatism derives its origin from the Greek word *Pragma* meaning activity, practice, or action. As action gets priority over thought, pragmatism is also known as expenditure, which believes in practicability or utility depending upon the truth, reality, goodness, or badness which are all relative terms and are not predetermined or absolute (Rai & Lama, 2020b). Further to this, pragmatism tends to hold the idea that the truth/fact of yesterday needs to be experienced truly, today and tomorrow (Geldien, 2018; Rand, 1984). Additionally, it can be summed up by the expression ‘whatever works,’ it probably is true because reality is subject to change (James, 2020). Therefore, truth must also be changeable and no one can claim to possess any final/ultimate truth for curriculum supervision (Rowan, 2020). In other words, Pragmatism is an ideology that urges school managers to look for procedures and actions that can assist them in reaching their goals for curriculum supervision based on the current truth (Sharma et al., 2018). This suggests that school managers should be driven by attitude perception to look at potential opportunities while considering their racial identities, personal ideologies, and self-identities when implementing the curriculum changes/developments that can help them achieve their curriculum supervision goals. In other words, school managers should be driven by attitude perception whenever enacting the curriculum supervision activities that can ensure that curriculum supervision aims are accomplished.

Furthermore, since curriculum supervision deals with human life and pragmatists think that life is dynamic and susceptible to ongoing change, it must assist school managers and supervisees in meeting their biological and social demands (Rai & Lama, 2020b). In addition, Berenstain (2012) and Ishihara and Cohen (2021) concur with Dewey (1966) that the pragmatic theory of inquiry provides intelligent methods for personal progress and believes that the logic and attitude perception of successful scientific inquiries, properly conceived, could be fruitfully applied to morals and politics. In other words, pragmatic curriculum supervision should ensure that the following aspects are executed in a correct/appropriate manner: supervisees, school

managers, curriculum supervision strategies/methods, content knowledge, formative assessment, and curriculum supervision platforms /sites.

Furthermore, Leighton (2019) concurs with Haug and Odegaard (2015) that formative assessment is a planned, ongoing process used by all school managers during curriculum supervision to elicit and use evidence from supervisees during curriculum supervision. This helps to improve supervisees' understanding of intended disciplinary curriculum supervision aims and support them to become self-directed supervisees. Further to this, formative assessment aims to monitor curriculum supervision to provide ongoing feedback that can be used by school managers to improve their curriculum supervision and their performance (Reddy et al., 2017). This suggests that school managers should be driven by attitude perception to ensure that supervisees' individual needs on the use of Edtech are taken into consideration to accomplish curriculum supervision aims. In addition, Henderson (2018) agrees with Allen et al. (2019) that school managers using formative assessment approaches and techniques in pragmatic curriculum supervision are better prepared to meet diverse supervisees' needs. This happens through differentiation and adaptation of curriculum supervision when using Edtech to raise levels of supervisees' achievements and to achieve a greater equity of supervisees' aims. For instance, a school manager can conduct a formative assessment on the use of Edtech by asking all supervisees to create a class list table using excel and submit it through e-mail. From there the school manager can provide feedback after marking formative assessment. This suggests that school managers should draw from attitude perception to acquire relevant skills to observe and accommodate the supervisees' differences during the process of curriculum supervision when using Edtech. Thus, school managers should be well informed about their crucial roles during curriculum supervision when using Edtech.

In pragmatic curriculum supervision, the school manager's role is to become a researcher (Sohail & Salter, 2022). In addition, Henderson (2018) agrees with Allen et al. (2019) that a pragmatic school manager, as a researcher, seeks to transform supervisees and tackle the problems (challenges) faced during the teaching and learning process. The latter studies further assert that a pragmatic school manager, as a researcher, aims to present alternatives and to take appropriate action(s) that can lead to a democratic state in a working environment. For instance, a school manager can conduct an exploration on which Edtech is convenient for supervisees to use for submitting their work. As such, supervisees can be at liberty to teach the class by using downloaded videos for reptiles' aspect and using office.com by downloading the Microsoft

Teams App whereby learners can be kept engaged with classwork to avoid being disruptive while the teacher is away. This suggests that the school manager should draw from attitude perception to understand supervisees' sentiments in terms of their age/gender when using of Edtech in curriculum supervision. Similarly, the school manager should be well acquainted with the knowledge of values needed for curriculum supervision when using Edtech.

Furthermore, the use of Edtech during curriculum supervision seeks school managers to possess knowledge of values broadly defined as the ability to apply theoretical principles and behaviours associated with planning, implementing, and evaluating the curriculum (Asher et al., 2020; Solikhah & Budiharso, 2019). Further to this, school managers should encourage an ethical way (values/principles) of using Edtech to supervise curriculum activities (Ahmed, 2020; Hayden, 2021). Further to this, personal values are a central content-aspect of the self, which is not distinct from other aspects, such as traits, motives, aims, or attitudes (Müller-Brauers et al., 2020). In addition, Danioni et al. (2020) state that personal values are defined as broad, trans-situational, desirable aims that serve as guiding principles in supervisees' lives. This suggests that in pragmatic curriculum supervision, the use of any EdTech should address the personal needs of both school managers and supervisees to attain curriculum aims. Furthermore, Sharma et al. (2018) support An and Oliver (2021) that pragmatism in curriculum supervision is an educational philosophy that says that education should be about life and personal values. Thus, school managers should train supervisees to be driven by values that are practical for life and encourage them to grow into better supervisees when using Edtech for curriculum supervision. For instance, a school manager can instil values such as professionalism, respect, transparency, and empathy in supervisees to encourage they conduct themselves professionally when using Edtech and develop a sense of empathy when their colleague is struggling to use Edtech and assist and the school manager should be transparent to supervisees especially on financial matters of the school allocated/budgeted for staff development. This suggests that school managers should draw from attitude perception to be able to inculcate values that can promote a sense of oneness (unity) amongst the supervisees. Similarly, the school manager should be clear about the school managers' roles during curriculum supervision process when using EdTech.

Furthermore, Jiang et al. (2019) concur with Van Poeck and Östman (2020) that in pragmatic curriculum supervision, the school manager makes supervisees socially efficient. The latter studies further assert that school managers believe that supervisees should not be asked to work

according to predetermined aims. They should rather determine their aims according to their needs and interests. In addition, Corcoran and O'Flaherty (2022) declare that school managers in pragmatic curriculum supervision should be based on the psychology of individual differences. This suggests that school managers should be influenced by attitude perception to ensure that the supervisees' concerns are addressed accordingly so as to perform to their utmost. For instance, a school manager can ask the supervisees to create a WhatsApp group for their family to inform each other about family situations. In addition, school managers should understand the aims of curriculum supervision using Edtech.

Ravi (2015) supports Chu et al. (2021) that the aim of pragmatist school managers in curriculum supervision using Edtech is for harmonious development of the supervisee in physical, intellectual, social, and aesthetic spheres. Further to this, the aim of pragmatic curriculum supervision using Edtech is to direct the impulses, interests, desires, and abilities towards the felt satisfaction of curriculum supervision using Edtech of supervisees in a working environment (Storey & Haymes, 2023). This suggests that school managers should be perceived as driven by attitude perceptions to ensure that the aims of curriculum supervision, when using Edtech, are of a high standard. In addition, Horta and Li (2022) declare that supervisees' welfare or better living is regarded as an aim for pragmatism in curriculum supervision when using Edtech. Moreover, Abylkassymova et al. (2018) agree with Golubchikova et al. (2021) that the general aim of the pragmatic school manager is the creation of new values. Thus, the main task of the school manager is to put the educed into a position of developing values for themselves. This suggests that school managers should be driven by attitude perception to ensure that supervisees are driven by the set values so as to not deviate from the values that can enhance the attainment of curriculum supervision aims when using EdTech.

Furthermore, Raffo and Roth (2020) concur with Xie and Carspecken (2019) that pragmatic curriculum supervision relates to the supervision of the life of the supervisees. Further to this, Buchs et al. (2017) declare that pragmatism in curriculum supervision when using Edtech believes that in activities supervisees are not listening to school managers but the experience is the subject matter of the curriculum supervision, thus any experience is contributing to growth. The latter studies further assert that school managers do not believe in fixed curriculum supervision or fixed instructional techniques during curriculum supervision when using Edtech. In addition, curriculum supervision using Edtech is based on curriculum supervision

by doing, which encourages a democratic way of supervising through purposeful and cooperative projects and activities (Rai & Lama, 2020a). This suggests that school managers should be influenced by attitude perception when supervising curriculum using Edtech to address the needs of the supervisees such as race, age, interests, gender, and cultural diversity. For example, some supervisees may not be interested in face-to-face curriculum supervision during COVID-19 but prefer online submission because of their experience/perception that they might be infected by the virus but observing their interest in wearing a mask due to COVID-19 cases. Thus, school managers should not confine supervisees to one curriculum supervision platform.

In addition, Fellows and Liu (2021) support the claim made by Ornstein and Hunkins (2009) that in pragmatism, knowledge is based on experience/perception and the use of scientific methods. This suggests that school managers should be driven by attitude perception to ensure that supervisees are not fed with knowledge of using Edtech and instead search on their own by conducting investigation and thorough research to acquire knowledge on the use of Edtech for curriculum supervision. Further to this, Hashemi and Daneshfar (2020) assert that knowledge of pragmatics is based on appropriacy and adaptability in the given social context in communicating intended curriculum supervision. This suggests that school managers should draw from attitude perception to understand and be familiar with supervisees' diversities for the achievement of curriculum supervision aims. For instance, the school manager should consider the environment where supervisees are working and staying. In short, supervisees should not be compelled to use Edtech in an environment that is without electricity/power supply and instead be allowed to use blended curriculum supervision as they will adapt easily to their environment.

In addition, Hogan (2021) concurs with Ishihara (2019) that in pragmatism supervisees in curriculum supervision are not considered mere receivers of knowledge. Rather, supervisees are deemed active participants during the curriculum supervision process. This suggests that school managers should be driven by attitude perception to encourage the development of fresh concepts to address the constantly evolving educational system. Further to this, Ormerod (2021) avers that pragmatic curriculum supervision advocates meeting the needs and interests of the supervisees. This has been interpreted to mean letting supervisees do anything they want, need, and are interested in thereby settings dictates on a whim. Furthermore, Ormerod (2021) agrees with Folse (2017) that because supervisees are uninformed of their needs and interests,

addressing their needs and interests does not always entail waiting for them to offer solutions for curriculum supervision using Edtech. Thus, a well-prepared and driven school manager can offer suggestions and spark the enthusiasm of those they supervise to assist launch Edtech-based initiatives for curricular supervision. For example, school manager can motivate supervisees to suggest new strategies/project for curriculum supervision using Edtech like choosing Facebook group chat/zoom discussion and share development as a form of feedback from their school manager. This suggests that school manager should be driven by attitude perception to allow supervisees to stress their point of views and inventive when comes to curriculum supervision using Edtech.

### **3.4 Models of Curriculum Supervision Development**

The term curriculum model refers to a conceptual framework and organisational structure for decision-making about educational priorities, administrative policies instructional methods, and evaluation criteria (Vidergor, 2018). Moreover, curriculum models help designers to systematically and transparently map out the rationale for the use of EdTech in curriculum supervision (Felten & Finley, 2019). In addition, Wahyudi et al. (2020) support Hoadley (2009) on the introduction of three different models/approaches of curriculum that assist in enhancing the quality and efficiency of curriculum supervision by school managers when using EdTech namely, product approach, process approach, and political approach. Thus, this suggests that school managers should be driven by different perception to be the innovative hubs to deliver quality curriculum supervision when using EdTech. In addition, school managers should read policy documents with reference to product approach for accomplishing curriculum supervision objectives.

#### **3.4.1 Product approach in curriculum supervision**

A product approach in curriculum supervision development is a “traditional approach in which supervisees are encouraged to mimic a model text, usually is presented and analysed at an early stage” (Gabrielatos, 2002, p. 5). Further to this, a product approach of curriculum supervision development focuses on results (objectives), with successful completion of tasks, like curriculum supervision, as the primary goal (Glatthorn et al., 2018). Moreover, the latter studies further assert that school managers who follow this model have significant benefits such as the ease with which progress can be measured with the use of EdTech to enhance curriculum supervision. Similarly, Abie (2014) and Tejedor et al. (2019) concur with Tyle (1947) that a

product approach, is guided by four fundamental questions namely: What educational objectives should be attained (objectives)?; What will I supervise to achieve objectives (content knowledge & pedagogy)?; How will I organise my curriculum supervision (EdTech resources)?; and, How will I determine whether these objective are attained (assessment/evaluation)? This suggests that when implementing EdTech, school managers should be driven by knowledge perception to make consistent and informed judgments about curriculum supervision. Furthermore, while adopting EdTech, objectives are critical to the successful implementation of curriculum supervision.

Furthermore, Hedin and DeSpain (2018) define objectives as specific, measurable, short-term, and observable statements for curriculum supervision when using EdTech. Further to this, Corey et al. (2020) assert that objectives provide support for developing supervisee's curriculum supervision knowledge. In addition, objectives enhance curriculum supervision support and improve curriculum supervision performance by creating school managers' s-centred curriculum supervision environment with more supervision opportunities when using EdTech (Cicco, 2014; Wu et al., 2020). Similarly, Sellers et al. (2016) concur with Ngole and Mkulu (2021a) that in curriculum supervision, objectives assist in providing accountability for both school managers and supervisees in exploring practice and performance. However, see the findings of the study conducted by Pusca and Northwood (2018) in Windsor as well as the results of the study conducted by Northwood (2013) in Windsor, Ontario, Canada. The main objectives of both studies were to explore the adoption of curriculum supervision objectives when supervising curriculum using EdTech by school managers. The findings in both studies reveal that the use of curriculum supervision objectives kills originality and creativity and that they are shifting their emphasis from supervising curriculum using EdTech to objectives. In other words, school managers should use their legitimate power over supervisees to attain the objectives set for curriculum supervision when using EdTech. For instance, the school manager should monitor supervisees when using a television to teach dialogue to achieve listening and observation skills as the objectives of the lesson do not deviate to that channel opened to another channel like sports for enjoyment. Further to this, product approach also has limitations which hamper the implementation curriculum supervision using EdTech.

Moreover, Revilla-Cuesta et al. (2020) concur with Tyle (1947) that in order to unpack the question of what will be supervised in order to achieve objectives, school managers should be informed of content knowledge which is about knowing the content to be supervised during

curriculum supervision process. Further to this, in a product approach in curriculum supervision development, school managers should be aware that the content is prescribed with stipulated time frames to be met by supervisees (Agha et al., 2019; Bastug et al., 2017). In addition, Bautista and Orte (2021) agree with Teslia et al. (2020) that the content to be supervised should be well organised to attain the set objectives. Further to this, Boz and Belge-Can (2020) concur with Shulman (1986) that school managers who possess content knowledge can effectively create representations for concepts, and recognise supervisees' preconceptions and misconceptions of content. This suggests that School managers should draw from knowledge perception to ensure that all the principles and concepts related to curriculum supervision are applied to accomplish the intended objectives of curriculum supervision.

Furthermore, content knowledge plays a pivotal role in curriculum supervision because it involves school managers' performances in delivering the conceptual approach, relational understanding, and adaptive reasoning of the content to be supervised using EdTech (Donato, 2021; Jacob et al., 2020). In other words, while adopting EdTech, school managers should be well-equipped with content knowledge to inspire supervisees to utilise EdTech effectively when executing their primary activities, and this can help school managers catch up when misconceptions and errors occur.

Moreover, Greenhow et al. (2021) support the ideas of Li et al. (2023) in defining EdTech resources as the combined use of computer hardware, software, and educational theory and practices to instruct curriculum supervision. Further to this, the latter studies, further declare that the school managers should ensure that relevant EdTech resources are in place for the accomplishment of curriculum supervision objectives. This suggests that school managers should be informed by knowledge perception to ensure that the necessary resources are available so they can use various ways for curriculum supervision, for example, laptops, scanners and printers should be in place for scanning and printing documents to be emailed. In addition, EdTech resources have a positive impact on school managers because EdTech can cause supervisees to be more engaged, as a result, supervisees often retain more information for curriculum supervision (Rambe & Mkono, 2019; Rasool et al., 2022). Moreover, Thomas (2016) believes with Singh et al. (2021) that EdTech offers an opportunity for school managers to become more collaborative and extend curriculum supervision beyond the school. As such, school managers can create curriculum supervision communities composed of supervisees, fellow school managers, teachers, and various experts in curriculum supervision using EdTech

(Ghani & CMP, 2020; Nilson & Goodson, 2021). This suggests that school managers should be driven by knowledge perceptions to help them learn new skills, such as how to use search engines such as Google and Google Scholar to enhance their knowledge of curriculum supervision when using EdTech. Moreover, the school managers should administer a summative assessment of the supervisees based on their performance.

Furthermore, summative assessment is defined as an assessment administered at the end of an instructional unit in curriculum supervision when using EdTech (Dixson & Worrell, 2016; Mogboh & Okoye, 2019). Further to this, Pesqueira et al. (2021) agree with Tyle (1947) that summative assessment can be done to monitor the supervisees' progress, provide feedback and grading, and to evaluate academic achievement after the defined objectives. Thus, this suggests that school managers should be influenced by knowledge perception to identify knowledge gaps in supervisees seeking to be attended urgently to achieve curriculum goals. Further to this, Ten Cate et al. (2015) agree with Svensäter and Rohlin (2023) that the main objective of summative assessment is to evaluate the overall progress for curriculum supervision when using EdTech. In addition, summative assessment sets benchmarks to evaluate performance and helps to improve product approach in curriculum supervision development (AlShamsi, 2023). This suggests that school managers are expected to evaluate supervisees' performance in order to ensure that curriculum objectives are attained. In other words, school managers should be influenced by knowledge perception to ensure they are well acquainted with summative assessment policies such as the Quality Management System (QMS) document processes, procedures, and objectives. For instance, a school manager can instruct the supervisees to complete and submit their mid-year work plans and their self-evaluation scores for verification by school manager, thereafter, awarded mid-year scores that can inform their summative assessment scores by staff development team at the end of the year. If supervisees are not performing as expected in terms of EdTech in curriculum supervision, the school managers should draw from knowledge perception to refer to documents that speak of intervention, practices, and initiatives to understand how well they achieve curriculum supervision objectives.

Likewise, summative assessment gives supervisees a chance to implement their curriculum supervision when using EdTech with a real problem and helps evaluate curriculum and supervision gaps (Das et al., 2017; Ismail et al., 2022; Mogboh & Okoye, 2019). However, Villarreal-Davis et al. (2021) argue that summative assessment reduces creativity involvement

because supervisees have little room to showcase their creativity when following a standard assessment method. Similarly, Alkaabi and Almaamari (2020) concur with Dixson and Worrell (2016) that summative assessment reflects on teaching ability when school managers get only one chance to evaluate supervisees' performance, this reduces their curriculum supervision standards. As a result, they cannot make real-time changes in their curriculum supervision methods. In addition, since summative assessment emphasises output at the end, the curriculum supervision process might be challenging if there are obstacles or issues (McCarthy, 2015; Reddy, 2019).

According to Steele (2004) a product approach in curriculum supervision is usually carried out in four stages, namely: Stage One, model texts are given to supervisees and important features are highlighted. For instance, school managers should provide supervisees with their duty load to be executed and instruct them to save on their laptops. In Stage Two, the isolated controlled practice of the highlighted features is provided. For instance, supervisees should be apprised of the supervision date and what is to be supervised. In Stage Three, ideas are organised. For example, school managers should ask supervisees to draw their assessment programmes using a table and convert it into a PDF at the beginning of the year and submit it to the school managers for curriculum supervision. Finally in Stage Four, supervisees individually produce the final product by using the skills, structures, and content they have been supervised. For example, school managers should apply the policy using their skills such as interpreting, understanding, and communicating. This suggests that school managers should be driven by knowledge perception to ensure that they clearly understand the notion of inquiry in a particular way and how school managers supervise curriculum using EdTech.

### **3.4.2 Process Approach in Curriculum Supervision**

Process approach/model was developed by Stenhouse in 1975 and focuses on knowledge as the growth of understanding (Atta et al., 2021; Stenhouse, 1975). Further to this, the process approach depended for its success on the quality of the school manager, who needed wisdom and scholarship in curriculum supervision (Casey & Kirk, 2020; Priestley & Humes, 2010). In addition, Du Toit (2019) concurs with Stenhouse (1975) in believing that skill perception related to and underpinned in curriculum supervision should be developed through inquiry-based and open-inquiry curriculum supervision (school managers should encourage supervisees to ask questions, have a dialogue to explore new ideas) and that should drive

curriculum supervision development. This suggests that school managers should be driven by skill perception to ensure that the curriculum supervision process encourages supervisees to think critically to solve problems relating to curriculum supervision when using EdTech. For example, the school manager can ask the supervisees to compile a list of all learners benefiting on social grants in their classrooms using Microsoft Excel, the school manager can see and facilitate supervisees to follow steps to create a table with sufficient columns using Microsoft Excel.

Moreover, the process model/approach is concerned with how school managers supervise curriculum using EdTech and with their growth and development as school managers (Xu & Babaian, 2021). In other words, school managers are viewed as active participants in the advancement of knowledge and comprehension of the process of curriculum supervision using EdTech. In addition, this curriculum model is flexible, open, creative, and innovative (Henze, 2020; Potter, 2021). Furthermore, Newlyn (2016) and Potter (2021) advocate Stenhouse (1975) three main components of the process model, namely: content, methods/pedagogy, and evaluation/assessment. Further to this, it is much more important to understand the content of curriculum supervision in the process model.

Content in a process model describes all content types and their association with one another (relationships) and with an outcome of the curriculum supervision when using EdTech (Ruedas, 2021; Tukker & Tischner, 2017). Moreover, Monteiro et al. (2020) agree with Johanson and Vahlne (2015) that the content of the process model emphasises the acquisition of experiential skills rather than specific content. In other words, school managers act as facilitators of curriculum supervision when using EdTech to disseminate the content. This suggests that school managers should be driven by skill perception to allow supervisees to apply their skills and creativity in using EdTech to unpack the content. In addition, the content knowledge in the process approach encourages school managers and supervisees to play active roles in curriculum supervision (Afshan et al., 2022; Ncube, 2019). Further to this, school managers should ensure they apply the appropriate curriculum supervision pedagogy when using EdTech.

Curriculum supervision pedagogy can be defined as the theory and practice used in supervising curriculum regulation in an educational context and is aimed at improving the action and skills of the school manager in supervision such as the reflective approach, collaborative approach,

the integrative approach, and inquiry-based approach and others (Bastalich, 2017; Karahasanović & Culén, 2023; Vehviläinen & Löfström, 2016). In addition, school managers should research and reflect on their own actions (Henze, 2020; Potter, 2021). Similarly, school managers should align with the needs of the supervisees to help them better understand their practices so they can adjust, modify, and perfect them (Aldaihani, 2017; Alkaabi, 2021). Further to this, supervisees who participate in problem-based activities in a process curriculum approach using Edtech can improve their abilities to retain and recall information (Agarwal et al., 2021; Almalki, 2020). However, Abdelkarim et al. (2018) stressed that devoting too much time to the process model approach can cause challenges when supervisees take standardised tasks as they may not have the breadth of skills to meet deadlines. For instance, supervisees cannot withstand work under pressure when instructed to type and submit subject improvement plans with immediate effect (like if instruction comes at 13h30 and is submitted at 15h30 at the district office). Moreover, the process model in curriculum supervision can engage many supervisees, but others may feel disengaged because of not being ready to handle this type of task for a few reasons like, immaturity (supervisees may not struggle display enough maturity effectively when working as a group, not fulfilling expectations and distracting other supervisees, like interrupting other supervisees who are working on something, like asking how to drag the mouse. This suggests that school managers should be driven by skill perception to allow all supervisees to have a say in how curriculum supervision using EdTech should be supervised, which is how supervisees can create/develop a sense of autonomy. Further to this, school managers should encourage peer assessment during the process model using EdTech,

Peer assessment is defined as a process in which supervisees provide feedback to other supervisees (Foskett & Van Vliet, 2021; Lambie & Ascher, 2016). The latter studies further affirm that the purpose of this feedback is to help their colleagues improve their curriculum supervision using EdTech. In addition, peer assessment provides a structured curriculum supervision process for supervisees to critique and provide feedback to each other on their work to get lifelong skills. This suggests that school managers should be perceived as driven by skill perception to ensure they encourage peer assessment to help supervisees develop lifelong skills for curriculum supervision using EdTech. Nevertheless, Raes et al. (2015) agree with Damit et al. (2019) that peer pressure and friendship can influence the reliability of assessment. For instance, during QMS evaluation/assessment supervisees can award higher marks to their colleagues due to prolonged friendship. Further to this, supervisees are not experienced in assessing each other. For instance, the novice supervisee can be expected to assess/evaluate the

experienced supervisee and thus can be influenced by seniority to award higher marks forgetting that QMS is for developmental purposes. This suggests that school managers should be influenced by skill perception to ensure they obtain the necessary skills from other stakeholders on how to conduct advocacy and training for QMS for the effective attainment of curriculum supervision outcomes.

### **3.4.3 Political approach/model**

The political approach is described as the technical production perspective of curriculum planning such as banking education (Du Toit, 2019). Further to this, Freire (2000) and Freire (2021) claim that the future is not something hidden in a corner but rather something we build in the present. The latter studies further argue that a school manager must recognise that curriculum supervision using EdTech is never value-neutral, which allows them to look carefully at the hidden aspects of curriculum supervision since curriculum supervision has the power to oppress or liberate the supervisee. This suggests that school managers should be driven by attitude perception to ensure that supervisees are emancipated to express their ideas regarding their personal needs, identities, and gender/age when using Edtech for curriculum supervision. In other words, school managers should not oppress supervisees to do what favours them, thus, school managers should be considerate about the accomplishment of curriculum supervision aims. Furthermore, Bezeljak et al. (2020) and Vakil (2018) concur with Freire (2000) that the political approach is motivated by five fundamental prepositions, namely: content, pedagogy, assessment, activities, and aims. In addition to the above, the content of the political approach is of vital importance for the attainment of curriculum supervision aims.

Moreover, Van der Voort et al. (2019) agree with Buchanan and Badham (2020) that political content knowledge is defined as the knowledge about the different and competing views on what ideas are important and should be seen to prevail and hold value over other in their being considered true regarding curriculum supervision using EdTech. Further to this, Aronowitz and Aronowitz (2015) as well as Lunevich (2022) emphasise that a democratic relationship between the school manager and the supervisees is necessary in order for the consciousness process to take place during curriculum supervision using EdTech. This suggests that school managers should be influenced by attitude perception to develop, enhance, and change the consciousness considering the individual needs of the supervisees. In addition, the latter studies, support Freire (2000) who can see supervisees as empty receptacles into which school

managers must deposit their knowledge. Thus, this content knowledge is called the banking method of education. This approach is like the process of colonisation, given that the colonising culture thinks of itself as the correct and valuable culture for the betterment of curriculum supervision using EdTech. In other words, if school managers are drawing from attitude perception, they are able to colonise and persuade supervisees to adopt any culture instilled by the school managers for the achievement of curriculum supervision aims. However, Ljubenkov et al. (2018) advocate Freire (2000) that the banking approach promotes a lack of critical thinking (when school managers expect supervisees to accept their word as unquestionable truth), and there is no scope for the use of cognitive aims to critique of the information presented. The latter studies further assert that school managers use their power over supervisees to make them comply with what school managers know. This suggests that school managers should be driven by attitude perception to ensure that supervisees are not oppressed/confined to their school managers' wills/craves who may be force-feeding the knowledge to supervisees to attain curriculum supervision aims. In addition, school managers should familiarise themselves with the pedagogy for enacting curriculum supervision using EdTech in a political approach to curriculum development.

Moreover, as a political practice in curriculum supervision, pedagogy can draw attention to relationships between power and knowledge of curriculum supervision using EdTech (Bhola et al., 2022; Johnston, 2021). Further to this, the latter studies claim that pedagogy can be influenced by hegemonic forces that direct what constitutes valid knowledge from identities reproduced through the socialisation of education particularly curriculum supervision using EdTech. In addition to the above, Healy (2022) and McGowan (2020) affirm that the role of school managers in the political approach during the curriculum supervision process is to help supervisees develop critical minds. Further to this, the idea of critical thinking is common across the humanities and personal sciences (Cáceres et al., 2020; Mandal, 2018). Furthermore, Turner et al. (2021) concur with Borders et al. (2022) that in a political approach, supervisees are engaged with a body of knowledge, rather than being trained in specific attitudes. This suggests that school managers should be influenced by attitude perception to ensure that individual beliefs and personal needs are supported to enhance the curriculum supervision aims. Nevertheless, Hoerl (2018) supports Martínez (2020) that the most common critique of political approach model pedagogy is that it is a biased and largely negative, based on critiques of capitalism and capitalist supervision from tenured radicals bred in the counter-culture. In other words, for school managers to successfully overcome attention problems in reference to

curriculum supervision can hinder the achievement of curriculum supervision aims should be driven by attitude perception. In addition, school managers should be knowledgeable about activities that can expedite political approach in curriculum supervision using EdTech.

Moreover, Bergh and Wahlström (2018) advocate Lindqvist et al. (2020) that political approach activities refer to actions conducted by school managers with the hope of influencing the supervisees to cooperate during the curriculum supervision using EdTech. Further to this, the latter studies go on to say that the activities imply an active role in the political approach to curriculum supervision using EdTech. In addition, Booyse and Du Plessis (2014) emphasised dialogue as important for both school managers and supervisees in school. The latter studies further assert that cooperative activities can be seen as enhancing the community and building attitude. This suggests that school managers should be driven by attitude perception to ensure that the rationale and the aims of curriculum supervision are accomplished. Furthermore, the political approach helps bureaucrats (school managers) and supervisees to interpret the policies of curriculum supervision using EdTech to be implemented easily (Elabbar, 2018; Reimers, 2020). In addition to the above, Hawkins and McMahon (2020) claim that the political approach helps in understanding the problems of the supervisees and exploring the ways to solve them. This suggests that school managers should be perceived as driven by attitude perception to ensure that the rights of the supervisees are always protected and not infringed on by school managers. However, the greatest difficulty in the political approach is the changing, ephemeral, ambiguous, subtle, and coercive nature of curriculum supervision (Elliott-Renhard, 2021; Potasznik, 2020). Moreover, in a political approach, curriculum supervision using EdTech cannot be comprehended easily by supervisees and even those with advanced minds (Barkas et al., 2022). This suggests that school managers should be influenced by attitude perception to ensure the betterment of curriculum supervision can yield the desired aims. Further to this, school managers should understand the articulated aims for curriculum supervision using EdTech.

Furthermore, Van Aardt (2021) and Novak (2023) stress that the political approach aims to evolve the standard of right and wrong, for critical evaluation of existing schools and its laws and policies. In addition, the political theory aims to train school managers to think rationally about curriculum supervision questions and assess correctly the curriculum activities of the time (Moore, 2020; Ruffin, 2022). This suggests that school managers should be driven by attitude perception to ensure they are able to justify to supervisees about using EdTech for

curriculum supervision and how to practice it and to make them understand the concepts of curriculum supervision systems, including its values such as democracy, equality, individuality, and justice. However, Mill (2022) concurs with Coujou (2015) that political theory claims that disobedience rests upon its effort and ability to provide these conditions of fulfilment of human personality. In other words, school managers should be driven by attitude perception to make sure there is equitable distribution of EdTech resources for curriculum supervision, that values of democracy (respect for human rights) are observed, and different understandings of power (coercive power) are not misused. Thus, this suggests that the aims of curriculum supervision using EdTech can be accomplished. In addition, school managers should be cognisant with the formative assessment for political approach during curriculum supervision using EdTech.

Moreover, Offerdahl et al. (2018) concurs with Chan (2021) that formative assessment is defined as a process used by school managers and supervisees during the instruction process that provides feedback to adjust ongoing curriculum supervision using EdTech to improve supervisees' achievements of the planned curriculum supervision aims. Furthermore, according to Freire (2000), Booyse and Du Plessis (2014), and Tønseth and Bergsland (2019), formative assessment in political approach should focus on the purpose of curriculum supervision using EdTech and to liberate supervisees to free their potential and provide opportunities to find and express their own core business (curriculum supervision using EdTech). This suggests that school managers should be motivated by attitude perception to ensure that formative assessment does not go astray but serves its purpose by considering/prioritising the interest of supervisees. Further to this, formative assessment in political approach serves as a further direction to what is intended to be achieved through the implementation of the curriculum supervision using EdTech (Krishnan et al., 2021; Su et al., 2022). Nonetheless, Kissling and Arnold (2022) concur with Bennett et al. (2017) that formative assessment in the political approach is time-consuming and resource-intensive (it requires frequent data collection, research, reporting, and refinement of the implementation plan to ensure its success). This suggests that school managers should draw from attitude perception to confirm that the supervisees do not spend a lot of time gathering data on one activity rather than engaging in other profitable activities that can help the organisation achieve its stated aims. For instance, when supervisees are asked to calculate pass, fail, class average, and subject achievement percentages for the full grade (class analysis), supervisees may become perplexed and lose motivation to use EdTech. According to this, school managers should be driven by

attitude perception to make sure that supervisees' opinions are considered and to aid in the development of new abilities necessary to accomplish the stated aims of curriculum supervision.

### **3.5 Levels of school managers in curriculum supervision**

Management has a significant impact on curriculum supervision using EdTech because the approach sets the tone for the entire process (AlHamad et al., 2022; Elumalai et al., 2021; Nicolaou et al., 2019). For instance, the democratic management approach is likely suited to educational management because it emphasises collaboration and coherence among school managers (Liu et al., 2021). In addition, the latter studies emphasise the importance of collaboration in education. According to Faridaha et al. (2022) and Lorensius et al. (2021), there are three levels of approaches/models of management used by school managers during curriculum supervision, namely: transformational manager, situational manager, and instructional manager. Further to this, school managers should understand the basic principles that guide the transformational manager during curriculum supervision using EdTech (Acton, 2021; Mhlanga et al., 2022).

#### **3.5.1 School manager as a transformational manager**

The term transformational management approach was invented by Downton in 1973 to enhance the motivation, morale, and job performance of supervisees (Muzondiwa et al., 2022; Smit et al., 2021). Further to this, a transformational school manager can be described as an assessment of a school manager's ability to influence supervisees to enhance their awareness of the value of work, prioritise groups' interests, and increase supervisees' needs to achieve better outcomes for curriculum supervision (Ahmed & Al Amiri, 2022; Lai et al., 2020). Furthermore, in the transformational approach/model, the school manager is seen as ideal for dealing with difficulties that develop as a result of globalisation (such as the advent of COVID-19) and are driven by user demand (Klein & Todesco, 2021). Further to this, the transformational approach is characterised by four basic principles (4 I's), namely: idealised influence (charisma), inspirational motivation, intellectual stimulation, and individualised consideration (Bass & Avolio, 1993; Hosna et al., 2021; Khan et al., 2022). This suggests that school managers should be driven by skill perception to consult from the society retired school managers as well as subject advisors to be equipped with the necessary skills to apply these principles effectively

and efficiently. Moreover, the figure below depicts the four principles of the transformational management approach.



**Figure 3.2 transformational management approach (Bass & Avolio, 1993)**

In addition, the school manager should be cognisance of the principle of idealised influence during the use of EdTech for the curriculum supervision process.

Moreover, idealised influence (charisma) refers to the modelling of exemplary behaviours that are aligned with organisational outcomes (Afshari, 2022; Boukamcha, 2019). Further to this, the latter studies declare that idealised influence/charisma is a primary strength of school managers that motivate supervisees to carry out their tasks such as marking learners' work, compiling class lists, and marking schedules. In addition, Corey et al. (2020) support Anderson (2022) that the idealised influence allows supervisees to not only identify with the school manager but also to truly desire to be like school managers in using EdTech resources for the smooth running of curriculum supervision using EdTech. As a result, the idealised influence leads school managers to have respect, trust, and confidence in their supervisees (Hendron, 2022). However, Churcher et al. (2023) and Ahmad and Saad (2020) claim that idealised

influence is one of the most criticised components of transformational leadership in curriculum supervision because some transformational school managers with charisma may misuse their power and privilege. As a result, school managers may start to neglect supporting their supervisees and this may lead to the school being dysfunctional (Ahmad & Saad, 2020; Churcher et al., 2023). This suggests that school managers should be driven by skill perception to ensure they possess relevant skills that can influence supervisees to emulate the behaviour expected in a school to achieve curriculum supervision outcomes. In other words, school managers should familiarise themselves with enactment for undertaking inspirational motivation, particularly on the use of EdTech resources to supervise curriculum.

Furthermore, Collins et al. (2020) concur with Bakker et al. (2022) that inspirational motivation is the degree to which a school manager articulates an appealing vision that inspires and motivates supervisees during curriculum supervision to perform beyond expectations. In addition, the latter studies go on to declare that school managers who adopt inspirational motivation have high standards and expectations for their supervisees. Similarly, an inspirational motivation school manager can empower supervisees to develop a passion for the use of EdTech resources for curriculum supervision and how they accomplish desired tasks (deliver quality education in their classrooms) (Burton, 2021; Obiagu, 2023). Further to this, school managers who practices inspirational motivation have an increased engagement (promote a clear sense of purpose to their supervisees) and meet objectives (encourage supervisees to set ambitious outcomes and accomplish them consistently) (Arghashi, 2022; K Kariuki, 2021). However, Collins et al. (2020) agree with Borde et al. (2022) that inspirational motivation can lead to the supervisees' burnout (feeling their presence as a constant pressure) and can be risky and disruptive (the problem with change is that it becomes disruptive if it happens too frequently and detrimental if the school manager takes excessive or unnecessary risks). Thus, this suggests school managers should be influenced by skill perception to create/develop systems that can promote a conducive/healthy atmosphere during curriculum supervision using EdTech. In addition, school managers should employ different strategies to instil intellectual stimulation in supervisees in the workplace.

Moreover, intellectual stimulation is defined as having a manager who encourages innovation and creativity, as well as critical thinking and problem-solving (Begum et al., 2022; Jung et al., 2003). Similarly, according to the latter studies, intellectual stimulation fosters an active, engaged, and healthy team grows together and is focused on client (learner/parent) solutions.

For instance, a school manager can motivate supervisees to develop themselves by furthering their studies to improve their pedagogical knowledge (online pedagogy using EdTech resources) in teaching. This suggests that school managers should draw from skill perception to boost supervisees' thinking and inventiveness, as well as their ability to solve challenges creatively. In other words, school managers can acquire a variety of skills from society on how to inspire supervisees to be innovative during curriculum supervision using EdTech. Further to this, school managers should take note of individualised considerations during curriculum supervision using EdTech.

Furthermore, individualised consideration is defined as the extent to which a school manager attends to each supervisees' needs (Hawkins & McMahon, 2020; Tropman, 2022). In addition, the latter studies further state that the school managers listen to the concerns and needs of each supervisee, provide support, and are emphatic about each supervisees' situation and background. This suggests that school managers should be perceived as driven by skill perception to maintain good interpersonal relations during curriculum supervision using EdTech. In other words, school managers should familiarise themselves with all relevant stakeholders in the society. For instance, if a supervisee has lost an immediate family member must be granted a family responsibility to prepare a funeral through advice obtained from basic conditions of employment component specialists. Further to this, the school manager should often adopt a situational management approach/model during curriculum supervision using EdTech.

### **3.5.2 School manager as a situational manager**

According to Heasley and Palestini (2022), and Stark (2022) the situational management approach is a behavioural practice in which school managers select their management approach to best fit the situation and readiness level of their supervisees. In addition, a similar expression was made by Cruise (2022) and Villet (2020) that a situational manager studies the desires and attitudes of their supervisees and then applies their management approach accordingly. In other words, the situational management approach is all about understanding their supervisees' needs and potential to use EdTech resources in order to improve curriculum supervision aims (Baku & Fugar, 2021). This suggests that school managers should draw from attitude perception to understand the dynamics of age, gender, values, and culture of the supervisees that may contribute to the failure or success of achievement of curriculum supervision aims. Further to

this, Mirzal and Ninglasari (2021) concur with Setyaningsih et al. (2023) that the situational management approach is influenced by four basic principles/elements namely: directing/telling, coaching/selling, supporting/participating, and delegating. Table 3.3 below depicts the four principles of situational management approach.

<b>Management approaches</b>	<b>Key Actions</b>
1. Directing/Telling	The manager gives clear direction and supervises people and their work closely. Good for trainees and emergencies.
2.Coaching/Selling	The manager expands the team’s skills base and discusses work methods, priorities etc. more with team members.
3.Supporting/Participating	The manager gives personal support and encouragement to individuals and the whole group at team members’ times of worry and pressure.
4.Delegating	Having given directing, coaching, and support, the manager now lets ‘go of the reins’ and starts delegating higher-level work to people. Leader eventually leaves people alone to do the higher-level work with little or no supervision.

**Table 3.3 created by Ghazzawi et al. (2017)**

Further to this, school managers should understand how and when to apply directing during the process of curriculum supervision using EdTech.

According to Davies and Polaschek (2019) and Veach (2023), coaching is a type of situational management approach that involves a great deal of hands-on involvement in the supervisees' curriculum supervision process. In addition, the latter studies further declare that the supervisees are not yet confident in their abilities but are getting it there. Furthermore, coaching allows school managers to connect with their supervisees and help them reach their full

potential (Bachkirova et al., 2021). However, Hawkins and McMahon (2020) and Bachkirova et al. (2021), advocate that coaching requires a lot from school managers (it requires an ongoing formative assessment of supervisees and careful decision-making to choose the approach that works best in each scenario). For instance, school managers can provide coaching to supervisees on how to calculate average scores for learners using Excel. This suggests that school managers should be driven by attitude perception on the use of EdTech resources to ensure that supervisees become critical thinkers in relation to values, gender, and culture to achieve curriculum supervision aims. Further to this, school manager should consider directing when practicing curriculum supervision using EdTech.

In addition, Leclerc et al. (2021) assert that directing is an initial or basic level of management approach which is mostly a one-way street with little input from the supervisees. Further to this, the latter studies progress declaring that a school manager can practice directing when a supervisee needs detailed guidance on a specific task such as drawing graphs for results analysis for a particular term. Similarly, directing enables school managers to provide effective guidance and support to supervisees with the use of EdTech during the curriculum supervision process (Carroll et al., 2020; Mensah, 2022). Nevertheless, for Pardede and Purnamasari (2021) and Schmittel et al. (2023) directing can limit the supervisees' ability to take initiative with the use of EdTech resources for curriculum supervision. This suggests that school managers should be driven by attitude perception when using EdTech resources to ensure that the supervisees are well-capacitated by having sound communication attitudes. As a result, the curriculum supervision aims can be attained. In addition, support should be provided to supervisees by school managers during curriculum supervision.

Moreover, in the supporting/participating approach, the school manager and the supervisees make decisions together to maintain unity and cohesion during the use of EdTech resources for curriculum supervision (Gardner et al., 2021; Turney & Ruch, 2018; Wong et al., 2022). In addition, the latter studies further declare that the role of the school manager is to instruct, command, encourage, and support the supervisees where they are lacking. For instance, when supervisees are unable to solve the problem of downloading and completing a template for the subject improvement plan themselves, the school manager can show them how to connect to the network and download a template. In addition, Knight (2017) concurs with Newman (2022) that supporting in the situational management approach increases supervisees' effectiveness and fosters growth and development when using EdTech resources for curriculum supervision.

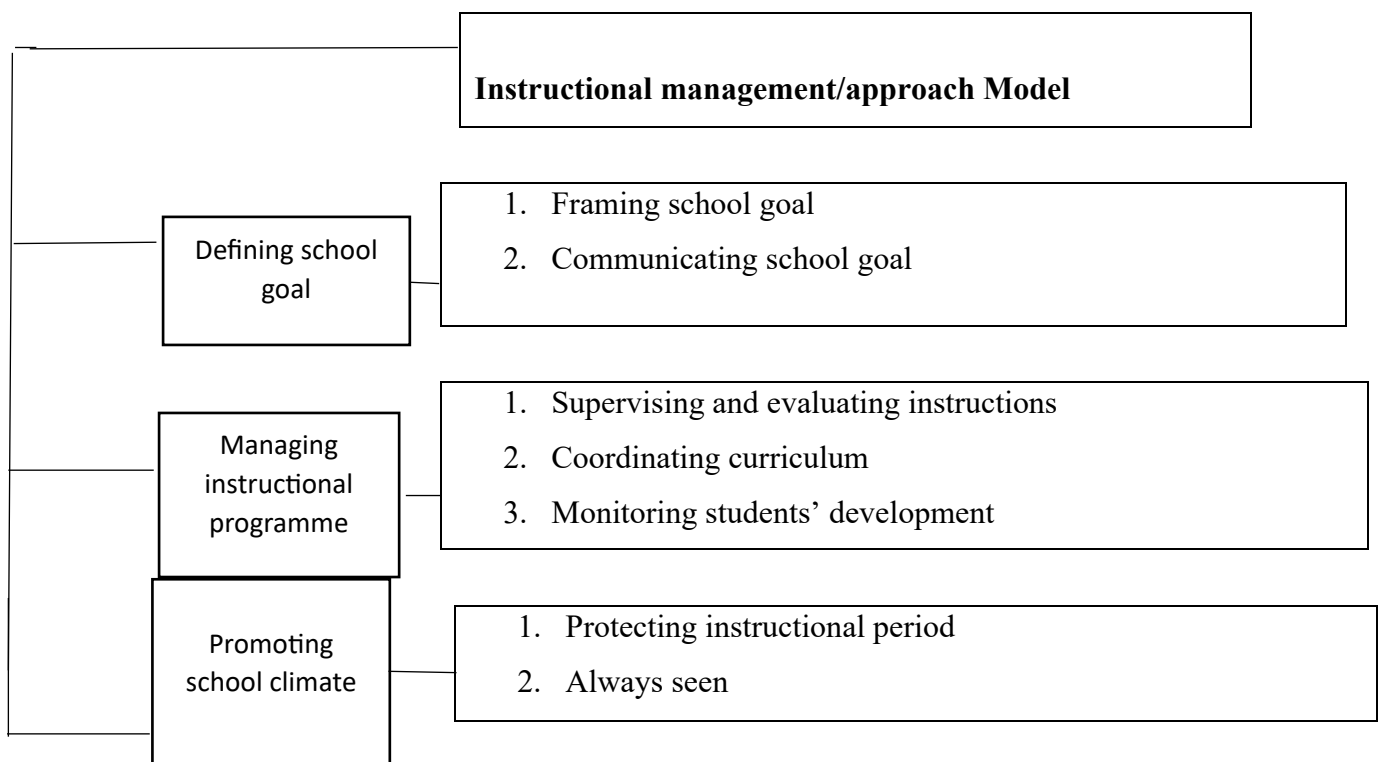
Furthermore, the latter studies affirm that support allows the supervisees to feel like they can approach their school manager and express concerns without feeling less valued/capable during curriculum supervision using EdTech. This suggests that school managers should be perceived as driven by attitude perception in order to consider the supervisees' needs and interests to avoid supervisees being emotionally distressed. Further to this, the school manager should delegate some of the tasks regarding curriculum supervision using EdTech.

Moreover, delegation is defined as a management approach whereby a school manager empowers supervisees to exercise autonomy (Morton et al., 2018; Saab et al., 2021). In addition, a similar expression was claimed by Zadock (2023) as well as Luscombe et al. (2022) that delegation is whereby a school manager gives supervisees the authority to act on their behalf, accompanied by responsibility and accountability for results in relation to curriculum supervision using EdTech. Simply, school managers should be influenced by attitude perception to ensure that supervisees' interests, strengths, and weaknesses are acknowledged in curriculum supervision using EdTech. Furthermore, the delegation management approach gives a school manager the time and ability to focus on higher-level tasks when using EdTech resources for curriculum supervision (Botez, 2019; Stoker et al., 2022). The latter studies further affirm that delegating gives supervisees the ability to learn and develop new competencies and time management during the use of EdTech resources. Nevertheless, Agheshteh and Mehrpur (2021) agree with Pereira (2019) that delegating can lead to frustration, potential extra costs for supervisees' training, and cause a lack of supervisees confidence. This suggests that school managers should be driven by attitude to ensure that supervisees are given chances to develop and are highly motivated to perform tasks effectively. In addition, school managers should use the instructional management approach during the curriculum supervision process.

### **3.5.3 School manager as an instructional manager**

The instructional management approach is an approach/model of school management in which a school manager gives instructions to the supervisees to provide support and guidance in establishing best practices in using EdTech for curriculum supervision (Khan & Qayyum, 2019; Rossa et al., 2022; Suleiman et al., 2020). In addition, the latter studies further expressed that school managers employing this model of management instruct their supervisees and together they set clear objectives related to curriculum supervision using EdTech. This suggests

that school managers should draw from knowledge perception to draw from policy documents/manuals to enhance the achievement of curriculum supervision objectives. Furthermore, Ngcobo (2021), Hallinger (2010), and Nurabadi et al. (2022) declare three dimensions of the instructional management approach, namely: defining school goals, managing instructional programmes, and promoting school climate. In addition, the latter studies further expanded these three dimensions into ten instructional management behaviours and practices: framing school goals, communicating clear goals, supervising and evaluating instruction, coordinating curriculum supervision, monitoring supervisees' development, protecting instructional time, maintaining high visibility, providing incentives for supervisees, promoting professional development, and promoting incentives for curriculum supervision using EdTech. Moreover, Masbur (2022) concurs with Hallinger and Murphy (1985) who created a table of instructional management approach/model with three dimensions and ten job descriptors as depicted in Figure 3.4 below. Further to this, this variant of instructional management approach/model brings to the fore a thoroughly comprehensive perspective on the concept of instructional management approach, specifically, leading curriculum supervision using EdTech in schools.



- |   |
|---|
| <ol style="list-style-type: none"><li>3. Providing incentives for teachers</li><li>4. Promoting professional development</li><li>5. Providing incentives for students' learning</li></ol> |
|---|

**Figure 3.4 Instructional Management Model (Masbur, 2022)**

Moreover, the first dimension in Hallinger and Murphy (1985) model/approach of defining the school goal includes the key job descriptors of framing school goals and communicating school goals. Furthermore, instructional school managers collaborate with supervisees to identify school-based areas for development in order to develop relevant and attainable school objectives (Hallinger & Murphy, 1985; Ngcobo, 2021). Further to this, the latter studies further expressed that the function of communicating school objectives to the supervisees refers to how the school manager conveys the importance of school objectives to supervisees during the use of EdTech resources for curriculum supervision. As such, school managers can achieve this using various communication models such as bulletin boards, policy manuals, and drawing from departmental circulars obtained through face-to-face/emails using EdTech resources. This suggests that school managers should draw from knowledge perception when using EdTech resources to acquire relevant knowledge from the education prescripts to work smoothly and jointly with the school supervisees when given instructions during curriculum supervision process to achieve curriculum supervision objectives.

In addition, the second dimension in the Hallinger and Murphy (1985), Hallinger (2010), and Ngcobo (2021) model refer to managing instructional programmes. Thus, is the core function of the management practices of instructional school managers. As such, managing the curriculum supervision, and instructional programme is a function closely related to the coordination of curriculum supervision utilising EdTech resources, evaluation/assessment of instruction, and monitoring supervisees' development (Ngcobo, 2021; Vinitwatanakhun & Sawatsupaphon, 2019). Furthermore, this duty necessitates that the instructional school manager take an active position in motivating, supervising, and monitoring curriculum supervision in the institution/school to use EdTech resources for curriculum supervision (Nadira et al., 2020; Sugesti et al., 2022). This suggests that school managers should be perceived as driven by knowledge perception to ensure they are equipped with the necessary

knowledge from policy manuals for managing anger, solving conflicts amicably among supervisees, and specifying sanctions when policy is infringed, this can be done to attain curriculum supervision objectives.

In addition, keeping a visible presence in the school, providing continuous praise and feedback to supervisees regarding their work, and ensuring the maintenance of assigned curriculum supervision time are aspects of the school manager's job description (Luiselli, 2015; Maguire et al., 2022; Reid et al., 2021). In other words, school managers should be driven by knowledge perception to employ different strategies obtained from policy documents that can enhance supervisees' enthusiasm/passion to perform to their utmost best with the use of EdTech resources for curriculum supervision. For instance, the policy (Employment of Educators Act 76 of 1998) articulates that a supervisee who has reached twenty consecutive years of service can be rewarded with twenty thousand Rand. Moreover, The task of curriculum supervision coordination is aimed at developing a platform for supervisee collaboration in order to match curriculum supervision delivery through the use of EdTech resources with the school's agreed goals/objectives (Freeman, 2019; McCafferty, 2021). Thus, instructional managers contribute to a favourable environment for supervisees in their schools by offering an online platform for supervisee participation during curriculum supervision (Pyhältö et al., 2023; Rambe & Mkono, 2019; Rankine et al., 2018). In other words, to be successful, school managers should use their networking abilities to foster a welcoming environment for curriculum supervision via EdTech resources.

Furthermore, the third function identified by Hallinger (2010) and Ngcobo (2021) in their approach is the development and promotion of a positive curriculum supervision climate. Further to this, according to the latter studies, instructional managers always maintain a positive school curriculum supervision atmosphere by encouraging supervisee collaboration, protecting the allocated curriculum supervision time, promoting professional development, maintaining high visibility, providing incentives for supervisees (awarded certificates for appreciation), developing high expectations and standards, and providing incentives for curriculum supervision using EdTech. As a result, it includes actions that are critical for promoting and maintaining a strong academic culture of continual development. In addition, behaviour and instructional management strategies underline the premise that effective schools survive in an academic atmosphere conducive to quality curriculum supervision using EdTech resources. This suggests that school managers should be influenced by knowledge perception to use

EdTech resources to make sure they obtain the required knowledge for conducting professional development and problem-solving skills that can enhance the full involvement of supervisees to promote professional behaviour during curriculum supervision using EdTech resources.

However, Kritikos (2018) and Lossec and Millar (2021) claim that four barriers prevent school managers from implementing an instructional management/approach, namely: a lack of understanding of curriculum supervision using EdTech resources and instruction, professional standards, school region/district expectations, and the role of diversity. In addition, another critique levelled against this model/approach derives from its reliance on focusing on curriculum monitoring/supervision using EdTech resources while ignoring other roles of school managers, such as reducing unprofessional behaviour among supervisees (Juma et al., 2021; Munna, 2023). This suggests that school managers should be influenced by skill perception to use EdTech resources to ensure they acquire relevant skills from their superiors to manage schools effectively and efficiently to achieve the desired aims of curriculum supervision.

#### **3.5.4 Summary**

Discussed in this chapter were school managers' perceptions of curriculum issues, the etymology definition of the word curriculum, levels curriculum supervision which are vertical, horizontal, and pragmatic curriculum. The study then unpacked the models of curriculum supervision as well as levels of school managers in curriculum supervision (transformational, instructional, and situational).

## CHAPTER FOUR

### Theorising the perceptions, procedure, and curriculum supervision in building theoretical framework.

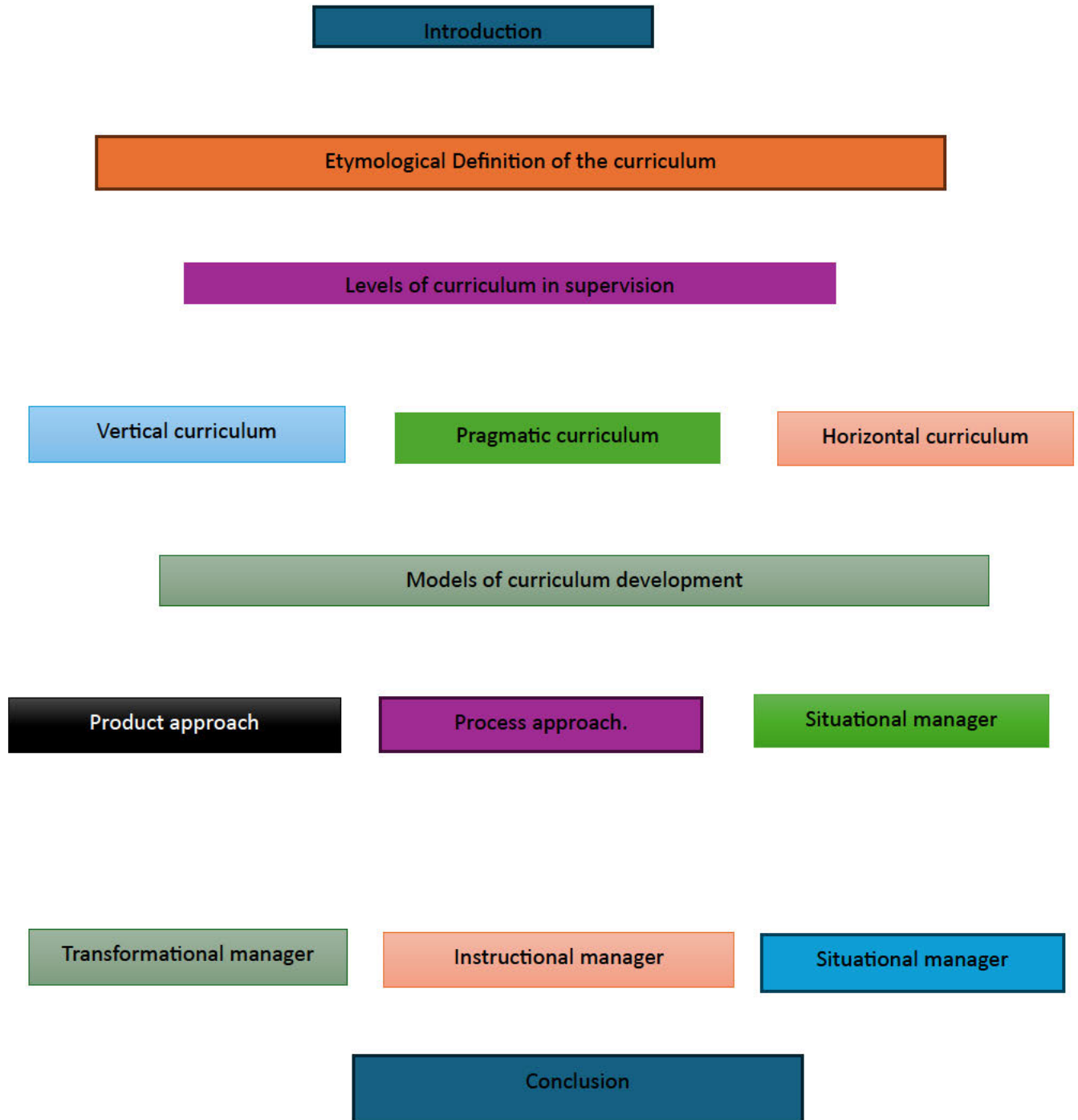


Figure 4.1 Mind Map for Chapter 4

## 4.1 Introduction

The previous chapter reviewed related literature concerning school managers' perceptions of curriculum issues. Moreover, the following aspects: introduction; etymological definition of the concept curriculum; levels of curriculum in supervision (vertical, pragmatic, and horizontal); and models of curriculum development (product, process, and political approach) were carried out. In this chapter, the theoretical framework, which guides the study, is presented. A study conducted by Nguyễn and Nguyễn (2020) as well as (Zuma, 2020) declares that a theoretical framework in a dissertation can be described as a metaphor, the blueprint of a house. In this research, the theoretical framework serves as the blueprint for the entire dissertation inquiry. Additionally, it guides and results in the construction and support of the study, which consists of the chosen theory that improves one's comprehension of and preparation for research on a certain issue (Osanloo & Grant, 2016; Zuma, 2020). This suggests that the theoretical framework considerably contributes to the development of new knowledge, provided that suitable procedures are followed. Additionally, this study's theoretical framework is referred to as the foundation upon which all knowledge is constructed. Thus, Technological Pedagogical Content Knowledge (TPACK) was used as an appropriate theoretical framework for this study because the ability to use Edtech in curriculum supervision requires school managers have sufficient knowledge.

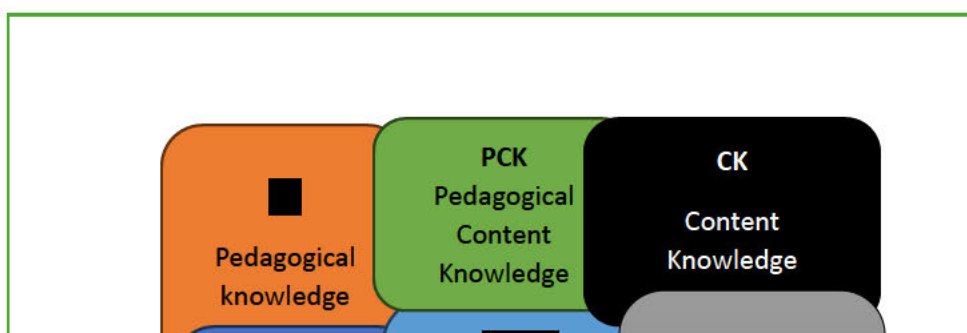
## 4.2 Etymological description and background of TPACK

The TPACK model was developed in 2006 by Punya Mishra and Mathew Koehler in technological pedagogical content knowledge (PCK) research (Koehler & Mishra, 2009; Koehler et al., 2014; Mishra & Koehler, 2006). In addition, according to Shulman, PCK was not something new because even as early as the 1950s, both content and pedagogy were regarded as one indistinguishable body of knowledge whereby content describes what is known to be taught and pedagogy describes how to teach (supervise curriculum) (Ekiz-Kiran et al., 2021; Nilsson & Vikström, 2015). Further to this Mishra and Koehler (2006) states that they based their initial idea on Lee Shulman's, *Those Who Understand: Knowledge Growth in Teaching* (1986). According to the latter studies, their theory was developed after five years of studying schoolteachers at all grade levels with experiments designed to see how their schools operated. Moreover, another researcher, Rick Marks (1990) explained that PCK represents a class of knowledge that is central to school managers' work and that would not typically be

held by, non-supervising content matter experts or by school managers who know little of that content (Gage, 2009; Mishra, 2019; WU, 2021). Further to this, according to the latter studies, school managers should be aware that PCK is required to effectively simplify and supervise content.

Furthermore, Shing et al. (2018) concur with Kultsum (2017) as well as Behling et al. (2022) that PCK is the integration between content knowledge and the pedagogical of the teacher in delivering a subject matter in accordance with the ability and interest of the learner. However, some studies defined the PCK as the learner's knowledge, pedagogical knowledge, and content subject matter knowledge (CK, PK). To address students' misconceptions about the subject they are learning, the PCK assists the lead teacher (Akinyemi & Mavhunga, 2021; Hlatshwayo et al., 2022). This suggests that school managers should be driven by both knowledge and attitude perceptions when supervising curriculum using EdTech to supervise curriculum properly and effectively as well as to address supervisees' personal interests and their thoughts to attain curriculum supervision goals. Further to this, according to more recent studies, subject matter knowledge, also known as content knowledge (CK), is the understanding of the topic that a teacher needs in order to instruct it. For instance, a school manager needs to be able to use tools and materials for curriculum supervision (like laptops) and understand them. The PCK concept therefore requires knowledge in this domain.

Moreover, Kultsum (2017) agrees with van Driel (2021) that another knowledge domain is pedagogical knowledge (PK). Furthermore, Shulman (1986) and Shulman and Sherin (2004) stated that PK involves the teaching of school managers and strategies that are applied in classroom management and organisation. In addition, the latter studies further state that PK also includes teachers' knowledge of students learning, assessment, and education purposes. Further to this, the integration of two knowledge domains can be described in Figure 4.2 as depicted below.



#### **Figure 4.2 Integration of two domains (PK & CK) (Mishra & Koehler, 2006)**

Moreover, content knowledge is the core knowledge of teachers in a particular subject and specific area (Coetzee et al., 2020; Schmid et al., 2021). In addition, Getenet and Callingham (2021) stated that content knowledge is the fundamental requirement for effective teaching. Thus, teachers' content knowledge influences the teaching and learning process, and it has a substantial effect on learners' achievement (Andyani et al., 2020; Rieu et al., 2022). Similarly, van Driel (2021) supports Li et al. (2022) that content knowledge is one of the essential requirements for teacher qualification. Further to this, Diehm and Hendricks (2021) declare that content knowledge influences effective practice positively. This suggests that school managers should be perceived as driven by knowledge perception to ensure that all the policies on curriculum supervision are observed and conformed. In addition, school managers should understand and apply pedagogical knowledge during curriculum supervision using EdTech.

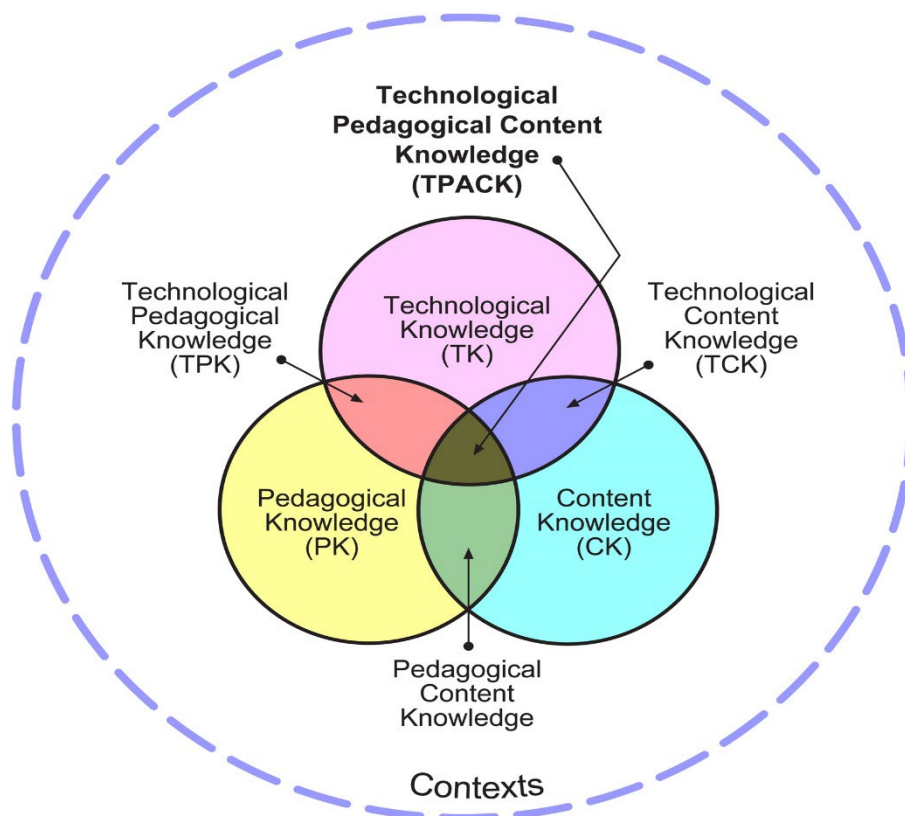
Furthermore, van Driel (2021) claims that pedagogical knowledge (PK) is another element within PCK. In addition, PK is extensive knowledge of the procedures, techniques, and approaches used in teaching and learning, and how they include, among other things, overall educational goals, values, and purposes (Alrwaished et al., 2020; Leijen et al., 2022). This suggests that school managers should draw from attitude perception to choose suitable methods/strategies that can cater to the supervisees' needs, values, and interests during the

curriculum supervision process. Furthermore, Kultsum (2017) advocates the ideas of Shulman (1986) that pedagogical knowledge is the knowledge, theory, and belief about the act of teaching and the process of learning, which figures the teachers' approaches in delivering subjects in the classroom. Further to this, latter studies further declare that the learning process also provides all activities from developing the materials, classroom management, learning habits, problem-solving, methodology, strategy, and assessment. This suggests that school managers should be influenced by attitude perception to ensure that supervisees are furnished with all the relevant material/tools according to their capabilities and the knowledge they possess.

Likewise, Celik (2023) asserts that PK enables teachers to understand the best suitable practices for a classroom setting. The latter study further claims that PK helps teachers know how different students learn and grasp information so that they can tailor their lessons to satisfy those needs. However, Connell (2019) concurs with Harvey (2020) that PK can be a biased and largely negative view, based on critiques of capitalism and capitalist schooling from tenured radicals. Moreover, the latter studies affirm that pedagogic criticism involves reading texts through teaching and teaching through texts. In so doing it aims to bring into focus the transaction between the study and interpretation of texts and the social forms and ritual of pedagogy.

Furthermore, the Technological Pedagogical and Content Knowledge (TPACK) framework builds on Shulman (1986) and Shulman (1987) description of PCK to describe how teachers' understanding of educational technologies and PCK interact with one another to produce effective teaching with technology (Koehler & Mishra, 2014). Further to this, Koehler et al. (2014) state that, in this approach, technology is introduced as a way to support and enhance the strategies already being used in the classroom. Moreover, studies on instructional uses of technology, however, have revealed that teachers often lack the knowledge to successfully integrate technology into their teaching and their attempts tend to be limited in scope, variety and depth (Harris et al., 2009). As a result, technology is used more as efficacy aids and extension devices. This suggests that school managers should be driven by skill perception to ensure that they get all the necessary skills for technology operation to meet the outcomes curriculum. In addition, similar concepts have been discussed in other studies, often with different labelling schemes. (Koehler et al., 2013). Moreover, Koehler et al. (2013) declare that the concept of TPACK described here has developed over time and through a series of

publications, with the most complete description of the framework found in Mishra and Koehler (2006) and Mishra and Koehler (2008). In Figure 4.3 below there are three main components of teachers' knowledge: content, pedagogy, and technology. Equally important to the model are the interactions between and among these bodies of knowledge, represented as PCK, TCK (technological content knowledge), TPK (technological pedagogical knowledge) and TPACK. In other words, the TPACK framework is made up of seven components displayed below.



**Figure 4. 3 The TPACK framework and its knowledge components (Mishra & Koehler, 2006).**

### 4.3 Content Knowledge

Content knowledge (CK) is teachers' knowledge about the subject matter to be learned or taught (Mishra & Koehler, 2006; Zuma, 2020). In addition, Koyuncuoglu (2021) supports Koehler et al. (2014) that knowledge of the content is of critical importance for teachers. As Shulman (1986) noted, this knowledge would include knowledge of concepts, theories, ideas, organisational frameworks, knowledge of evidence and proof, as well as established practices and approaches towards developing such knowledge. Furthermore, according to Farrow et al.

(2022), teachers should be familiar with the deeper knowledge fundamentals of the discipline they teach because knowledge and the nature of inquiry vary greatly between fields. For instance, in the case of mathematics, this would include knowledge of mathematics facts and theories, mathematical methods, and evidence-based reasoning. This suggests that school managers should be driven by knowledge perception to ensure that they know the content they are going to supervise. For instance, assigning subjects to learners using South African Schools Administration and Management System (SASAMS).

In addition, an action research study was conducted by Khoza and Biyela (2020) in South Africa, the purpose of the study is to explore and decolonise students' knowledge of technology, and pedagogical knowledge in the learning of first-year Bachelor of education mathematics. The students' knowledge reveals that TPACK was useful when used as a learning framework, which generated curriculum concepts for the module to support the student's knowledge of technology, pedagogy, and content. These concepts include content rationale, hardware resources, summative assessment, professional development (content), financial (accessibility), face-to-face (platform), instrumental time, content-based activities, and objectives. This suggests that school managers should be driven by knowledge perception to ensure that the curriculum supervision using Edtech is addressed and accomplished. In addition, teachers should be familiar with Technology Knowledge (TK) to apply the TPACK framework.

#### **4.4 Technology knowledge (TK)**

Technology knowledge refers to the knowledge about various technologies, ranging from low-tech technologies such as pencil and paper to digital technologies such as the internet, digital video, interactive whiteboards, and software programs (Haleem et al., 2022; Koehler et al., 2014). In addition, TK is always in a state of flux (more so than the other two core knowledge domains in the TPACK framework (pedagogy and content)). Thus, defining it is notoriously difficult (Adams et al., 2022; Koehler et al., 2013). The latter studies further state that any definition of technology is in danger of becoming outdated by the time this text has been published. However, Khoza and Biyela (2020) concur with Oliver and Townsend (2013) that TK is knowledge of any object or person that communicates curriculum supervision driven by skill perception such as societal rationale, software resources, peer assessment, mentoring (content), cultural accessibility, facilitation, online platform/environment, school time, school

managers'-centred activities and outcomes. This suggests that school managers should be driven by skill perception to avoid technology knowledge gaps during the process of curriculum supervision using EdTech resources. Moreover, certain ways of thinking about, and working with, technology can apply to all technological tools/resources (Adams et al., 2022; Koehler et al., 2013). Furthermore, the definition of TK used in the TPACK framework is close to the Fluency of Information Technology (FITness), as proposed by the Committee of Information Technology Literacy of the National Research Council (Council, 1999). The latter study argues that FITness goes beyond traditional notions of computer literacy to require that teachers understand information technology broadly enough to apply it productively at school and in their everyday lives. This suggests that school managers should be driven by skill perception to ensure that they acquire the necessary skills for using EdTech resources effectively and efficiently for curriculum supervision. Furthermore, see the results of the qualitative study conducted by Masilela (2019) in Pretoria exploring school managers' use of new technologies to supervise curriculum. The findings of the study revealed that school managers believe that using technologies is time consuming and that they still need support and training on how to use hardware resources (laptops, computers, tablets, mobile phones, and others); software resources (such as application programmes, websites, and others); and ideological-ware resources (thoughts, theories, and others) to supervise curriculum. This suggests that school managers should be driven by skill perception to ensure that they acquire appropriate skills from their colleagues, and from technology experts to implement technology effectively in their curriculum supervision.

However, the quantitative study conducted by Weinhandl et al. (2021) in Austria, the study aimed to report findings on the anticipated concerns and benefits of school managers who are required to integrate technologies into curriculum supervision. The findings of the study reveal that school managers in Austria feel capable enough to integrate technologies into their curriculum supervision and do not express the need for further training. This suggests that school managers were driven by skill perception since they were fully equipped with technology integration skills. Further to this, Weinhandl et al. (2021), as well as Yeo et al. (2020), declare that using technologies in curriculum supervision can assist in organising and structuring materials, demonstrating, and assessing supervisees' knowledge and competencies, improving communication between school manager and supervisees, working collaboratively/cooperatively, and providing feedback and guidance to supervisees. In

addition, school managers should also possess pedagogical knowledge to use EdTech resources to supervise curriculum.

#### **4.5 Pedagogical knowledge (PK)**

Pedagogical knowledge is teachers' deep knowledge about processes and practices or methods of teaching and learning (Mishra & Koehler, 2008; Santos & Castro, 2021). Moreover, the latter studies further declare that PK encompasses, among other things, overall educational purposes, values, and aims/goals. This generic form of knowledge applies to understanding how students learn, general classroom management skills, lesson planning, and student assessment (König & Kramer, 2016; König et al., 2021). Furthermore, Santos and Castro (2021) concur with Alam (2022) that pedagogical knowledge enables teachers to understand the best suitable practices for classroom settings. Similarly, the latter studies further state that PK helps teachers to know different learners and grasp information so that they can tailor their lessons to satisfy those needs. Moreover, Khoza and Biyela (2020) declare that PK is a combination of various curriculum concepts driven by attitude perceptions such as personal rationale, ideological-ware resources, formative assessment, extra-curricular/continuous activities, physical accessibility, leadership role, extra-time, blended platform/environment, informal activities, and aims. This suggests that school managers should draw from attitude perception to use the pedagogy that can address the supervisees' needs in their differences as well. As a result, no supervisee can feel neglected and isolated, and the quality of curriculum supervision can be rendered to supervisees. Further to this, school managers should be conversant with PCK for using EdTech resources. For instance, school managers can use South African Schools Administration and Management System (SA-SAMS) to upload and capture the mark schedule and attendance registers for both learners and supervisees. This suggests that school managers should be perceived as driven by attitude perception to ensure that the supervisees' identities, personal needs, as well as gender, are addressed to enhance the TPACK framework during curriculum supervision using EdTech resources.

#### **4.6 Pedagogical content knowledge (PCK)**

Pedagogical Content knowledge refers to the content that deals with the curriculum supervision process. PCK is different for various content areas, as it blends both content and pedagogy with the goal being to develop better curriculum supervision practices in the content areas (Mishra

& Koehler, 2006; Zuma, 2020). Further to this, PCK is the notion of the transformation of the subject matter for teaching. Specifically, according to Shulman (1986), this transformation occurs as the school manager interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional material to alternative conceptions and supervisees' prior knowledge. This suggests that school managers should be influenced by both knowledge and attitude perceptions so that they can address individual needs and educational policies. In other words, the combination of addressed individual needs and knowledge gained from policy documents can enhance curriculum supervision positively. Moreover, PCK covers the core business of teaching, curriculum supervision, and assessment and reporting such as the conditions that promote learning and the links among curriculum supervision, assessment, and pedagogy (Mishra & Koehler, 2006; Nhlongo, 2020; Shulman, 1987). Simply, school managers' work would be impossible without these strongest links (pedagogy and content knowledge) in the curriculum supervision system. The latter studies further assert that awareness of common misconceptions and ways of looking at them, the importance of forging connections among different content-based ideas, supervisees' prior knowledge, and alternative curriculum supervision strategies are all essential for effective curriculum supervision. In addition, school managers should seek the TCK skills and knowledge for using EdTech resources.

#### **4.7 Technological content knowledge (TCK)**

Technological content knowledge refers to the knowledge of how technology can create new representations for specific content (Koehler et al., 2014). It suggests that school managers understand that, by using specific technology, they can change the way supervisees practice and understand concepts in a specific content area. Moreover, latter studies further declare that technology and content knowledge have a deep historical relationship. Progress in fields such as medicines, archaeology, and physics have coincided with the development of new technologies that afford the generation, representation, and manipulation of data in new and fruitful ways. This suggests that school managers should be driven by both skill and knowledge perception to ensure they obtain technological skills to function effectively while driven by the relevant policies to enact curriculum supervision using EdTech and ensure that they do not deviate from the objectives of intended curriculum supervision. Furthermore, technological changes have also offered new metaphors for understanding the world. Likewise, Koehler et al. (2014) concur with Koehler and Mishra (2009) that understanding the impact of technology

on the practices and knowledge of a given task is critical to developing appropriate technological tools for curriculum supervision such as creating Zoom meetings with supervisees to develop subject improvement plans. This suggests that school managers should draw from skill perception by using skills obtained from society to create links for Zoom meetings as well as influenced by knowledge perception when developing a subject improvement plan as stated by the policy that after each term supervisee should employ strategies to improve learners' performance.

Similarly, TCK is an understanding of how technology and content influence and constrain one another (Fransson & Holmberg, 2012; Huang et al., 2022). Furthermore, the latter studies claim that school managers need to master more than the subject matter/content matter they supervise, they must also have a deep understanding of the way the subject matter can be changed by the application of technologies. According to Tamaro and D'Alessio (2016) as well as Rahmadi et al. (2020), school managers need to understand which specific technologies are best suited for addressing subject-matter learning in their domains and how the content dictates or perhaps even changes the technology. This suggests that school managers should be influenced by both skill perception and knowledge perception to ensure that they get capacitated by former colleagues to improve their creativity and innovative skills while practising the demands of the intended curriculum supervision objectives.

#### **4.8 Technological pedagogical knowledge**

Technological Pedagogical Knowledge refers to the knowledge of how various technologies can be used in curriculum supervision, and to the understanding that using technology may change school managers in curriculum supervision (Duraku & Hoxha, 2020; Hill, 2021; Koehler & Mishra, 2009). Moreover, Santos and Castro (2021) agree with Celik (2023) that TPK is an understanding of how teaching and learning can change when particular technologies are used in particular ways. In addition, the latter studies assert further that employing disciplinary and developmentally appropriate pedagogical design and strategy requires understanding the pedagogical affordances and constraints of a variety of technological tools. This suggests that school managers should draw from both skill and attitude perception to be enabled to use technological skills obtained from technological experts and choose the best methodologies that can be appropriate to supervisees' needs and their self-identities. Thus, to

build, TPK, a deeper understanding of the constraints and affordances of technologies and disciplinary contexts within which they function is needed (Archambault, 2016; Redmond & Lock, 2019). For instance, consider how shot throw may be used in a computer lab to project analysis of results because results can be editable and font is also adjustable, thus, it requires knowledge of using it. School managers should be able to implement the TPACK framework in their practices.

#### **4.9 Technology, pedagogy, and content knowledge (TPACK)**

TPACK is an emergent form of knowledge that goes beyond all three core components (content, pedagogy, and technology) (Koehler & Mishra, 2009; Koehler & Mishra, 2014; Koehler et al., 2013). The latter studies further assert that TPACK is an understanding that emerges from interactions among content, pedagogy, and technology knowledge. In addition, TPACK, or different knowledge of each of the three concepts individually, underpins truly meaningful and profoundly skilled teaching with technology (García et al., 2022; Koehler et al., 2013). The latter studies further declare that effective teaching with technology is based on TPACK, which calls for knowledge of how concepts are represented using technologies, including pedagogical techniques that use technology to teach content, understanding of what makes concepts difficult or easy to learn, understanding of how technology can help supervisees overcome some of their challenges, understanding of supervisees' prior knowledge and theories of epistemology, and knowledge of how technologies work. This suggests that school managers should be driven by three levels of perceptions (attitude, skill, and knowledge) to ensure that curriculum supervision using EdTech resources is implemented effectively and efficiently to produce the desired goals.

Furthermore, Koehler et al. (2014) assert that the TPACK framework has been developed independently and indirectly out of the PCK framework based mostly upon Shulman's 1986 model of PCK. Similar frameworks include (but are not limited to): ICT-Related Pedagogical Content Knowledge (ICT-Related PCK), Knowledge of Educational Technology, Technological Content Knowledge, Electronic Pedagogical Content Knowledge (ePCK), and Technological Pedagogical Content Knowledge-Web (TPCK-W). This suggests that school managers should be influenced by skill perception to gain capacitation from society and adapt to the new developments of technology regarding the use of the TPACK framework.

In addition, Mishra and Warr (2021) declare that given the range of tools available, as well as the pace at which technology evolves, successfully supervising curriculum with EdTech resources requires more than technological knowledge. Further to this, latter studies declare that school managers' needs include knowledge, skills, and attitudes (KSA), to successfully integrate technology in their curriculum supervision. Moreover, Mishra and Koehler (2006) claim that with TPACK as a conceptual structure, this special issue addressed three concepts related to school managers' technology-related KSA. The latter studies move on to stating that the impact of school managers' KSA, assessing KSA, and fostering KSA, importantly emphasise specific technological tools such as problem-solving with digital tools, selecting appropriate digital media and content, and integrating content and pedagogical knowledge. This suggests that school managers should be influenced by knowledge, skill, and attitude perception to ensure that curriculum supervision using EdTech resources is fruitful and yields expected goals.

Moreover, Mishra and Warr (2021) declare five spaces for design in education (curriculum supervision). These spaces are as follows artifacts, processes, perceptions, systems, and culture. However, they also must be sensitive to and work within systems and culture, and they are often challenged to incorporate new artefacts into their schools (Steadman & Millington, 2022). Similarly, Karakose et al. (2021), as well as Snell and Morris (2022), declare that as systems and cultures mutate, and as new technological artefacts exhibit potential for educational application, school managers must adjust their knowledge, practices, and skills accordingly. The table below depicts definitions and examples of the five spaces for design in education.

**Table 4.1 Definition and examples of five spaces for design in education (Mishra & Warr, 2021)**

Space	Definition	Example
Artifact	Stable objects that can be perceived through the senses	Apps, devices, software, videos

Processes	A procedure or directions that can be used to achieve a goal outside of the context within it was created	Online curriculum supervision, submission procedures, learning management system organisation, daily work schedule
Perceptions	A piece of time with associated sights, sounds, feelings, and thoughts	Online activities (asynchronous and synchronous, synchronous staff meetings, IT systems)
Systems	An organised and purposeful structure of interrelated and interdependent elements	IT systems, school format requirements (required instructional time, standards for in-person and online instruction, budgets)
Culture	A pattern of shared basic assumption that allows groups to perceive and interpret the world in similar ways, develop and communicate meaning, and transmit values to new group members	Perceptions of technology, schools, and education broadly, supervisees' beliefs about online curriculum supervision, and societal expectations of the role of the school.

In addition to the above, the five spaces framework allows school managers to also understand processes, systems, and cultures that may work against school managers' best intentions (Mishra & Warr, 2021). The later studies further declare that spaces help school managers to recognise that sometimes the barriers may be outside of the school context, and successfully navigating these barriers may require knowledge, skills, and attitude in this special issue is of critical importance.

#### **4.10 The context of the TPACK application**

Various studies in different contexts use TPACK as a framework. For example, the study conducted in the USA by (Evans, 2001), the study focused on the conception of technology integration in the classroom. The study argues that we assume that the new generation of teachers is well-equipped with knowledge of technology usage. Additionally, it is believed that teachers can use word-processing software, email processors, the web, and much more. Nevertheless, they doubt their skills and abilities to integrate technology into their classrooms. Moreover, the study sought to determine how well teachers used technology for both personal and professional purposes. As a result, the study concludes that teachers currently use technology for personal or work-related purposes. Further to this, teachers are more confident using technology for attitude perception than when for technology for knowledge perception. As a result, when using technology, teachers rely more on pedagogical knowledge (PK) than content knowledge (CK). This suggests that school managers should be perceived as driven by attitude perception rather than drawing from knowledge perception when integrating technology into their curriculum supervision using EdTech resources. Moreover, a qualitative study conducted by Jang and Chen (2010) in Taiwan. The main objective of the study is to examine the impact of a transformative model of integrating technology and peer coaching for developing TPACK of pre-service science teachers. The findings of the study reveal that the model could help pre-service teachers develop technological pedagogical methods and strategies of integrating subject-matter knowledge in science lessons, and further enhanced their TPACK. This suggests that school managers should be driven by all levels of perception to achieve the goals of curriculum supervision using EdTech. In other words, school managers should be knowledgeable in all knowledge domains required for TPACK implementations to accomplish curriculum supervision using EdTech resources.

Likewise, the quantitative study conducted by Koehler and Mishra (2009) at the Michigan State University, in East Lansing, USA, the purpose of the study was to develop and validate an instrument designed to measure pre-service teachers' self-assessment of their TPACK and related knowledge domains included in the framework. The findings of the study indicate that this is a promising instrument for measuring pre-service teachers' self-assessment of the knowledge domains. This suggests that school managers should draw from all levels of perception when supervising curriculum using EdTech resources to meet the goals of curriculum supervision. Similarly, the survey study conducted by Archambault and Barnett (2010) at Arizona State University, Mary Lou Folton Teachers College. The purpose of the study was to examine the nature of TPACK using a factor analysis by using a survey with 24

items to measure each of the areas described by the TPACK framework and measuring the responses of 596 online teachers from across United States. The findings of the study reveal that although TPACK is helpful from an organisational standpoint, the data from this study suggest that it face the same problems as that PCK is that it is difficult to separate out each of the domains, calling into question their existence in practice. This suggests that school managers should not only be influenced by knowledge perception because if they are missing both PK and TK, they also cannot accomplish the goals of the curriculum supervision using EdTech resources. In other words, if both PK and TK are missing the TPACK framework could be imperfect.

Furthermore, see the quantitative study conducted by Yigit (2014) at Purdue University. The main purpose of this study was to investigate and analyse the articles in mathematics education research that have explored how pre-service mathematics teachers (PSMT) develop their TPACK and how their developments impact their future teaching of mathematics. The findings show that PSMTs' active involvement in technology-enhanced lessons or courses is the major strategy to develop TPACK and to improve their future teaching of mathematics. This suggests that school managers should be well-informed in the TPACK framework to supervise curriculum using EdTech resources effectively and how to integrate technology in their curriculum supervision. In other words, school managers should be perceived as driven by all levels of perceptions.

Likewise, the survey study conducted by Redmond and Peled (2015) at the University of Southern Queensland, Australia and at Western Galilee College, Israel, this study aimed to identify if there are any contextual differences between the levels of TPACK in pre-service teachers from two different countries (Australia and Israel). Comparing Israel and the Australian pre-service teachers indicates that there is a similarity in the TPACK components reported by the pre-service teachers with low levels of TK and TPK. These findings indicate that there are limitations in the teacher programmes and that more attention should be provided to TK and TPK regarding preparing pre-service teachers to teach in the contemporary classroom. The findings of the study indicate that there are limitations in the pre-service teachers' training programmes and that more attention should be provided to TP and TPK about preparing pre-service teachers. This suggests that school managers should not be motivated by knowledge perception only because if both skill and attitude perceptions are lacking when they supervise curriculum using EdTech resources the curriculum supervision goals could be

unsuccessful. Moreover, see a study conducted by Koehler et al. (2013) at Michigan University, in the USA. The study aimed to describe the kinds of knowledge needed by a teacher for effective technology integration (TPACK). The development of TPACK by teachers is critical to produce effective teaching. The findings of the study reveal that the interaction of these bodies (content, pedagogy, and technology), both theoretical and in practice, produces the types of flexible knowledge needed to successfully integrate technology use into curriculum supervision. This suggests that school managers should balance the three levels of perceptions to integrate the three bodies of knowledge to attain curriculum supervision goals when using EdTech resources. In addition, the survey study conducted by Kartal and Çınar (2018) in Malaysia. The main aim of the study was to investigate how and why elementary mathematics pre-service teachers' (PTS) beliefs about TPACK changed during a method course and field experience. The findings of the study showed that the most important factor, which has the most effect on PTS's beliefs, is their experiences with learning and teaching technology in a similar way to another research. This suggests that school managers should be motivated and influenced by all levels of perceptions to attain curriculum supervision goals when using EdTech. Simply, school managers need to be well capacitated with all knowledge domains required for curriculum supervision using EdTech resources.

In addition, the qualitative study conducted by Mpungose (2020b) in UKZN, South Africa, the main objective of the study was to explore student teachers' knowledge in the teaching of CAPS subjects. The study revealed that student teachers are good at standard content, pedagogical, and technological knowledge while having no notion of advancing knowledge that caters for 4IR. This suggests that school managers should not apply the imbalanced levels of perceptions. In other words, for the school managers to achieve outstanding goals of curriculum supervision results they need to balance their technological knowledge to prepare for 4IR demands in their curriculum supervision when using EdTech resources. Similarly, see the qualitative study conducted by Mpungose (2017) in South Africa, the main purpose of the study was to explore lectures' reflections on the teaching of Physical Science modules using the Moodle learning management platform (LMP) at a South African University. The findings of the study revealed that if school managers can be driven by all levels of perceptions (knowledge, skill, and attitude) when using EdTech resources to supervise curriculum, their practices could be outstanding. Furthermore, see the quantitative study conducted by Kim and Lee (2017) in the Republic of Korea. The study aimed to investigate and complement the ways of improving the TPACK programming (TPACK-P) and verify the improved programme's

effect on pre-service teachers' TPACK. The findings of the study revealed that pre-service teachers had difficulties in the process of learning programming, designing curriculum supervision tasks, and developing programmes in the TPACK-P school. In addition, the findings also showed that it was more effective in improving the TK than ICT based TPACK educational programme was. This suggests that school managers should ensure they are driven by all levels of perception when supervising curriculum using EdTech. Thus, the ways of improving TPACK framework by school managers could highly complimented.

Similarly, a quantitative study conducted by Akyuz (2018) at the Middle East Technical University, Turkey on 138 pre-service Mathematics teachers obtained from a technology-integration, the main aim of the study was to shed light on three questions (1. How can school managers measure TPACK using performance assessment within a supervision environment? 2. Which components of the TPACK framework are identifiable in a such setting? 3. What type of correlation, if at all exists between performance and self-assessment scores?). The results of the study reveal that content knowledge was not covered, which is one of the most important components of TPACK as it addresses knowledge perception. As much as technology and methods (pedagogy) are important, these two are used as a delivery mechanism of the content. Thus, content is a vital component of TPACK. This suggests that school managers should draw from all levels of perceptions when supervising curriculum using EdTech resources. In other words, if school managers are failing to balance their levels of perceptions when supervising curriculum using EdTech resources their practices could not produce the desired goals. Further to this, see the quantitative study conducted by Lee et al. (2017) in British Columbia, Canada, the purpose of the study was to examine the effects of the TPACK-P education programme on the teaching expertise of pre-service teachers. The results of the study showed that the pre-service teachers in the ICT-based TPACK education programme showed a positive change in self-efficacy. This suggests that school managers should be influenced by three propositions of perceptions (attitude, skill, and knowledge) when supervising curriculum using EdTech. In short, school managers should be in possession of all three knowledge domains of the TPACK to excel in their curriculum supervision when using EdTech resources.

Likewise, the quantitative study conducted by Joo et al. (2018) in the USA, the main objective of the study was to investigate structural relationships between TPACK, teacher self-efficacy, perceived ease of use, and perceived usefulness for school managers who intend to use EdTech resources to supervise curriculum. The results of the study indicated that teacher self-efficacy's

TPACK significantly affected pre-service teacher self-efficacy and perceived ease of using EdTech resources to supervise technology. This suggests that school managers should be driven by all levels of perception in a balanced way when supervising curriculum using EdTech resources. In other words, the three domains of knowledge (content, pedagogy, and technology) should be knowledgeable by school managers in order to achieve the desired results during curriculum supervision using EdTech resources.

Moreover, a qualitative study was conducted by Khoza and Biyela (2020) in South Africa, the main objective of the study was to explore and decolonise students' knowledge of technological, pedagogical, and content knowledge in learning first-year Bachelor of Education mathematics. The study concluded that, although the technological and content knowledge dominated their learning, in other cases of the content curriculum supervision, the PK which was the result of their attitude perception to understand their identities, drove the content curriculum supervision. This suggests that school managers should be perceived as driven by all levels of perception to integrate technology effectively in their curriculum supervision using EdTech resources. Simply, school managers who use EdTech resources to supervise curriculum effectively and efficiently should be driven by all levels of perceptions. Furthermore, the quantitative study conducted by Bwalya and Rutegwa (2023) in Zimbabwe, the main purpose of the study was to assess and compare the TPACK self-efficacy of pre-service secondary school science and mathematics teachers. The study reveals that pre-service secondary school science and mathematics teachers have moderate signals of TPACK self-efficacy. This suggests that for school managers to achieve excellence in the TPACK framework signals should draw from all levels of perceptions when supervising curriculum using EdTech resources. Likewise, the qualitative study conducted by Tseng et al. (2022) in Asia. The purpose of the study was to explore the relationship between teachers' self-efficacy and TPACK in the context of educational information technology integration and focus on the moderating variables that affect the relationship. The study revealed that the relationship was moderated by the contests' career stage, but not by gender, teaching stages, disciplines, and measurement tools. This suggests that school managers should be driven by all prepositions of perceptions to achieve school managers' self-efficacy and TPACK integration in their curriculum supervision when using EdTech resources. In other words, the school managers should master the knowledge areas needed for the implementation of TPACK framework during the enactment of curriculum supervision using EdTech resources.

In addition, the quantitative study conducted by Susanti and Mukminin (2022) in Ulul Albab Tahfiz Model (TMUA) schools in Malaysia, the main objective of the study was to examine the effects of TK, PK, CK, PCK, TPK, TCK and TPACK instrument variables on physics, math, biology, and chemistry teacher candidates. The results of the study indicated that there was a positive relationship among the variables of TPACK. This suggests that for effective integration of all components of TPACK, school managers should be perceived as driven by all levels of perceptions. Simply, school managers should be well informed about all the components of the TPACK framework to attain the desired goals for curriculum supervision using EdTech resources. Moreover, a qualitative and quantitative study conducted (Ariyani et al., 2023) in Indonesia, the main objective of the study is to explore the TPACK skills of Lampung language teachers and the advantages and problems of online Lampung language classes. The results showed that Lampung Language teachers, in general, have mastered TPACK in their online classes such as the use of various learning media and educational platforms. This suggests that school managers should be driven by knowledge, skill, and attitude perceptions as well as be capacitated on how to integrate technology in their curriculum supervision using EdTech resources. In other words, for school managers to be outstanding in their curriculum supervision using EdTech resources they need to be well-capacitated with all the components of TPACK and its implementation for curriculum supervision.

#### **4.11 Limitations of the TPACK Framework**

Despite the paucity of the literature on this subject, there are a few potential studies that describe potential TPACK theoretical framework limitations. As a result, a narrative inquiry study was conducted by Taopan et al. (2020) in Surakarta, Indonesia. The purpose of the study was to explore and retell the story of an English teacher using the TPACK framework for teaching English. More specifically, the study intended to reveal the challenges and opportunities of using the TPACK framework in teaching English. The findings revealed that institutions or stakeholders should be aware of the need to support the teaching and learning process in the classroom with sufficient facilities. The findings of the study also revealed that English teachers experience difficulties/challenges in technology integration. This suggests that school managers should draw from all levels of perceptions when supervising curriculum using EdTech resources to support their curriculum supervision in their schools when using the EdTech resources and to ensure that technology integration is yielding the expected goals. In

addition, the qualitative study conducted by Ogbonnaya (2022) at Tshwane University on teachers' integration of technology in the teaching of market dynamics, the findings of the study revealed the TPACK limitations that Economics teachers' integration of technology had not improved learners' understanding of marketing dynamics graphs. The findings also show that Economics teachers were unsure of any other technology resources they could use to teach with and therefore are still thinking of how technology resources could influence the teaching pedagogy they use to teach Economics (market dynamics). This suggests that school managers should be driven to all levels of perceptions to supervise curriculum using EdTech resources to ensure they are in possession of all knowledge domains such as CK, TK, and PK as a prerequisite for technology integration.

Furthermore, a quantitative and qualitative study was conducted by Pangket (2022) in the Philippines, the purpose of the study was to investigate the integration of technology in the teaching and learning activities employed by language teachers. Though the language teachers integrate available technology in their class, it focuses more on exploring the contents than the pedagogical. The findings of the study show that they are more competent in their content and pedagogical knowledge. This suggests that school managers should be perceived as driven by all levels of perceptions to be guided correctly when using EdTech resources to supervise curriculum. In other words, the possession of all knowledge domains can assist school managers in supervising curriculum using EdTech resources without flaws and be able to achieve curriculum goals. Furthermore, The qualitative study conducted by Stoilescu (2014) in Australia, the main goal of the study is to describe challenges encountered by two secondary mathematics teachers when they try to integrate ICT devices into their classes. The findings of the study are based on using the TPACK context. The findings of the study reveal that some mathematics teachers might be fearful of technology. This suggests that school managers should draw from all levels of perceptions and ensure they are well capacitated to enhance competency on how to implement curriculum supervision using EdTech.

In addition, a quantitative study was conducted by Shafie et al. (2019) in Malaysia, the study intended to establish the relationship between TPACK and teachers' teaching of 21<sup>st</sup>-century skills in the classroom. The findings of the study reveal that there is a significant contribution to teachers' training, and that continuous professional and personal development among teachers are important to ensure a quality education for the students. This suggests that school managers should be influenced by all three prepositions of perceptions to meet the demands of

the 21<sup>st</sup> century during the curriculum supervision process when using EdTech resources. In other words, school managers should undergo capacity building for technology integration and knowledge domains required for curriculum supervision when using EdTech resources in holistic development. Furthermore, see the quantitative study conducted by Juanda et al. (2021) in Indonesia, the purpose of the study was to investigate the readiness of biology teachers to successfully face online learning based on their TPACK. The findings of the study indicate that biology teachers have sufficient TPACK skills in implementing online learning. This suggests that school managers must be driven by all levels of perceptions to supervise curriculum using EdTech resources to acquire an in-depth knowledge of technology integration. However, attitude perception is lacking. Simply, school managers should pay attention to three knowledge domains to attain curriculum supervision goals when using EdTech resources. Likewise, the qualitative study conducted by Putri et al. (2021) in Indonesia, the main objective of the study was to understand how physics pre-service teachers can apply TPACK to online and offline learning during COVID-19. The findings of the study show that physics pre-service teachers in offline learning have a slightly higher average value. Further to this, physics pre-service teachers in both conditions lack the skills in the TPK component. Thus, physics pre-service teachers need more practice to integrate technology in curriculum supervision. This suggests that school managers should be influenced by all prepositions of perceptions when supervising curriculum using EdTech resources to understand all prerequisites for technology integration in their curriculum supervision. Moreover, the qualitative case study conducted by Gunanto and Supriyadi (2021) in Indonesia. The purpose of the study was to expose the TPACK competence of pre-service teachers to enhance 10<sup>th</sup>-grade students' 21<sup>st</sup>-century skills in physics learning. The findings of the study show that pre-service physics teachers are still low in the content knowledge components and need to be improved in integrating curriculum supervision using technology properly. This suggests that school managers should be perceived as driven by all levels of perception to implement content, pedagogical, and technology knowledge perfectly when supervising curriculum using EdTech resources. In other words, school managers should ensure that they understand how to operate with the available EdTech resources for curriculum supervision. Moreover, see the mixed method study conducted by Alamri and Awjah (2023) in Saudi Arabia, the study aimed to explore the Saudi EFL teachers' view on using TPACK Model to improve students' vocabulary learning. The findings of the study revealed that EFL teachers were unsure in six statements if the TPACK Model might support EFL learners in learning vocabulary. This suggests that to benefit from the positive

effects of curriculum supervision when using EdTech resources the school managers should draw from all prepositions of perceptions.

#### **4.4 Benefits of the TPACK Framework**

In addition, see the systematic review conducted by Jiménez Sierra et al. (2023), authors from Spain and Colombia, the main objective of the study was to explore the trends associated with the development of TPACK from the lesson study model. The results reveal that understanding the literature shows that having a theoretical and practical understanding of the TPACK framework provides a contextualised opportunity for teachers to work on their training needs and interests, thereby promoting self-assessment and the construction of new conceptions about teaching with technologies. This suggests that the TPACK framework can be useful to the school managers provided they theorise about knowledge components of TPACK so that they can easily use EdTech resources to supervise the school curriculum. In other words, school managers should be influenced by all levels of perceptions to apply all knowledge components in curriculum supervision. Moreover, a mixed-method study was conducted by Inpeng and Nomnian (2020) at the University of Mahidol, Thailand, this study aims to integrate the use of Facebook into a Teaching English as a Foreign Language (TEFL) programme to promote students' goals of English language literacy pedagogical knowledge, and EdTech resources skills. The findings of the study reveal that, on average, Thai pre-service EFL teachers conduct TEFL classes using Facebook at a high level. Therefore, the findings reveal that the integrative vision of TPACK is the perspective that predominates the development of this type of study. This suggests that school managers should be influenced by all levels of perceptions to be able to integrate Facebook into their curriculum supervision. In other words, if the TPACK framework is used effectively by school managers to supervise curriculum they can be competent to incorporate different curriculum supervision styles when using EdTech resources which can lead to the attainment of curriculum supervision goals.

The quantitative study was conducted by Huang et al. (2023) in Canada, the purpose of the study was to explore the patterns of teachers' self-regulated learning (SRL) processes in the context of TPACK. The findings of the study reveal that TPACK can assist educational designers in developing interventions for promoting TPACK development by concentrating on teachers' SRL abilities. In other words, TPACK can assist even school managers in combining their knowledge of technology, content, and pedagogy to use EdTech resources to supervise

curriculum. This suggests that school managers should be driven by all levels of perceptions, as TPACK can assist in bringing developments in designing interventions for promoting curriculum supervision using EdTech resources. In addition, see the qualitative study conducted by Greenwood (2023) in Australia, the main objective of the study is to explore the authors' experiences and views of working as a librarian in higher education, within the Australian University context. Further to this, the findings of the study put forward the authors' use of reflective practice to enhance teaching and share experiences in using the TPACK framework to ensure reflective practice is focused. In other words, when employing EdTech, the TPACK framework is beneficial for curriculum supervision since it can assist school managers in comprehending the knowledge signals and usage of the accessible EdTech resources when motivated by all levels of perceptions (Khoza, 2017).

Moreover, see a qualitative case study conducted by Wolak and Kim (2023) in Canada, the study aims to deepen our understanding of digital screen-based pedagogical practices, attitudes, beliefs, and technologies used in one virtual school, particularly full-day Kindergarten (FDK) teachers. The findings of the study demonstrated that educators had a similar positive attitude towards technology in kindergarten as in other countries worldwide. This implies that school managers need to be sensitive to perceptions at all levels to grasp what material, pedagogy, and technological resources may be used to supervise curriculum utilising EdTech resources. For instance, school managers may use hardware resources (laptops) to give links to supervisees so they can join virtual meetings (Zoom meetings) and get clarification on how to improve curriculum delivery and meeting participation. Similarly, the quantitative study conducted by Cheng et al. (2022) at Taipei University of Education, Colombia, the main objective of the study is to investigate the effects of integrating the CloudClassRoom (CCR) and the Demo-CO-design/teach-feedback-Debriefing (DECODE) to improve pre-service teachers' online technological pedagogical and content knowledge (TPACK). The findings of the study show that DECODE with CCR provides an integrated process for improving school pre-service teachers' technological pedagogical and content knowledge (TPACK) assisting pre-service teachers in designing educational technology-integrated courses. This suggests that school managers should use balanced levels of prepositions to inform their knowledge of technology integration in curriculum supervision using EdTech resources to differentiate between hardware, software, and ideological-ware resources during curriculum supervision (Ndlovu, 2022b). For instance, school managers might utilise their expertise in technology pedagogy to

show supervisees how to sign into a Microsoft team and receive feedback on how to apply a rubric for marking and provide marks for comprehension tests.

Moreover, the quantitative study conducted by Du (2022) in China, the purpose of the study was to examine big data and interactive teaching modes and the design process of interactive teaching modes. Further to this, the study also examined and developed an English translation model based on TPACK and proposed the use of TPACK in abilities. The findings of the study reveal that the model is effective and promotes improvement of translation teaching levels. As TPACK can help school managers comprehend how to apply technology and its concepts for curriculum supervision using EdTech resources, it is suggested that school managers should be motivated by all levels of perceptions. In other words, if school managers have the three knowledge signals needed for the TPACK framework, they can be successful as suggested by (Mishra & Koehler, 2006) the curriculum supervision using EdTech can be enhanced. Likewise, the qualitative and quantitative (mixed method) study was conducted by Santos and Castro (2021) in Bulacan, Philippines, the main objective of the study is to evaluate the application of TPACK among pre-service teachers in different regions around Bulacan. The study reveals that pre-service teachers have a strong knowledge of the seven elements of TPACK. This implies that to successfully integrate their curriculum supervision using EdTech resources, school managers should be seen as influenced by all levels of perceptions. This is because TPACK has a great deal of potential for the development of school managers and is a theory that is pertinent to the world of technology (Koehler et al., 2013). For instance, school managers can assist supervisees to edit a circular sent via WhatsApp on the phone and send it back without printing it. For example, school manager can let supervisees modify a circular delivered over WhatsApp and send it back without printing it. Furthermore, the quantitative study conducted by Fahadi et al. (2022) in the Islamic University of Technology, Bangladesh, the objective of the study were to investigate the knowledge that engineering teachers should possess to effectively implement technology-enhanced instruction in their teaching practice using the TPACK framework, although its TPACK use in HEIs is inadequate. Moreover, the objectives of this investigation are to investigate what TPACK construct is used in engineering education and to study how different attributes of a teacher affect their level of TPACK knowledge. The outcome of this investigation confirmed the practicality of the framework and discovered significant differences regarding TK, conventional knowledge (PK/PCK) in the field of study of the teacher, and in technology-enhanced instructions regarding age group of the teacher. This shows that school managers can accomplish favourable outcomes when using

EdTech resources during curriculum supervision if they are pulling from all levels of perceptions, and they can also become more technologically advanced, especially in knowledge. For instance, school managers can help supervisees develop by showing them how to use Google to look for content to teach in order to increase their knowledge of that specific subject rather than relying on only textbook.

Likewise, the quantitative study conducted by Nilsson (2022) in Spain, the purpose of the study is to capture and understand how student teachers integrate digital technologies into their science teaching. The results of the study demonstrate that TPACK helped student teachers to reflect on their teaching science with the use of digital technologies and made explicit how technology, content, and purpose are closely linked in curriculum supervision. When using EdTech resources, the TPACK framework enables school managers to evaluate and reflect on their curriculum supervision. As a result, it is supported that TPACK recognises the crucial intersection between technology, pedagogy, and content (Aldemir Engin et al., 2023). In addition, see the quantitative study conducted by Susanti and Mukminin (2022) in Ulul Albab Tahfiz Model (TMUA) schools in Malaysia, the main objective of the study is to examine the effects of TK, CK, PCK, TPK, TCK, and TPACK instrument variables on physics, maths, biology, and chemistry teacher candidates. The results of the study show that there was a positive relationship among variables of TPACK. Similarly, TPACK is an ideal framework for all aspects of curriculum supervision using EdTech resources, which are all important in the curriculum supervision process (Megahed & Hassan, 2022). In other words, employing EdTech resources, the TPACK framework addresses all levels of perceptions during curriculum supervision because it provides school managers with three knowledge domains to consider (technology, pedagogy, and content knowledge) (Graham, 2011; Koyuncuoglu, 2021).

#### **4.5 Summary**

This chapter discussed TPACK as a theoretical framework of the study, background of TPACK, weaknesses and the strength of TPACK, integrated TPACK previous studies, and contextualisation of TPACK in different contexts.

## **CHAPTER FIVE**

### **Research design and methodology.**

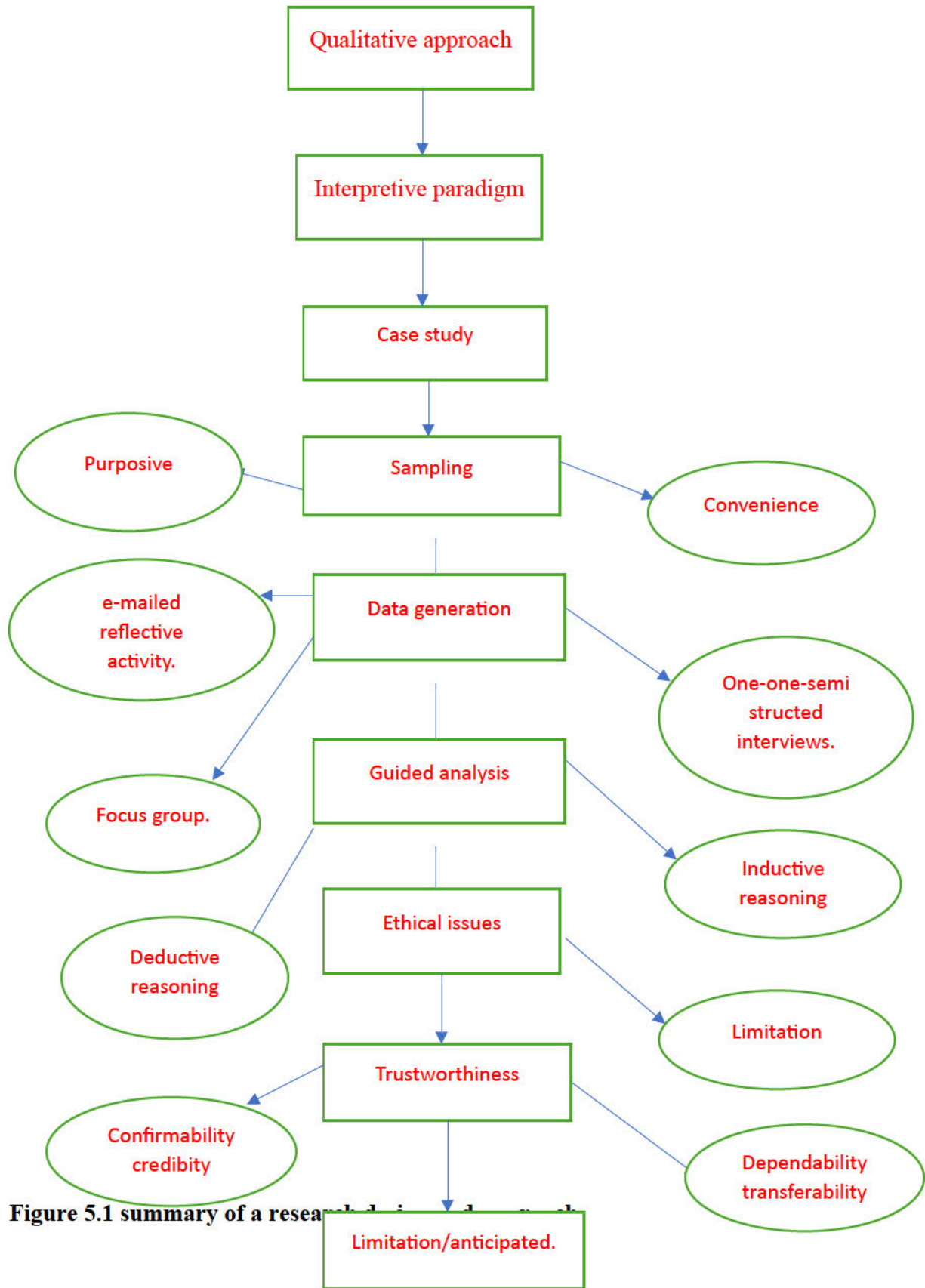


Figure 5.1 summary of a research methodology process.

## 5.1 Introduction

I explored the theoretical framework's elements in the previous chapter and introduced the TPACK theory, which serves as the foundation for this study. The study's phenomena which are knowledge perception, attitude perception, and skill perception are also closely connected with the components on a key level with each of these three levels of perception. Furthermore, the advantages and disadvantages of incorporating the TPACK framework into curriculum supervision using EdTech, as described in the study, were thoroughly explored in the preceding chapter along with studies that have used it.

In addition, utilising the required research benchmarks that provide worth and meaning to this study, is also crucial if research objectives are to be met and research questions are to be answered clearly. Further to this, these benchmarks are as follows 1. Critical paradigm, 2. Phenomenological research study, 3. Sampling, which includes convenience sampling and purposive sampling, 4. Data generation, which includes zoom reflective activity, zoom focus group, and zoom one-on-one semi-structured interviews, 5. Guided data analysis, which includes deductive and inductive analysis, 7. Ethical issues and trustworthiness which include confirmability, dependability, credibility, and transferability, and 8. Limitations of the study.

Thus, this study aims to explore school managers' perceptions of the use of EdTech resources to supervise curriculum, through the following objectives.

- 1.To understand school managers' perceptions of the use of technological resources to supervise the curriculum.
- 2.To explore why school managers have perceptions on the use of technological resources to supervise curriculum.
- 3.To explore school managers' perceptions of the use of technological resources to supervise curriculum.

To achieve the above objectives, this study intends to answer the following questions.

1. What are school managers' perceptions of the use of technological resources to supervise the curriculum?
2. How do school managers perceive the use of technological resources when supervising the curriculum?
- 3.Why do school managers perceive the use of technological resources in supervising curriculum in the manner that they do?

## 5.2 What is Research?

Liamputtong (2019) concurs with Aulls and Shore (2023) that research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way to generate new concepts, methodologies, and understandings. Additionally, the latter studies indicate that the goals of research implicitly assume that it can uncover something novel or contribute uniquely to the advancement of knowledge. In contrast, Kabir (2016) claims that the word research originated from the old French word *recherchier* meaning to search and search again. It indicates going back and looking for something again, which implies that the initial search wasn't thorough and full and that there's still room for development. The latter study goes on to say that a search for knowledge is what is meant when the term "research" is used. Moreover, research is the methodical, scientific quest for relevant knowledge about a given subject or field (Mengist et al., 2020). Similarly, Jreisat et al. (2021) concur with Brennan (2018) that research is an art of scientific exploration. However, Thomas et al. (2021) share a similar idea with Normand (2016) that research is a methodical scientific strategy for addressing a topic, resolving an issue, or producing fresh knowledge through the systematic and orderly gathering, organisation, and analysis of data with the ultimate objective of enhancing the decision-making value of the research.

Furthermore, in summarising the research definition, first and foremost, this indicates that research contains formal methodical steps to be followed in the information-seeking process in order to find facts or truth about the phenomena being studied (in this case, the phenomenon being school managers' perceptions on the use of EdTech) (Mpungose, 2017; Pisula, 2020). Further to this, this part of the definition appears to take an academic knowledge-based approach to knowledge perception, rather than an everyday knowledge-based approach (Mogoş & Bodea, 2019; Zajda, 2019). Secondly, research is focused on gathering evidence from a variety of sources, such as participants, to inform the development of facts, and this aspect of research definition appears to be influenced by skill perception because evidence is subjectively produced by what others say (perception) (Johnston & Baker, 2022; Lam & Schubert, 2019). Lastly, the third element of the definition focuses on attitude perception, where research is centred on presenting greater insight in conjunction with the researcher's interpretation of findings. (Maree, 2010; Mpungose, 2017). This suggests that the study

definition tackles issues of knowledge perception (systematic processes), skill perception (data collecting), and attitude perception (information analysis and interpretation). In conclusion, Kabir (2016) affirms that systematic research in any field of inquiry involves three basic operations:

- 1.Data collection: refers to observing, measuring, and recording data.
- 2.Data analysis: refers to arranging and organising the generated data so that we may be able to find out what their significance is and generalise about them.
- 3.Report writing: an inseparable part and an outcome of a research study. Its purpose is to convey data contained in it to the readers or audience.

Thus, in the context of this educational research, is defined as a systematic finding of school managers' perceptions on the use of EdTech resources to supervise curriculum and make advancements in the science of curriculum supervision using EdTech resources. Thus, the study should utilise the research methodology that can achieve the objectives of the study.

### **5.3. Methodology and Research design**

#### **5.3.1 Qualitative Approach/Research**

A researcher must understand the purpose of their study to apply the proper research style and method of research to achieve the goal. In this instance, it's possible that some school managers were unprepared for the introduction of EdTech resources to supervise curriculum in schools. Further to this, some school managers can find it difficult to incorporate EdTech resources to supervise the curriculum. Others may have certain perceptions on the use of EdTech resources to supervise curriculum. Yet, their perceptions might not have been heard by the school managers. In addition, studying perceptions can assist school managers in becoming more knowledgeable about using EdTech resources to supervise curriculum in schools. Similarly, by encouraging school managers to employ EdTech resources without first gathering their perceptions about the programme before it begins to run, it can be possible to avoid the negative effects of those resources malfunctioning.

Maree (2013) and Boland et al. (2021) aver that qualitative research is based on a naturalistic approach that seeks to understand phenomena in real-life situations. Hence, the study employed a qualitative research approach that can facilitate the production of in-depth and rich data. Moreover, Cresswell (2013) concurs with Andreassen et al. (2020) that the use of qualitative research allows the researcher an opportunity to engage intensively with participants employing face-to-face interactions. Furthermore, the qualitative research approach produces a thick (detailed) description of participant's feelings, opinions, perceptions and experiences and interprets the meanings of their actions (Rahman, 2020). In addition, qualitative researchers are interested in people's beliefs, experiences, perceptions, and meaning systems from their own perspectives (Flick, 2022; Mohajan, 2018). Likewise, Ritzer and Stepnisky (2021) state that the root of qualitative research lies in social and cultural anthropology, philosophy, psychology, history, and sociology. According to Mohajan (2018), the goal and the purpose of qualitative research are to describe and interpret issues or phenomena systematically from the point of view of the individual or population being studied and to generate new concepts and theories. The latter study further asserts that the choice of methodology is directed by the questions being raised. Likewise, qualitative research is a situated activity that locates the observer in the world. In addition, Denzin et al. (2023) claim that qualitative research consists of a set of interpretive, material practices that make the world visible, and these practices transform the world. Similarly, Denzin et al. (2023) agree with Leavy (2014) that the epistemological landscape in qualitative research is as diverse and complex as the various disciplines that employ qualitative methods.

### **5.3.2 Strengths of a qualitative approach**

Moreover, Ndoziya (2014) and Merfeld et al. (2019) outline the strength of a qualitative approach that provides an in-depth, intricate, and detailed understanding of meanings, actions, non-observable as well as observable phenomena, attitudes, intentions, and behaviours, and these are well served by naturalistic enquiry. Hence, the rationale for choosing this approach is to explore the perceptions (non-observable phenomenon) of the school managers' perceptions on the use of EdTech resources to supervise the curriculum. Further to this, Mwita (2022) opines that qualitative research aims at understanding, explaining, exploring, discovering and classifying situations, feelings, and perceptions of a particular group of people. Moreover, King et al. (2021) claim that one of the strengths of the qualitative approach is the recognition that data must always be understood in relation to the context of their production.

In addition, the qualitative approach allows the researchers to discover the participants' inner perceptions and to figure out how meanings are shaped through and in culture (Rahman et al., 2022). Further to this, the latter study asserts further that the most common qualitative data-generation techniques are participant-observation, unstructured interviews, direct observation, and description recordings. Furthermore, because it may be formed and reconstructed to a greater extent, the qualitative research approach has a flexible structure (Ruslin et al., 2022). Thus, I demonstrated an interest in the process rather than the results of the research by developing a data-generation strategy that included school managers as participants to generate data based on their perceptions of using EdTech resources to supervise curriculum. This significantly contributed to the study's ability to provide a thorough description of the phenomenon.

Moreover, Tracy (2019) claims that researchers can put more effort into painting a larger picture of the phenomenon. This claim supports skill perception, and I tried to comprehend the participant's life in terms of cultural, linguistic, socioeconomic, and political elements that might have an impact on the participant's workplace. (Myeza & April, 2021; Stronach et al., 2016). Therefore, this study sought participant profiles after sending consent letters. Additionally, the study utilised user-friendly methods of gathering data like one-on-one semi-structured interviews, and I probed school managers to understand their perceptions of the use of EdTech resources in the context of curriculum supervision. I was also aware of how their work was organised and that they oversaw supervising the curriculum while conducting research. To get around this, I generated data on my own during their lunch break, free time, or after work.

Participants in qualitative research are treated as primary sources of data, implying that data gathering, including data analysis, is dependent on the discoveries made by the participants. In addition, it is important to note that participants are referred to as subjects rather than objects (Creswell & Poth, 2016; Fowler & Kress, 2018). Furthermore, Youyou et al. (2015) claim that data is generated using human instruments rather than questionnaires and machines. This emphasises the significance of social human beings collaborating in research for change and empowerment. In support of the preceding assertion, this study includes individuals rather than machines as participants. In short, data were generated mostly from school managers in order to understand their perceptions (phenomenon) of curriculum supervision using EdTech resources (Cagiltay et al., 2019). To comprehend their social behaviour, ideas, acts, and

experiences as well as their perceptions, this desired my skill perception. Hence, I wasn't pressuring my knowledge of the phenomenon on the participants.

In addition, qualitative research entails fieldwork, which necessitates that researchers visit the participants' site, location, or institution to observe and gather data in natural settings (Lofland et al., 2022; Van de Ven & Poole, 2017). Further to this, Krause (2017) agrees with Creswell and Poth (2016) that by getting first-hand information from participants in their native environments through fieldwork, assumptions about the study can be avoided. In other words, the study can feel and comprehend the social evils and challenges that the participants experience daily, which enables the study and the participants to develop solutions for the problems they encounter (Asher, 2020; Madden, 2021). Therefore, both knowledge and skill perception influence the fieldwork in qualitative research. In addition, it was also clear when I had to prepare semi-structured interviews for this gathering data and include participants in the field so that I could be adaptable in coming up with interventions or solutions for the process of unfolding the phenomenon (Gray, 2021; Muthukannan et al., 2020). This is why I visited the sites (schools) where EdTech resources were applied, using school managers to supervise the curriculum. I also participated in all phases of the crucial case study in an effort to address the school managers' resistance to employing EdTech resources to supervise the curriculum.

### **5.3.3 Weaknesses of a qualitative approach**

However, Bernstein et al. (2018) concur with Thomas et al. (2022) that the weaknesses of the qualitative approach are such that it produces findings not arrived at by statistical procedures or other means of quantification. Moreover, qualitative research tends to use small samples and may make the data collection process difficult and less manageable (Braun & Clarke, 2021a). In addition, replication in a qualitative study is indeed challenging since people have varied feelings, experiences, perceptions, and backgrounds, and therefore producing similar results may not be practical in some cases (Berman et al., 2017; Kelvin, 2022). Furthermore, Chirambwi (2023) agree with Spencer (2022) that participants in qualitative research may decide to deliberately create an environment that may force a researcher to record information that is not exact compared to the actual situation through voice tone and facial expression. As a result, In other words, the qualitative approach helped me to produce a thick (detailed) description of participants' feelings, opinions, and perceptions and interpreted the meanings of

their actions when using technology to supervise the curriculum. In addition, Rahman et al. (2022) assert that policymakers might not view conclusions from a qualitative approach with much confidence. In addition, Sovacool et al. (2018) declare that to avoid bias and subjectivity, it is wise to use multiple methods to balance any potential weakness that might have been raised in conducting the study. Following this view, Dai and Moffatt (2021) state that in a qualitative approach quoting words from the various participants presents different voices and reflects different perceptions, to ensure credibility. Thus, I used reflective activity, face-to-face semi-structured interviews, and focus group discussions to minimise bias (Heneghan et al., 2021). Moreover, I went through trustworthiness procedures of credibility, transferability, confirmability, and dependability in order to keep accuracy in this qualitative approach and the acceptance of quality work (Bengtsson, 2016; Rose & Johnson, 2020). Additionally, Creswell and Poth (2016) suggested that, in using these four factors of trustworthiness, I had to think beyond specific processes to recognise the lens I used in this study and the paradigm assumption I chose. Further to this, I used emerging settings that were adaptable to the people and locations under exploration, as well as inductive data analysis to establish patterns and themes (Mohajan, 2018). Thus, this study is not aiming to generalise but to take a natural setting (Kankam, 2019). These created natural situations and meanings are based on data interpretation rather than generalisation (Enders, 2022; Shuman et al., 2013). Furthermore, The qualitative research approach was chosen based on its suitability for the goal of this study (Smith & McGannon, 2018). As a result, in this study, I avoided interfering with the natural flow of the participants' behaviour in all of its details, the behaviour occurring spontaneously and holistically (Antwi & Hamza, 2015; Zuma, 2020).

#### **5.4 Interpretive paradigm and its philosophical assumptions on perceptions**

In addition, this study adopted an interpretive paradigm for various reasons. In support of this, see the study conducted by Alharahsheh and Pius (2020) at both the University of Greenwich and York St John University, London Campus, the study aims to explore key philosophical underpinnings of fundamental research paradigms concerning Positivism and Interpretivism. The study would furthermore, outline and provide key interrelationships with the following: Ontology, Epistemology, Methodology, and Method. The findings of the study revealed that the interpretivist paradigm would enable researchers to gain further depth by seeking experiences and perceptions of a particular social context. This suggests that by employing an

interpretive paradigm in this study, I gained a deeper understanding of school managers' perception of the use of EdTech resources to supervise curriculum.

Furthermore, Cohen et al. (2011) assert that for any research to be undertaken, a study must outline the paradigm underpinning it. Further to this, Avenier and Thomas (2015) and Mwita (2022) define a paradigm as a set of assumptions or beliefs about fundamental aspects of reality which give rise to a particular world view. This description of paradigm is in line with the definition by Parker-Jenkins (2018), May and Perry (2022) and Giorgi (1994) that a paradigm is a way of looking at or researching phenomena, a world view, a view of what counts as accepted or correct scientific knowledge, or a way of working; an accepted model or pattern. Thus, this suggests that a paradigm is a determined avenue, or a worldview used to generate and interpret the findings. Moreover, Antwi and Hamza (2015) assert that the interpretive paradigm looks for culturally and historically obtained interpretations based on an individual's social life and perceptions. In addition, before something can be fixed, it needs to be recognised first. Likewise, once school managers' perceptions on the use of EdTech resources to supervise curriculum are understood (whether favourable or bad), steps can be made to alleviate any challenges. Keeping in mind that different EdTech resources may be regarded differently by school managers due to their backgrounds. Moreover, it is critical that we first understand their perceptions as they may be influenced by their attitude, skill, and knowledge perceptions. Thus, this suggests that the interpretive paradigm could be used to explore the school managers' perceptions on the use of technological resources to supervise the curriculum. In other words, considering the school managers' perceptions, an interpretive paradigm could aid in addressing these perspectives. Furthermore, Lincoln and Guba (1985a) declare that the most valuable aspects entailed in this paradigm are ontology and epistemology, and axiology

#### **5.4.1 Ontology**

Moreover, De Castro (2019) supports Creswell (2014) that ontology is defined as a concept concerned with the existence of, and relationship between different aspects of society such as social actors, cultural norms, and social structures. Further to this, for Bhatti and Sulaiman (2022) as well as Al-Saadi (2014) ontology is the assumptions we make about the kind and nature of reality and what exists. In addition, Zoirov (2021) and Berryman (2019) also define ontology as the nature of the world and what we can know about it. As ontology is defined as

the nature of reality, this study relied on the idea that participants' lived experiences and perceptions of the world should be used to evaluate reality. As a result, this kind of ontological standing assumes that there are different realities, each of which is created by perception and experience. Furthermore, Pérez-Vázquez and Bonilla-Campos (2022) as well as Javillonar and Elma (2021) support each other when they claim that perceptions/experiences are continuous. Consequently, continuity is viewed as an ontological issue in a narrative inquiry. Further to this, Mayo (2022) argues that a narrative inquiry can reveal in-depth details of a situation or life experiences/perceptions. In addition, see the study conducted by Luo (2011) at Central China Normal University. The purpose of the study was to review qualitative research in the field of educational technology through the lens of ontology, epistemology, and methodology. The findings of the study reveal that three qualitative research methods are prevalent in the field of educational technology: ethnography, case study and design base research. In order to ensure ontology in this study, I used a case study and qualitative research, taking into account its characteristics, strengths, and limits. As a result, I overcame the constraints and capitalised on its strengths to secure the ontology of this study. This suggests that ontology in this study is aligned with Knowle attitude perception.

#### **5.4.2 Epistemology**

In addition, the term epistemology comes from the Greek word episteme, which means knowledge. Epistemology is the philosophy/theory of knowledge, or how we come to know things (Pritchard, 2023). Moreover, Creswell and Poth (2016) as well as Creswell (2014) define epistemology as the nature of knowledge. This study was based on school managers' perceptions, of how they construct and interpret meanings and symbols in the context in which they are located (Skinner et al., 2020; Ziakas & Boukas, 2014). In addition, Krauss (2005) concurs with Absolon (2022) that epistemology describes the methods employed to acquire knowledge while epistemology discusses how we come to know that reality. Further to this, Antwi and Hamza (2015) claim that epistemology poses the following questions: What is the relationship between the knower and what is known? How do we know what we know? What counts as knowledge? As a result, the constructivist viewpoint holds that knowledge is established through the meanings attached to the phenomenon under study, that researchers interact with study participants to gather data, that inquiry alters both the researcher and study participants, and that knowledge is context- and time-dependent (Antwi & Hamza, 2015; Levitt et al., 2017).

Moreover, conducting a qualitative study suggests that researchers try to get as close to the participants as feasible within an epistemological premise. Since these contexts are crucial for comprehending what participants are saying, qualitative researchers typically conduct their studies where respondents live and work (Creswell & Poth, 2016; Ormston et al., 2014). In ensuring epistemology in this study, I spent much quality time in the field to get to know and understand the participants and the phenomenon I was exploring: school managers' perceptions on the use of EdTech resources to supervise curriculum. Further to this, I was using an instrumental case study to explore school managers' perceptions of the use of EdTech resources to supervise curriculum. Mathorne et al. (2020) argue that an extended stay at the research location is necessary for a good case study. Thus, by cooperating with the participants and spending time in schools with participants gathering data, I tried to reduce the distance or objective separateness (Dutta et al., 2019; Salvador, 2016) between myself and those under inquiry. This suggests that epistemology in this study is aligned with knowledge perception because its processes require scholarly knowledge.

### **5.4.3 Axiology**

Moreover, the word axiology originated from *Axia*, a Greek word that signifies quality, value/esteem, which is a hypothesis of significant worth (Anwar et al., 2020). Furthermore, Danaher (2021) agree with Dewantara and Efriani (2020) that axiology is the branch of philosophy that studies values and how those values come about in a society. Further to this, Castleberry and Nolen (2018) agree with Creswell (2014) that all researchers bring value to the study, but qualitative researchers make their values known in a study. In addition, Anwar et al. (2020) claim that axiology intends to seek answers like: What is esteem? Are esteems fundamental? What is ethical quality? Whether profound quality defined by our activities or our considerations? What is beauty? What is wonderful? The latter studies further declare that axiology addresses our reasoning about what school managers ought to be and how they ought to act towards curriculum supervision using EdTech resources. Likewise, Skowronski (2018) argues that axiology addresses one of the fundamental needs of people; the requirement for aesthetic satisfaction.

Furthermore, Wood (2019) asserts that school managers in axiology are always drawing attention to what ought to be said and done, and how supervisees ought to behave. In addition,

Munir et al. (2019) affirm that axiology being the branch of philosophy deals with beauty, balance, and harmony in society. Consequently, Malatji (2022) in support of Henry (2023) that axiology is divinely verified, and socially accepted values, virtues and happiness are to be perceived in educational values in quest of harmony and balance in a chaotic era of pandemic (COVID-19). This suggests that the axiology in this study is aligned with skill perception.

#### **5.4.4.1 Strength of the interpretive paradigm on perceptions**

In addition, Rose and Johnson (2020) claim that the main strength of the interpretivist approach is that it is more humanistic for political study when compared to the positivist approach. The later studies further insist that instead of limiting the research questions to what is, the interpretivism approach through qualitative research understands the nature of human emotions. Similarly, Pham (2018) states that the interpretive approach is diversifying the views and the researcher cannot only describe objects, humans, or events but also deeply understand the variables and data in the social context. By using qualitative research methods, interpretivists can ensure a high level of validity in their research findings (Hays & McKibben, 2021). In addition, the researcher seeks to comprehend the participants' inner lives, which necessitates critical thinking. Likewise, the sociocultural element arises because it invites attitudes, thoughts, and viewpoints on phenomena (perceptions). This study attempted to elicit participants' inner thoughts about enacting and comprehending technological and pedagogical knowledge in curriculum supervision, as well as their views on the usage of EdTech resources as school managers.

Furthermore, in this study, I was able to see how participants interacted throughout the focus group discussion, and they displayed a grasp of the role performed by technological knowledge during the enactment process. In this manner, I was able to see how participants conveyed their opinions about the set of questions designed to elicit their perceptions/experiences.

#### **5.4.4.2 Limitations of interpretive paradigm**

However, one of the weaknesses of the interpretive paradigm is that the ontological view tends to be more subjective than objective (Rahman, 2017). Thus, the findings of the study may draw from the researcher's beliefs and biases (Kivunja & Kuyini, 2017). In this study, this could be addressed by describing data, displaying the process of data analysis, and describing how I reached the conclusions (Bertram et al., 2018). However, Kivunja and Kuyini (2017) assert

that one of the strengths of the interpretive paradigm is that by using diversified views to explore the phenomenon, the researcher is not limited to describing objects, events or humans, instead they can deeply understand them in a social context. Similarly, in this study, the interpretive paradigm helped to not only describe the perceptions of the school managers when they are supervising the curriculum using EdTech resources, but the paradigm offered an insight into what informs their perceptions to best understand their practices. Moreover, the main disadvantages associated with interpretivism relate to the subjective nature of this approach and the great room for bias on behalf of the researcher (Oancea & Punch, 2014; Thorne, 2016). Likewise, Ormston et al. (2014) affirm that primary data generated in interpretivist studies cannot be generalised since data is heavily impacted by personal viewpoints and values.

Furthermore, see the study conducted by Pervin and Mokhtar (2022) in Malaysia, the purpose of the study is to give a high-level overview of the interpretive research paradigm. The study begins with a summary of the components of the interpretivist research paradigm, with an emphasis on ontological and epistemological viewpoints from interpretivist researchers. Next, it addresses the challenges interpretivist researchers face while conducting research under the interpretivist paradigm and what characterises the components in this paradigm. The findings of the study reveal that the interpretivist paradigm is not devoid of its own set of obstacles and challenges. Moreover, not all participants or data sources might be equally reputable, fair, or understandable regarding the phenomenon (perceptions) of interest, or they may have an unspoken political agenda, which can lead to misinformation or erroneous perceptions according to the discussed literature. As a result, to overcome these challenges I made sure that I had enough money and created enough time to search the whereabouts of the participants until I reached them. I spent more time with the participants to build mutual trust so that participants would likely provide complete and honest data for the school managers' perceptions of the use of EdTech resources to supervise the curriculum. In addition, I ensured that I should not be judgemental and influenced by biased contextual notions. Consequently, my generated data was trustworthy. The researcher should choose the appropriate case study for this study.

#### **54.4.3 Research design (Case study)**

This study employed a case study as a research style. Moreover, according to Yin (2014), research design is defined as the conceptual blue print within which research is conducted. Further to this, the latter study claims that research design enables the researcher to make conclusions about the spontaneous relationships between the variables under study by providing a coherent model of evidence. In a similar vein, research design includes attitude perception (that serves as a bridge), skill perception (arrangements and plans to generate data), and knowledge perception (forming a research piece). In addition, Creswell and Poth (2016) assert that a qualitative research design can be used to identify and appreciate the meaning that individuals or groups assign to a social or community dilemma. In addition, Döringer (2021) supports Blanche et al. (2006) that research design are plans that guides the arrangement of conditions for generation and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. Thus, the plan outlines the components of a piece of research, including the variables, participants, relationships among them, and the methods used (sampling, measures). Moreover, Köhler et al. (2022) declare that a research design is a strategy or blueprint for how you propose to carry out the research. Further to this, Yin (2014) defines research design as a strategy that directs the researcher in the process of generating, analysing, and interpreting results. As a result, research design enables the researcher to make inferences about the spontaneous relationships between the variables under study by providing a coherent model of evidence (Dutilh et al., 2019; Lorenz-Spreen et al., 2023)

Furthermore, Cohen et al. (2017) agree with Sparkes and Smith (2013) that finding and comprehending the meaning that individuals or groups attribute to a shared or social challenge is possible through the use of a qualitative research design. This is relevant to the unprecedented COVID-19, a social problem that has impacted negatively in the society/education context. Thus, to find a vaccination/solution for this social/education problem, a research study must be carried out. Likewise, developing inquiries and processes are part of the research process (knowledge perception), information that came up spontaneously at the participants' site (skill participants). The facts on frequent topics are provided by research, and the researcher then explains the information (attitude perceptions). In addition, Yin (1984) concurs with Yin (2015) about explaining the strategy of research as dealing with four questions: 1. What questions must be studied? 2. What data are significant? 3. What data must be generated? 4. How must results be analysed? This calls for a comprehensive report that has a flexible framework. Furthermore, Creswell and Poth (2016) emphasise that persons who participate in

this type of study support a research approach that values an inductive manner, an emphasis on personal meaning, and the significance of accurately expressing the complexity of the situation.

Furthermore, Cohen et al. (2017) claim that the research design has a rich description. As a result, the final product of qualitative research is fully descriptive. Similarly, instead of using numbers to describe the phenomenon, the researcher instead uses words and images. In addition, data is presented as document excerpts, field notes, and participant interviews. Further to this, the results of the study are always supported by quotes from videotapes, internet communication, or a mix of these. Similarly, the qualitative design is smooth and emergent, adapting to shifting study settings. In addition, to demonstrate and interpret the data in this study, tables and figures are employed. For gathering data, the study makes use of semi-structured one-on-one interviews, focus groups, and reflective activities.

Furthermore, Mertens and Wilson (2018) agree with Creswell and Poth (2016) that research design is a strategy or plan that shifts the focus from the core theoretical assumptions to selecting the participants, the information-gathering techniques to be employed, and the data exploration to be carried out. Further to this, shared studies like ethnography, case studies, phenomenology, grounded theory/critical, and non-interactive design (concept analysis and historical analysis) are all examples of study designs used in qualitative modes of inquiry (Lee, 2018; Uğur, 2019). Bell et al. (2022) opine that the design issues in the case study resemble several research designs and inquiry methodologies. Furthermore, Mertler (2019) concurs with McNiff (2016) that similar to action research, the focus of case study design is on gathering data to support a particular practise or piece of material rather than generalising findings across the board. However, Ivankova and Wingo (2018) declare that case study addresses specific practical issues, whereas action research focuses on solving problems or informing individual and community-based knowledge in a way that impacts curriculum supervision using EdTech resources and other related processes. Furthermore, Yin (2014) declares that the methodological procedure for gathering data typically includes multi-data gathering techniques and is gathered from multiple sources such as focus groups, reflective activity, and one-on-one semi-structured interviews. Further to this, a case study is a research project that aims to delve deeply into a current situation. As a result, in this study, I gathered data from sixteen participants who were supervising curriculum in schools. Since their context differed, this gave rich information and aided me as a researcher in conducting a thorough examination of the issue. Furthermore, a case study was employed as a method for this study because it is

concerned with how and why school managers perceive EdTech resources in the ways they do (Nhlongo, 2020). The distinction between what the Department of Education intended when it introduced EdTech resources as a mandatory curriculum supervision platform and what school managers actually do with EdTech resources is a subject of concern (Mangal & Mangal, 2019).

Moreover, as with any research methodology, there are always benefits and drawbacks to employing methods to conduct a research study. Jena (2020) asserts that there are benefits to using a case study, but there are also some threats that researchers should be aware of. Further to this, one of the advantages of using a case study is that case studies do not generalise their findings. Furthermore, Maxwell (2021) concurs with Mariotto et al. (2014) that transferability is achievable in case studies only if a researcher can create a detailed description of the case in order to transfer conclusions from one case to another based on similarity. Other institutions may have a similar problem with their school managers, but because people's perceptions are context-reliant, we cannot generalise from the findings. As a result, a study of this type is required to be undertaken at these specific institutions to understand school managers' perceptions and develop contextual solutions that may suit school managers within their current context. Further to this, Harrison et al. (2017) explain that a case study seeks to situate a case in its historical, social, and cultural context. For instance, Although the topic may be the same the case in Ugu district may differ from the case in Zululand district or any other province. Many studies have been undertaken to explore school managers' perceptions of the use of EdTech resources to supervise curriculum, but because they have been conducted in different contexts, a new study in this district is required.

Another advantage or feature of a case study is that it focuses on a single situation, allowing a researcher to gather a huge amount of data (Yin, 2011, 2014). The latter studies further assert that a case study is advantageous because of the richness of information that results from the intensive focus on one situation. Similarly, Harrison et al. (2017) argue that the case study is intensive since the researcher focuses on one instance of the phenomena to analyse it in depth. Moreover, this study used a case study because it did not generalise its findings and instead relied on first-hand knowledge from the individuals. In conclusion, Zuma (2020) and Yin (2015) declare that there are three types of case study, namely, explanatory, descriptive, and instrumental. Additionally, the following part skimpily goes over each form of case study in turn.

### **5.5.1 Explanatory case study**

An explanatory case study explores the varying degrees of relationships between existing variables (Hyldelund et al., 2022; Seet et al., 2023). Further to this, Piekkari and Welch (2018) concur with Welch et al. (2020) that an explanatory case study indicates positivism, being based on testing the theories, and indicating knowledge perception. Moreover, Kotusev (2018) states that an explanatory case study is typically used to answer how and why questions about a particular phenomenon. The latter study further emphasises that as the name implies, the focus is on explanation rather than mere description, such as how and why a programme's expected outcomes were or were not attained.

### **5.5.2 Descriptive case study**

A descriptive case study describes the characteristics of the phenomenon, and relations between variables, or relationships between phenomena, as accurately as possible (George, 2019; Ridder, 2017). In addition, Hancock et al. (2021) support Kyffin and Gardien (2009) descriptive case study as a design that retains a role in the sharing of innovations and initial ideas. Furthermore, a descriptive case study is a study that looks at the background of a person or groups of people and uses a descriptive narrative about how they deal with problems (Cattrysse, 2014; Mohajan, 2018). Nevertheless, Yin (2011) shares the same idea with Yin (2012) as well as Yin (2014) by claiming that a descriptive case study should be referred to as a description with a call to action.

### **5.5.3 Instrumental case study**

Ehrenpreis and DeLooper (2022) declare that an instrumental case study aims to provide insight into an issue or refine a theory in which the case itself is secondary and might be atypical of other cases. Further to this, an instrumental case study uses a case to gain insights into the phenomenon (Owens et al., 2021). In addition, Yilmaz (2013) agrees with Ridder (2017) that an instrumental case study takes a supportive role in deepening our understanding to select a case and identify attributes of interest first.

Moreover, see the instrumental case study conducted by Wakeman (2021) at the University of Northern Colorado, this instrumental case study explored 12 public school teachers' perceptions of mandatory professional development (PD) during times of educational reform

efforts in the state of Colorado. The participants in this study represented five unique school districts in suburban and semi-rural settings who had experienced 14 hours or more of mandated PD on a single topic in the past 24 months and had at least five years of classroom experience. Two research questions guided this case study: What are teachers' perceptions of professional development that is mandated as part of a district-wide instructional improvement initiative? What do teachers say they need in mandated professional development to increase the likelihood of improving their instruction? The data collection method included 45-60 minutes of individual, in-depth interviews with some questions that were informed by PD elements, adult learning theory, and self-determination theory. A hybrid approach to thematic data analysis was used to identify final themes which were aligned to direct quotes that created teacher participants' views. The findings of the study reveal that many of the teachers in this study had unfavourable perceptions of professional development that is mandatory. Respondents shared barriers they faced in realising and implementing the required PD and described the essential features, forethoughts, and planning they want to be embedded in their schools and districts. This suggests that by employing the instrumental case study, I would explore and understand how school managers efficiently use EdTech resources to supervise curriculum.

Based on this study, transferability is possible since an instrumental case study produces a thick description of the case (Conerly, 2020). Further to this, Demuth (2018) asserts that the researcher's use of an instrumental case study allows for the transfer of results based on suitability from one case to another. In addition, Battaglino (2022) claims that detailed information is provided through instrumental case studies, increasing its adaptability and breadth. Likewise, when compared to other research methodologies, the data gathered from this study (which explores how school managers perceive the use of EdTech resources to supervise curriculum) is significantly richer. Thus, this study employed the instrumental case study because it concentrates on one situation (the use of EdTech resources to supervise curriculum). This provides a researcher with the potential to produce a lot of data. Thus, to focus on one instance of the phenomena (usage of EdTech resources), explore the phenomenon thoroughly, and produce a significant amount of data, an intrinsic case study was used. In addition, Gaya and Smith (2016) claim that an instrumental case study offers fresh insight into previously accepted ideas (the use of EdTech resources). Additionally, it demonstrates the misconceptions surrounding the concept as well as the difficulties the researchers confront, and it is more truthful regarding the concept. Further to this, to fully comprehend why school

managers are hesitant to employ EdTech resources to supervise curriculum, the usage of EdTech resources was explored as a novel idea.

However, Bulmer (2017) declares that there is no comparative dimension inside such a study because a researcher cannot generalise the conclusions of a single case research study to other cases. Further to this, Yazan (2015) concurs with Hodge and Sharp (2016) as well as Sebova (2020) that an instrumental case study can influence the data, every person has their own unconscious bias. According to the latter studies, instrumental case studies take longer to analyse data, can be an efficient procedure, require a small sample size to be effective, and are a time-consuming form of gather data. In this regard, Thomas (2021) and Ellet (2007) provide one piece of advice for dealing with the challenges of recognising borders, which is to decide on the study's foreground and background. Thus, I tried to be sensitive to boundaries. I also addressed this issue by using a variety of appropriate data-gathering methods. Consequently, I also attempted to concentrate on data management and used an approach to differentiate between relevant and irrelevant data.

#### **5.5.4 Strengths of a research design (case study)**

In addition, Creswell and Miller (2000) claim that the research design has a rich description. As a result, the outcome of qualitative exploration is therefore richly descriptive. Likewise, Merriam and Grenier (2019) support Mlaba (2020) that words and pictures, rather than numbers, are used to convey what the researcher has learned about the phenomenon. Similarly, Erickson (2012) agrees with Reissner and Whittle (2022) that data is presented in the form of quotes from documents, field notes, and participants' interviews. Further to this, in a qualitative research design issues can be examined in detail (Dorfman et al., 2023). In other words, interviews are not restricted to specific questions and can be guided/redirected by the researcher in real time (Kebede, 2019; Wilson, 2022). This implies that the research framework and the direction can be quickly revised as new information emerges (Safdar et al., 2016). According to Maree (2010) and Ackermann and Eden (2020), research design is a strategy or plan that expands beyond the basic theoretical assumptions to specify the participants to be used, the information-gathering techniques to be employed, and the data exploration to be carried out. Similarly, research design lies in the ability to involve several subjects at a single point in time to achieve data saturation (Braun & Clarke, 2021b; DeJonckheere & Vaughn, 2019). In

addition, Rassel et al. (2020) cite research showing that various variables can be measured and current datasets can be correlated.

### **5.5.5 Limitations of research design (case study)**

Nevertheless, Siponen et al. (2020) emphasise the flaws in the research design because there aren't any insufficiently effective controls. Further to this, the equipment to be used in the research design is outdated or inappropriate (Busetto et al., 2020). As a result, Lakens (2022) declares that if the statistical analysis has not received adequate consideration, is too simplistic, or is unlikely to yield accurate and clear-cut methods. Further to this, this study uses reflective activity, focus group discussion, and semi-structured interviews for data generation. Thus, this research design is qualitative and comprises non-interactive (concept analysis and historical analysis) and shared studies (ethnography, case study, phenomenological, or grounded theory) (Khaldi, 2017). In addition, Hew (2016) concurs with Ruiz (2023) that a case study's weaknesses include that it is based on a single case (the use of EdTech resources to supervise curriculum), which could involve many people as participants. Similarly, Clark et al. (2021) argue that many authors see the case study as an irregular social research design. In the same vein, Rahman (2018) claims that there are some limitations and obstacles which might be encountered in a case study.

Furthermore, Scheffler et al. (2017) declare that one of the downsides of a case study is that it is based on a single case that may involve numerous people as participants. Even though it depended on participants' perceptions to overcome a case study's constraint, I used literature that presented different perceptions on the topic being studied. Further to this, participants provided information based on their perceptions, but the literature expanded on that information by providing more information on similar difficulties encountered globally. Rather than assessing the data in the case study, I let it speak for itself (Befani & D'Errico, 2020). Rather than paraphrasing, I used direct quotations to demonstrate transparency (Massaro et al., 2019). As a result, I was able to do the exploration without interfering with the data generated.

### **5.6 Multi Methods of Generation Data**

This study employed three (3) techniques for data generation/production namely, one-on-one semi-structured interviews, focus group interviews, and reflective activity.

### 5.6.1 Reflective Activity

According to Zuma (2020), a reflective activity is defined as an open-ended question that allows the respondent to use their own words to answer. Further to this, reflective activity is defined as an activity in which an experience is recalled (Oo & Habók, 2020). In addition, Marks et al. (2021) assert that reflective activity is implemented so that the researcher can review the content, and establish the gained knowledge. Paufler and Sloat (2020) claim that, through perceptions, school managers might understand and extend their professional activity (supervise curriculum using EdTech resources). Moreover, Hatton and Smith (1995) assert that there are four types of reflections: scientific, technical, artistic, and moral. Thus, this study focuses on scientific, technical, and moral. These reflections are about finding answers to questions such as What is true? (Scientific reflection); What is effective and efficient? (Technical reflection); and What is good? (Moral reflection). Further to this, these questions relate to different content. Scientific reflection, for example, is concerned with generalising conclusions gained as a result of scientific research efforts (Thomas et al., 2018).

In addition, scientific knowledge is motivated by the frustrations of school managers in their attempts to gain more effective control (Zuma, 2020), indicating knowledge perception. The form of reflection after the task is accomplished to enlighten future behaviours is called reflection-on-action in this sort of perception (Delante, 2017). Further to this, Musonda and Okoro (2022) concur with Andersson et al. (2018) that the efficiency and effectiveness of the means for attaining unproblematised aims is the focus of technical reflection. Likewise, Chinoperekweyi (2020) declares that technical thinking can be about what school managers do in practice (technical rationality), thus, this indicates skill perception. This perception takes place in the context itself and works as a self-correction tool, tending to focus interactively on the action, its outcome, and the intuitive knowledge implicit therein (Pawlak, 2013; Zuma, 2020). Furthermore, artistic reflection is about the personal significance of the school manager in the real situation of their practice, for instance, in everyday school interaction (Yuan & Yang, 2023; Zeichner & Liston, 2013). Moral reflection, on the other hand, is concerned with fundamental principles that apply to everyone in every situation (Banks, 2020), indicating attitude perceptions. Thus, this reflection is about extending awareness beyond the school to moral and social issues (Kolk, 2016; May & Perry, 2022). According to the above version, Helmold and Samara (2019) postulate that a reflective activity can be beneficial for services in

which school managers could gain from orienting themselves to long-term and deeper goals. Further to this, the goal of the reflection is to learn from experiences/perceptions (Weiler et al., 2014). Per Andresen et al. (2020) through reflective, an individual can learn from experience/perception. Further to this, Cantoia (2023) argues that the knowledge gained from the reflective activity can be turned into a learning experience. In addition, Ekelin et al. (2021) declare that a reflective procedure is expected to increase reflective writing and supervisory experience. It is advised that a reflective activity involving field experience be explored as part of developing perceptions, beliefs, knowledge, skills, and attitudes in education and supervision (Baird & Mollen, 2023).

In this study, a reflective activity was conducted once. It was handed to sixteen participants for fourteen days before the semi-structured interviews. The participants were requested to answer the questions framed around TPACK, using the reflective tool. The questions were hand-delivered and the participants were also requested to submit their responses by hand on the date of the semi-structured interview. Furthermore, questions as constructed were guided by the concepts of the TPACK framework. In addition, the benefit of open-ended questions is that the participants could respond as much as they wished. Moreover, open-ended questions were suitable for exploring complex issues in which simple responses could not be provided (Cohen et al., 2011). Further to this, Fiel'ardh et al. (2023) claim that reflective activity allows participants to identify and appreciate positive experiences/perceptions and better identify ways that can improve their practices and service delivery. In addition, the latter studies further declare that reflective activity can also be useful when a participant has had more challenging experiences/perceptions and can assist the participants in processing and learning from them. Nevertheless, Hesse-Biber (2014) states the weaknesses of the reflective activity with open-ended questions include that the respondent may overlook instructions, and be preoccupied with demands to write. Furthermore, completing a questionnaire takes more time than placing a tick in a rating-scale box (Zuma, 2019). Thomas (2020) agrees with Yu et al. (2022) that reflective activity has no time, whether a participant is studying, working or both it can be hard to find time to complete the existing to-do list so why add another thing? As a result, to overcome this challenge, I gave participants fourteen days to complete their questionnaires. I also reminded them via e-mail and telephonically to avoid time wastage.

### **5.6.2. Interviews**

An interview is a qualitative research method that relies on asking questions to generate data (Oun & Bach, 2014; Renjith et al., 2021). The latter study further asserts that a research interview involves an interviewer, who coordinates the process of the conversation and asks questions, and an interviewee, who responds to those questions. Moreover, interviews can be conducted face-to-face, over the telephone, or online (Mirick & Wladkowski, 2019). There are different types of interviews, namely, structured, semi-structured, and unstructured (Adhabi & Anozie, 2017). In reaching this decision, researchers could assess the benefits and drawbacks of interviews as a methodology for study (Rahman, 2020). In addition, Eppich et al. (2019) argue that structured interviews are based on a fixed set of pre-determined questions, and this does not interviewees to shape the discussion. Furthermore, Adams (2015) agrees with Turner III and Hagstrom-Schmidt (2022) that structured interview methods provide the exact wording of questions that follow a precise sequence with specific rules for coding responses. An unstructured interview, on the other hand, is effective when the researcher is uninformed of what they do not know and must rely on the respondents to inform them as indicated (Abhulimhen-Iyoha, 2020). Furthermore, because questions are not regularly pre-planned in unstructured interviews, the interviewer leads the conversation and follows what the interviewee says (Monday, 2019). In addition, semi-structured interviews are suitable for gathering qualitative data, because they offer opportunity for discussion that arise during data gathering (Husband, 2020). The study chose the face-to-face semi-structured interview method after examining three types of interviews.

#### **5.6.2.2 One-on-one semi-structured interview**

According to Bruhjell (2016), one-on-one semi-structured interviews are viewed as the appropriate data generation method for this study because it could give freedom to participants and allow them to ask for freedom to seek clarity when the need arises. Further to this, semi-structured interviews empower the participants, allow free interaction between interviewer and interviewee, allow opportunities for clarification so that relevant data is captured, and offer the researcher access to people's ideas, thoughts, and memories in their own words, rather than in the words of the researcher and maximise descriptions and discovery. However, Hofisi et al. (2014) argue that one-on-one interviews offer the possibility of modifying responses and investigating underlying responses. According to Kakilla (2021), one of the weaknesses of the semi-structured interview is data loss due to the language barriers. Thus, I could be friendly

and approachable and create a welcoming and relaxing climate during the interview process. Moreover, I encouraged school managers to be open and drive the discussion/interview on their perceptions towards their curriculum supervision using technological resources. Furthermore, the questions were planned to save time. Moreover, I gave copies of questions to participants for reference and the session took thirty (30) to thirty-five (35) minutes per participant after working hours (between 16h00-17h00). I did not experience the challenge of the language barrier since all my participants were English and Zulu speakers.

### **5.6.3 Focus group interview**

Maree (2013) concurs with du Plessis and Van Niekerk (2014) in describing focus groups as a strategy based on the assumptions that group interaction could be productive in widening the range of responses, activating forgotten details of perceptions, and releasing inhibitions that may otherwise discourage participants from disclosing information. Further to this, a focus group is defined as a group of people assembled to participate in a specialised, interactive discussion about any topic of interest to the researcher in a non-threatening environment (Cohen et al., 2017; Edwards & Lane, 2021). Similarly, focus groups have been used in different fields such as market research, psychological research, and academic research (Hall, 2020; Richard et al., 2021; Vaughn et al., 1996). Furthermore, Subban and Round (2015) concur with Moustakas and Kalina (2022) that the usage of focus groups in different fields signifies that they accommodate a variety of purposes and are thus likely to be organised differently to suit the purpose of the research. Moreover, Lobe (2017) indicates that there are two kinds of focus groups: structured (which is mostly used in market research) and less structured (which is more commonly used in social sciences). In addition, the two approaches to the conversations differ. For instance, an organised focus group allows researchers to participate actively in the discussions, sometimes to the detriment of minimal discussion among the members (Liamputtong, 2011; Prior, 2018).

However, Stewart and Shamdasani (2014) agree with Barber (2022) that in a less controlled focus group, members' discussions are welcomed, and the researcher is not at the core of the discussion. In addition, focus groups are used to better understand the interpretations and meanings that participants create during their discourse (Stoor et al., 2019). For this study, one focus group was used to understand the school managers' perception of the use of EdTech resources to supervise curriculum. According to the literature, there appears to be no agreement

on the number of individuals that should comprise a focus group. Whilst some researchers advocate six to eight (Creswell & Hirose, 2019; Liamputtong, 2011) or eight to ten (Micheli et al., 2019), others advocate for small focus groups of three to four or three to six participants (Burke et al., 2018) as the ideal number of participants to constitute a focus group, it facilitates vital interaction among participants involved in meaning establishing and discourse generation (Baierl, 2023; Bland, 2022). Furthermore, the goal of the focus group was to explore deeper into the findings of the one-on-one semi-structured interviews. After completing all of the interview transcriptions, data categorisation, and preliminary themes, I developed the focus group question schedule, as the focus group approach was utilised to supplement the semi-structured interviews. The decision to conduct a focus group following the interview was driven by the realisation that certain participants would interact and communicate themselves better in a group setting as compared to an individual interview setting.

## **5.7 Sampling**

Benestan et al. (2015) define sampling as the process used to select a portion of the population for study. Furthermore, Silverman (2015) categorises non-probability sampling into two groups namely; purposive and convenience sampling. Moreover, the latter study defines purposive sampling as when participants are selected because of defining characteristic that makes them the holders of data needed for the study, whereas convenience sampling is when the population elements are selected based on facts that are easily and conveniently available. Likewise, Silverman (2015) identifies the strength of convenience sampling as that it is quick and inexpensive, but does not result in representative samples. As a result, this study has employed both purposive and convenience sampling because I purposively wanted to explore the school managers' perceptions of the use of technological resources to supervise the curriculum. Thus, school managers were easily accessible to generate the data since they are supervising in the same district where I work. The environment in which the study was conducted is Zululand District. For this study, the sample consisted of sixteen (16) school managers, which were recruited from four (4) different school management centres guided by the proximity on the radius of thirty-five (35) to forty (40) kilometres. Further to this, I recruited participants with four (4) years' experience and the above as school managers namely principals/deputy principals. As a result, the generated data was analysed to find meaning and make informed decisions.

### 5.7.1 Convenience sampling

Convenience sampling is also known as opportunity sampling (Zuma, 2020). Further to this, it is a procedure that selects the nearest persons as participants and repeats the procedure until the appropriate sample size is confirmed. Case studies employ this sampling approach (Cohen et al., 2017; Stratton, 2021). Moreover, Brandão et al. (2019) assert this method of sampling (convenient) entails recruiting people directly in the field based on the opportunity available at the moment. At the time, convenient sampling is reasonable in terms of cost and the participants are easily accessible (Krupnikov et al., 2021). Furthermore, Simkus (2022) argues that convenience sampling is effective and easy to implement. Sexton (2022) states that utilising convenience sampling, the first available data is used for the research, with no additional prerequisites. Moreover, Bhardwaj (2019) argues in convenience sampling, there is no need for a comprehensive list of all population elements. Convenience sampling is based on the notion that it is the simplest method of gathering participants with knowledge of the phenomenon, who might feel free to share, and express their experiences/perceptions concerning the research conducted (Campbell et al., 2020). The selection of school managers to engage in this study was made to avoid ethical concerns about pushing participants to participate in a study (Zuma, 2020). As in the case of this study, the proposed participants numbered sixteen. Finally, I assembled sixteen curriculum supervisory school managers and requested them all to participate in the study. Further to this, Etikan et al. (2016) argue that it is preferable to use known persons in convenience sampling rather than unknown people. These participants were selected because they were at the right place at the right time (Jager et al., 2017). Fortunately, all participants participated without fail. In other words, the sixteen chosen participants were simply accessible and convenient for both the researcher and the participants. These participants were informed about the phenomenon and offered their perceptions based on this approach. In addition, the participants were chosen to provide an environment in which they could freely discuss their perceptions to collect rich and useful data.

Nevertheless, the main disadvantages of convenience sampling include inconsistency and bias, which cannot be measured or controlled (Cheung et al., 2017). Likewise, Kim et al. (2021) accentuate that the non-probability techniques are based on purpose that leads to assumptions, resulting in risk. Further to this, Schreier (2018) states that assumptions can generate inappropriate generalisation of the population. This sampling is carried out without adequate consideration of the population's conceptual definition and rigorous evaluation of potential

biases (Purdy, 2021). Convenience is incompatible with most non-probability sampling approaches. For the reasons stated above, convenience sampling is critiqued (Baltes & Ralph, 2022).

However, I was able to overcome various study constraints due to convenience sampling. Further to this, Fellows and Liu (2021) assert that the adoption of convenience sampling necessitates extreme caution in terms of sample plan design and execution. In addition, Coppock (2019) stresses that the purpose of convenience sampling is not to generalise beyond the larger population, but to cautiously interpret the result of the study (Zuma, 2020). The knowledge gained should be generalised to the population from which the sample was drawn (Simeone et al., 2020). Thus, the convenience sampling method was chosen to suit the study's objectives, which led to the purposive sampling method.

### **5.7.2 Purposive sampling**

According to Yin (2014), purposive sampling is a deliberate manner of choosing samples. Further to this, Cohen et al. (2017) claim that this type of sampling is used to acquire in-depth information from the participants who are in a position to provide it. In addition, Luciani et al. (2019) affirm that all sampling decisions should be planned and deliberate in order to effectively address the specified research questions. Likewise, Benoit (2018) declares that purposive sampling is utilised to keep costs down to the cost of paper used to print questions, as well as the cost of conducting a case study. Moreover, in purposive sampling, the researcher uses their own judgement to select a group of people who know about the problem (Sharma, 2017), to demonstrate the difference between private and public perception.

In this sense, I purposefully chose school managers who supervise curriculum in order to obtain the greatest information to address the study's objective (Du Plessis, 2017). Further to this, the chosen participants have the necessary knowledge and expertise, are available and eager to participate, and can communicate their experiences and ideas in an articulate, expressive, and reflective manner (Jamalimoghadam et al., 2019). Purposive sampling was used to focus on school managers' perceptions of the usage of EdTech resources to supervise curriculum, which helped with study relevance (Kaewsaiha & Chanchalor, 2021). Similarly, in the sampling strategy selected, I was able to learn significant issues of central importance to the purpose of

the study (Kaewsaiha & Chanchalor, 2021). As evidenced by their experience, relevant participants have the desired knowledge (Zuma, 2020).

Nonetheless, in purposive sampling, the researcher is the sole judge of who is included in the study. The researcher may disregard individuals who are knowledgeable about the phenomenon. Hence, procedures are utilised to find the sample, and the findings are not generalisable (de Leeuw et al., 2015). In addition, Ngozwana (2018) postulates that purposive sampling is used when the researcher has a certain goal in mind, and participants who are appropriate for the study are included. Additionally, the goal was not to generalise, but to develop cases with plenty of data for in-depth study, gaining much about critical concerns (Thomas, 2021). I chose sixteen school managers who were supervising the curriculum and had the option to participate after multiple trips to the schools, and the research sites where the data processes were implemented. No school managers refused the requests due to confidentiality concerns. Consequently, I concentrated on all sixteen participants who volunteered for the study. As a result, I concentrated on those who contributed to the generation of the data.

## **5.8 Data analysis**

Creswell (2013) concurs with Mayer (2015) when defining data analysis as an activity of making sense of interpreting and theorising data that signifies a search for general statements among categories of data. Furthermore, Schabenberger and Gotway (2017) as well as Budden (2016) define data analysis as bringing order, structure, and interpretation to the mass of collected data. In addition, Cohen et al. (2017) declare that data analysis is the search for general statements about relationships among categories of data and it is the search among data to identify content. According to the later studies, qualitative data analysis entails organising, accounting for, and making sense of the data in connection to how participants perceived and described the phenomena (perceptions), as well as noticing patterns, themes, categories, and regularities. Similarly, Nardi (2018) and Thomas et al. (2022) consider data analysis to be the mass of words gathered using data methods that should be summed and summarised in order for the researcher to develop a relationship between numerous themes that have been established. The latter studies go on to say that data gathering enables the generation of theory utilising advanced analytical approaches, which may be recommended for policy or practise. Furthermore, these definitions reveal that data analysis is the process of making sense of data

using certain processes that provide inductive or deductive reasoning regarding participants' assimilation with the phenomenon of the study. Furthermore, the content aspect emerges from these perceptions of data analysis because they identify certain methods that should be implemented to provide qualitative analysis, such as interpreting, describing, summarising, categorising, and organising, among others. This indicates qualitative data analysis is not imbued with linear alignment, but rather involves a different type of logic in understanding and explaining the findings.

Furthermore, Ruslin et al. (2022) share similar views as Guest et al. (2013) that qualitative data analysis attempts to define concepts, map phenomena, frame typologies, maintain linkages within data, provide in-depth explanations, and express tactics. Furthermore, Hammersley and Atkinson (2019) declare that information gathered through data analytics can be utilised against a certain community, region, or country's inhabitants. Furthermore, the latter studies claim that it is difficult to identify the appropriate data analysis resources. This is because it necessitates an understanding of the tools/resources as well as accuracy in interpreting the essential data as per applications. Moreover, the study was aware of the area of focus that formed the study's themes and research questions when examining the data. In this study, I defined concepts in the context of curriculum components while also addressing the phenomenon, research objectives, and study questions. As a result, quantitative approaches are primarily concerned with the depiction of numerical or statistical data. Whereas qualitative analysis seeks to find the importance of events through participants' perceptions, attitudes, and opinions. As a result, the study sought to comprehend and assess participants' perceptions, assumptions, and points of view about the usage of EdTech resources to supervise the curriculum. The study expected that data analysis would reveal themes and patterns that would not only enlighten school administrators but would also add to the body of knowledge. In this sense, I defined the notions inside the framework of TPACK. This included using words, phrases, quotes, and statements to reflect participants' accounts of their experiences/perceptions (Kim & Hong, 2021). A theme, in addition, contains information about the data in relation to research questions and reflects a patterned response or meaning within the produced data (Denscombe, 2017; Morgan & Nica, 2020).

Moreover, Akinyode and Khan (2018) concur with Kiger and Varpio (2020) that the process of qualitative data consists of six stages. The content aspect blends while defining these stages because certain parameters are established to allow for qualitative exploration. In addition, Sun

et al. (2020) accentuate that the initial stage denotes the data's definition and identification. Further to this, Besley et al. (2018) claim that data should be understood in the context of the study questions and objectives. In this regard, I began this stage by first engaging the study questions and objectives centred on perceptions of what, how, and why school managers use EdTech resources to supervise the curriculum. Given this, the study seeks data in this context. Furthermore, the second step includes data generation and storage. Furthermore, the study gathered data from school managers supervising curriculum using EdTech resources and stored it utilising the three techniques. The data for both the focus group and the semi-structured interviews was saved via recordings and transcriptions. Furthermore, after completion by participants, reflective activity replies were returned to me and saved in my file. Further to this, the third stage is data reduction and sampling, which involves separating irrelevant data from useful data. Moreover, Cohen et al. (2017) as well as Moser and Korstjens (2018) stress that qualitative data can be voluminous which implies that the researcher should make a selection of data concurrent with the intended purpose of the study. Thus, I chose data that answered the research questions and presented a response to the phenomenon with care. Such information aided in the categorising of themes and patterns that highlighted resemblance inconsistencies, and trends.

As a result, the fourth step pertains to data organisation and coding. To link to analytical themes that emerge, data is sorted into codes/categories/patterns/trends. The data for this study was classified into themes and categories that arose from a review of the literature on the use of EdTech resources, which are primarily concepts. These concepts had been combined with the theoretical framework to form themes. Further to this, Widyastuti (2019) and Yazan (2015) declare the fifth step as a theory development and testing stage. It promotes the goal of research, which is to generate fresh knowledge. In addition, the behaviours and reactions of participants aid in the testing of theories and hence provide critical insight into phenomena. Furthermore, the study concentrated on the TPACK theory's inception when using the data-generating method to explore participants' perceptions and reactions to the phenomenon and test whether this theory is realistic. According to Kiger and Varpio (2020), the sixth and final stage of data analysis is reporting and writing up the research. In this regard, this is based on my understanding of the research in producing the report on the development of arguments based on the findings of the research. As a result, the findings should articulate newness of knowledge while also elevating present knowledge in a particular field. In leading this study, I sought to provide credible data assumptions with the primary goal of understanding the implications for

the existing body of knowledge, as well as to raise awareness about the factors that produced participants' perceptions of using EdTech resources to supervise curriculum.

Furthermore, Aspers and Corte (2019) concur with Gale et al. (2013) that a typical qualitative analysis involves various components. Further to this, according to the latter studies, the first part is coding or classifying field notes, interviews, or other data methods in which words are evaluated in terms of what is significant or regularly repeated, and these are chosen to build a pattern or trend. As a result, in this study, I triangulated interview transcripts with participants' reflective activity to find trends and themes from what they expressed verbally or demonstrated through words. Moreover, the following aspect is the relationship that can be deduced from the responses of participants. Further to this, Antwi and Hamza (2015) have supported Hill and Torres (2023) when claiming that to gain credibility, the researcher relies on existing knowledge to understand these relationships. Thus, I recounted participants' previous knowledge of the phenomenon which they engaged through their use of traditional resources (pen and paper) and used it to understand current experiences/perceptions of how they conducted their curriculum supervision using EdTech resources. In addition, the third aspect stressed by Hill and Torres (2023) as well as Lochmiller (2021) is the ability of the researcher to make explicit the patterns and themes that arose through theoretical construct. Thus, I merged the TPACK theory with the curriculum components to create the curriculum TPACK theory to explain how participants embraced the phenomenon of EdTech resources. Moreover, the fourth aspect is generalising the analysis relationship (Hunter & Miller, 2022). As a result, the findings of this study can be generalised to similar situations using the same research methodologies used here. Furthermore, the last part of this idea is formalising theoretical constructs and drawing conclusions from them to other cases. Finally, the theoretical constructs developed in this study was used to make comparisons and contrasts with studies from the literature.

Moreover, Akinyode and Khan (2018) acknowledge the various techniques in administering the analysis of qualitative data. Furthermore, this belief arises from the idea that different questions must be addressed for distinct descriptions of social reality. Among these are content analysis, grounded theory, grounded analysis, guided analysis, and discourse analysis. These various approaches are linked and are frequently interrelated, overlapping, or mutually exclusive. They do, however, each expresses a unique perception or view on reality analysis.

Given the phenomenon, research objectives, and theories used, this study employed guided analysis as an approach to analyse data gathered from participants.

### **5.8.1 Guided analysis**

Guided analysis, often known as thematic analysis, is a technique for analysing classifications and presenting themes from data (Kiger & Varpio, 2020). Furthermore, Williams and Moser (2019) agree with Pentina et al. (2018) that guided analysis is excellent for explorations that seek to uncover through the use of interpretations as a platform. However, Bulmer (2017) and Lacey and Luff (2001) define guided analysis as involving categories *a priori* (thus (categories determined in advance of data generation and analysis proceeds in relation to the prescribed categories) and grounded approach (where categories emerge from the data). This suggests that the interpretivist researcher is interested in exploring and presenting data that is rich in information from participants. This data stimulates participants' attitudes, sentiments, emotions, experiences, ideas, perceptions, and beliefs, which they transmit to the researcher first-hand. This suggests that the data is unprocessed and must be analysed. Units of analysis can emerge from both theory and data through guided analysis. In addition, as it is a specific data analysis approach that can be employed for qualitative exploration positioned inside an interpretive paradigm, the content component is projected through these guided analysis assumptions. Furthermore, it emphasises how this form of analysis should be applied to the data. Additionally, Sedov (2018) supports Maxwell (2008) that guided analysis is useful in connecting theories from the literature to crucial concerns that arise from data obtained using various approaches. Likewise, concepts can then be grouped, related, and categorised (Bulmer, 2017; Moser & Korstjens, 2018). Further to this, themes arising from the data and theory could then be discovered and linked to the literature. Similarly, Tyanova et al. (2016) agree with Alzubaidi et al. (2021) that this type of analysis enables researchers to acquire both precision and complexity while also empowering their holistic interpretation of data. In this regard, the researcher can explore the correlations between concepts and compare them to duplicated facts, such as those from the literature review. As a result, participants' perceptions and explanations are compared with those from related studies. Thus, this study adopted a qualitative method. This necessitated exploring data in the form of interpreting words rather than numbers (Merriam & Grenier, 2019; Mohajan, 2018). Thus, the guided analysis is a negotiation of grounded theory and *a priori* analysis (Hörold et al., 2022; Silverio et al., 2019). In addition,

Urquhart (2022) agrees with Gibson and Hartman (2013) that grounded theory fits in a qualitative study that attempts to determine a theory relating to a particular environment. In addition, as stated by Cho and Lee (2014) and Engler (2021), grounded theory is viewed as a method of developing theory through research data, rather than evaluating concepts prepared before data gathering and analysis. Moreover, Zamani and Babaei (2021) explain that grounded theory is a methodology that was designed to generate ideas from data. As a result, the process of generating ideas using data necessitates an inventive approach to data selection. Furthermore, it entails a theoretical sampling of subsequent ideas as they emerge from the data. Thus, sites and sources are flexibly chosen based on their theoretical importance in generating comparisons and extending or enhancing ideas, rather than their representational value in allowing generalisation to specific populations. For Glaser and Strauss (2017) there are no great theories in grounded theory that can be assumed to make predictions in advance of analysis.

Grounded theory is derived inductively from the study of the phenomenon it describes. According to Sellnow and Seeger (2021) and Broad (2022) grounded theory is found, developed, and tentatively validated through systematic data generation and data analysis relevant to that phenomenon (perceptions). As a result, gathering data, analysing it, and theory are all inextricably linked. Furthermore, Kazdin (2021) concurs with Ormston et al. (2014) that researchers do not test hypotheses in order to add to an existing body of knowledge; rather, they do not know what they do not know. Further to this, grounded theory allows us to study a relatively unknown social phenomenon around which a specified theory may not exist. In addition, Bulmer (2017) and Glaser and Strauss (2017) define a theory as grounded in data rather than priori formed ideas, notions, or systems. As a result, if no theory emerges, the research is going to be theoretical but retain its descriptive importance.

As a result, the a priori established categories are negotiated and improved considering accommodating unknown but still relevant categories uncovered through data interaction (Conus & Fahrni, 2019; Firth, 2014). As a consequence, some categories are determined deductively, that is, before data interaction, and inductively, that is, by observation of actual data. Moreover, this sort of analysis was appropriate for the study. Furthermore, data creation methods were applied, allowing categories to develop that I had not anticipated. As an illustration, open-ended questions were employed in the study via interviews. This allowed for spontaneity, in-depth questioning, and clarifying responses to complicated issues concerning participants' perceptions/experiences (Ahmed, 2017; Löhr et al., 2020). According to Dey

(2003) and Makumane and Ngcobo (2020) guided analysis entails creating categories before data creation and then modifying the established categories based on data interaction throughout the analysis stage.

Furthermore, the priori themes were drawn from the phenomena on which this study was based (school managers' perceptions) as guided by the research questions. The themes were thus deduced from the three prepositions of school managers perceptions: attitude perception (why do school managers perceive the use of technological resources in supervising curriculum in the manner that they do?), skill perception (How do school managers perceive the use of technological resources when supervising the curriculum?), and knowledge perception (Why do school managers perceive the use of technological resources in supervising curriculum in the manner that they do?). As a result, these themes aided in gathering data on school managers' perceptions of the use of EdTech resources to supervise curriculum. Furthermore, nine concepts were used to form categories, and each concept represented one of the three prepositions as prompted by research questions. To attain a meaningful conclusion, as theorised by (Ungerer, 2021).

The procedures I followed in presenting the data analysis are accounted for in the preceding discussion, which illustrates the many phases of guided analysis. Further to this, guided analysis aided the study in discovering categories in the form of patterns and trends, as well as being able to classify these categories into TPACK theory-derived themes. Furthermore, applying this type of procedure shows the data in a relevant way, relating to the research questions and phenomena of EdTech resources. Likewise, guided analysis can be used to interpret and perceive participants' experiences by accounting for how they use EdTech resources to supervise curriculum through iterations of perceptions, narratives, beliefs, and assumptions. I was cognisant of the interpretive case study utilised and the qualitative method regulating the entire study when I began such a procedure. Consequently, I have ensured that the study is acceptable and trustworthy to the community.

## **5.9 Trustworthiness and Rigour**

According to Msweli (2020) and Forero et al. (2018), qualitative researchers create trustworthiness of their findings by ensuring that findings are credible, transferable, dependable and confirmable.

### **5.9.1 Credibility**

Both Brenner (2009) and Mayan (2016) describe credibility as the accurate presentation of a particular context or event as described by the researcher. Moreover, Brenner (2009) further describes credibility as an assurance that researchers' conclusions stem from the data. I used multiple methods such as reflective activity, one-on-one semi-structured interviews, focus groups, and recordings, to engender valid, credible, and varied constructions of realities (Godínez Martínez, 2018). To achieve credibility in this study, the same questions for reflective, one-on-one semi-structured and focus groups were used. Results were generated and taken as participants' perceptions in the research. One of the flaws in establishing credibility, however, is the researcher's personal views and individual prejudices may influence the study (Cypress, 2017; Savin-Baden & Major, 2023). Thus, I was aware of this factor and took precautions to avoid bias in the research.

### **5.9.2 Transferability**

Moreover, transferability is defined by Brenner (2009) and Hammersley and Atkinson (2019) as the degree to which generalisation can be made from the data and context of the research study to the wider population and settings. Further to this, it is regarded as how the reader can take the findings and transfer them to the other context. In addition, Cypress (2017) concurs with Rose and Johnson (2020) that credibility concerns itself with the accuracy of the data in the context of social phenomena under exploration. It also suggests that the research findings have truth, and whether a correlation can be detected between the participants' direct responses and data interpretation. In addition, Hall (2020) advocates Disterheft et al. (2015) for rigour in research by incorporating the following credibility tactics into a study: sustained involvement, sampling, member checking, and peer debriefing/examination. Moreover, Marinho-Araujo et al. (2022) support Jinks et al. (2013) that sustained involvement refers to the amount of time researchers spends in the field/school immersing themselves in the participants' social life. As a result, I made certain that I spent enough time at the fields/schools not only to gather enough data but also to interact with their surroundings to eliminate any potential prejudices or

assumptions that could have hampered the data gathering. Similarly, Amin et al. (2020) concur with Wahyuni (2012) and Anney (2014) that peer debriefing happens when a researcher seeks advice or assistance from other professionals to improve the quality of their findings. In connection with this, I solicited advice from other researchers who had previously undertaken research of a similar kind to that of this study. This enabled me to clarify the findings using appropriate research methods. Furthermore, the issue of member checks necessitates ongoing testing and data checks (Iivari, 2018; McKim, 2023). Further to this, Varpio et al. (2017) argue that member checks are critical to legitimacy, thus, researchers must employ the voices of participants in data processing and interpretation, to generate data corroboration and coherence. In this regard, I ensured that these due processes comprised the execution, analysis, and interpretation of the data, which contained direct quotations and words from participants to strengthen the findings' credibility.

### **5.9.3 Confirmability**

Kyngäs et al. (2020) advocate Creswell (2014) when describing confirmability as the extent to which the research findings reflect the perceptions and ideas of the participants. In addition to that, Mundy et al. (2004) argue that for the data to suit confirmability there must be evidence after the data has been generated, categorised, reconstructed, and interpreted. In light of this, participants validated and approved the data acquired from focus groups, reflective activities, as well as on one-on-one semi-structured interviews (Otte et al., 2019). The study ensured that validity and credibility, as well as multiple and diverse realities and data-gathering methods, were in order. In addition, false information would influence the accuracy of this study's findings. As a result, I clearly defined the goal of the research, which was supported by using data acquired from reflective activities, one-on-one semi-structured interviews, and focus groups to assure accuracy.

### **5.9.4 Dependability**

Trustworthiness to promote dependability includes unanimity and conformity in data analysis, which is frequently at the expense of the findings' meaningfulness (Connaway & Powell, 2010; Robinson, 2019). Further to this, Smith and McGannon (2018) aver that dependability also agrees with the idea of trustworthiness which promotes repeatability. Thus, I achieved dependability by presenting a full explanation of the research process during data gathering. I

also gave the main method of gathering empirical data, such as the content of questions utilised during data collection. Furthermore, evidence acquired from the reflective activity, face-to-face semi-structured interviews, focus groups, tape recordings, and direct quotations contributed to a more legitimate, trustworthy, and diversified construction of realities (Hancock et al., 2001; Mann, 2016).

In qualitative research, the study must precisely explain the phenomenon being studied (Aspers & Corte, 2019; Cohen et al., 2017). I carefully and frequently listened to the recordings, transcribed the information as it was, and accurately described school managers' perceptions of the use of EdTech to supervise curriculum. In addition, after each transcription, I returned to the participants for cross-checking and validating before drafting the study's conclusions and findings. This was done to verify that all participants had the same interpretation of concepts, ensuring dependability. In that regard, I avoided bias by providing empirical data through participant quotations.

Since I am also a school manager, I was not judgemental and ensured that I did not have any personal interest during the interview sessions. Hence, I could not express my opinion or perceptions during the research project. Thus, I allowed the participants to respond the way they wished without any interference. Further to this, some participants could not be reachable due to some commitments, poor network connections as well and the reluctance of the participants to partake fully hindered the progress of the study. Thus, I kept on pleading and persuading them to participate in my study, and because of that, they ended up cooperating successfully. Moreover, one of the limitations of qualitative research is that it is hard to generalise from a small number of case studies. To overcome this challenge, I increased the sample population to sixteen (16).

### **5.10 Ethics**

Ethics is a branch of philosophy that deals with the conduct of people and guides the norms or standards of behaviour of people and their relationships with each other (Akaranga & Makau, 2016). The latter studies further allude that it refers to an “ethos” or a way of life; social norms for conduct that distinguishes between acceptable and unacceptable behaviour. This suggests that educational researchers must consider the effects of the research on the participants. In addition, Williams (2023) advocates Cohen et al. (2017) that researchers must adopt ethical

principles, which include policies regarding consent forms, confidentiality, anonymity, privacy, and caring. Additionally, the latter studies add that issues of ethics may arise because of the types of topics explored by social scientists and the processes they use to get authentic and reliable data. Similarly, Romm and Romm (2018) underscore that the examiner is responsible for taking into account the effects of the research participants. However, WHO (2022) and Schneider et al. (2019) pinpointed the four key principles that endorse ethical values. These include non-maleficence, beneficence, autonomy, and justice. Non-maleficence suggests that research should not cause any harm, intentional injury, or emotional offence (Kung & Johansson, 2022; Tomson, 2018). Thus, when conducting interviews, I made certain that participants were in a safe atmosphere throughout the research process. Likewise, Cohen et al. (2017) declare that starting an interview entails interpersonal engagement between the researcher and the participants. In other words, I should be mindful of making the participants feel protected and safe. As a result, I made certain that the school's security was always present outside the school grounds to prevent any potential threat or risk. Throughout the process, I also checked on and maintained the comfort of the participants. Moreover, beneficence suggests that a researcher must also protect participants from exploitation (Alkhunaizi & Alhamidi, 2023; Barrow et al., 2017). The latter studies further claimed that any information provided by participants through their study involvement must be protected. In addition, Jevremović et al. (2022) support Martela and Ryan (2016) that beneficence is significant in research. As a result, I made certain that sanitisers were available for participants and that the environment was conducive to interviews; that I avoided acts that could endanger the participants; and that I respected the participants' preferences for the language in which they chose to respond and the care they received. I was aware of other curricular courses offered by UKZN and other universities, and I believe that this current study could have a favourable impact on their pedagogical efforts. Furthermore, this research could be beneficial to other specialisations and contexts that are similar in nature (Lincoln & Guba, 1985b; Ruggiero et al., 2021). Furthermore, justice was kept by requesting that the researcher view the study in its completed form for everyone who participated. As a result, participants from all origins, ages, cultures, genders, and religions were included in the study to reflect the spirit of democracy in South Africa. In addition, Budden (2016) together with Resnik (2018) extend the meaning of justice in research to incorporate the avoidance of exploitation and the abuse of participants. As a result, I valued the study participants' contributions and vulnerabilities by treating them with dignity and reacting to their iterations with humility and thanks. In addition, participants were informed of the use of pseudonyms to protect their anonymity. Furthermore, once it was

determined that the participants understood the entire process of the study, consent forms were distributed to those who decided to participate. In addition, participants were also given time to read the consent forms. Following that, participants signed consent forms to allow the research to proceed. Furthermore, I constantly checked to see if the participants were still willing to continue. The participants accentuated their willingness to participate in the study. Regarding that instance, the already indicated ethical principles may mitigate, if not eliminate, the ethical issues.

Moreover, Autonomy explains that every participant's thoughts, perceptions, and rights must be upheld and respected (Daly, 2017; Wildavsky & Dake, 2018). This suggests that to respect the participants' dignity as human beings, I must act appropriately. As a result, the participants' identities and responses were kept private. Furthermore, the participants' actual names were not used; instead, letters such as P1, P2, and P3 were used to represent the individuals' names. Participants were permitted to leave the study at any moment without incurring any negative consequences. Participants were not compelled to give information they did not choose to reveal. In addition, a letter was written to the District Director requesting permission to access school managers in school. Surprisingly, no response was received from the District Director. I used an online platform to apply for a clearance certificate/letter from the UKZN Ethics Committee and a gatekeeper's letter at the KwaZulu-Natal Department of Education, to conduct my study. I also requested permission from the Head of the Department of Education to conduct the study at the designated schools in a letter. Fortunately, I was granted the gatekeeper's letter. After the research was approved, I contacted the participants by phone, in person, and writing, requesting that they participate in the study. Thus, in this study, I followed ethical guidelines to avoid potential ethical concerns. Further to this, permission was requested verbally, followed by writing a letter to the participants. Since the study's goal was to explore school managers' perceptions of the use of EdTech resources to supervise curriculum, the most convenient venue for the research was the schools.

In reaching an agreement with the participants, I informed them verbally and in writing about the entire research process, ensuring their protection against any issues that may emerge throughout the research. Furthermore, I outlined verbally and in writing the goal of the research study, as well as how the data gathered would be used solely for the study. Moreover, I informed all study participants of their rights to confidentiality, anonymity, and the right to withdraw from and rejoin the study at any time (Cohen et al., 2017; Ngozwana, 2018).

Additionally, I notified the participants that there would be no financial reward for their participation. Instead, I indicated to prospective participants that the case study would assist them in developing understanding and improving their use of EdTech resources.

### **5.11 Limitations**

Moreover, Braun and Clarke (2021b) advocate Shipman (2014) that there is no research without limitations. Therefore, it is crucial to acknowledge the flaws and publicly state them. Further to this, Andrew et al. (2019) concur with Fellows and Liu (2021) to define limitations as aspects of the research design and technique that may have influenced the interpretation of the findings. Issues of generalisability, applicability to practices, and measures of reaching trustworthiness are examples of such limitations. Thus, in this study, the case study style of research was employed within the confines of the purposive and convenience sampling methods. This meant that only sixteen participants were chosen, and the findings do not represent the entire group of school managers in the province of KZN. As a result, generalisations were restricted to analytical assumptions. I could have been biased because I was aware of who these individuals were because purposive sampling entails hand-picking participants. To address this worry, ethical standards were adopted, which included maintaining participants' confidentiality and anonymity throughout the research procedure. Rahman (2020) and Roller and Lavrakas (2015) further claim that one of the other disadvantages of qualitative studies is their inability to establish validity and reliability. Thus, I followed the trustworthiness requirements established by (Amin et al., 2020; Lincoln & Guba, 1985b). By considering concerns such as credibility, transferability, dependability, and confirmability, I attempted to increase the trustworthiness of the research; nevertheless, I accept that this can only be done to a certain degree.

### **5.12 Summary**

This chapter, which is divided into twelve sections, seeks to present the research approach and methods. The study began with a brief introduction on the importance and prevalence of including various strategies related to design and methodologies involved with doing excellent research. The following stage was to determine the interpretive paradigm with the most lucrative potential to influence the study's perception. Furthermore, the interpretive paradigm

was extremely valuable in allowing the researcher to obtain rich, detailed responses in relation to the phenomena of EdTech resources to supervise the curriculum. Thus, I was able to delve deeply into the meanings underlying participants' perceptions/experiences and, as a result, comprehend the elements influencing the use of EdTech resources to supervise curriculum. Exploring the principles of the interpretative paradigm led to the following section, which discussed the qualitative research approach. Qualitative techniques, which are synonymous with the interpretive perspective, revolve around creating in-depth accounts of participants' responses, which allows me to theorise these into concepts. I engaged myself in the research context to better grasp how its parts interact, allowing for the interpretation of holistic perceptions/experiences. Furthermore, one hallmark of qualitative investigations is the utilisation of case studies, which guided the subsequent discussion. Case studies often involve a limited number of persons; in this case, there are sixteen participants. As a result, this study chose an instrumental case study to get into participants' deepest emotions and perceptions. As a result of this section, the study continued to deliberate on the sampling strategy used. Purposive and convenience sampling were used because they allowed me to choose participants who were knowledgeable about the use of EdTech resources to supervise the curriculum and were most accessible in providing important data in producing variables.

Furthermore, the study went on to discuss the participants' histories and settings, if this would offer the reader some background on the participants without sacrificing their identities. Furthermore, data production via semi-structured interviews, focus groups, and reflective activities was adopted to create a discussion on how things were stated. This prompted the next stage of determining how the data would be analysed, which was justified by the guided analysis approach. Furthermore, to overcome any potential biases and concerns, the study expanded to incorporate trustworthiness issues, specifically exploring concepts of credibility, transferability, confirmability, and dependability. Concurrently, ethical issues came to light to emphasise the relevant methodology that was followed in testing the present study. Lastly, the research study highlighted several potential limitations, with the final stage consisting of a summary of the complete study. Knowledge, skills, and attitudes perceptions were highlighted and elaborated in each of the components defined in this chapter. As a result, the next chapter contains a significant analysis of the actual data gathered from participants.

## CHAPTER SIX

### DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

#### 6.1 Introduction

The research design and technique were provided in the preceding chapter in a logical and cogent manner. The interpretive paradigm was used to frame the qualitative research methodology. This made it possible for the study to use the case study method of inquiry, through convenience and purposive sample techniques, and selecting the most appropriate participants who gave rich, in-depth accounts of their integration with curriculum supervision using EdTech resources.

Additionally, this chapter seeks to address the core of the research topic by presenting data and discussing findings. Discussions of the results are important because they spark a dialogue between the literature and theoretical framework to establish truth and/or actualities under the research questions posed to the participant (Goldberg & Allen, 2015). Moreover, after engaging with the data produced through reflective activities, focus group discussions, and one-on-one semi-structured interviews, this approach led to data analysis and interpretation. Moreover, this chapter is based on the findings of the following research questions: What are school managers' perceptions of the use of technological resources to supervise curriculum? How do school managers perceive the use of technological resources when supervising curriculum? Why do school managers perceive the use of technological resources in supervising curriculum in the manner that they do?

## 6.2 Data Presentation

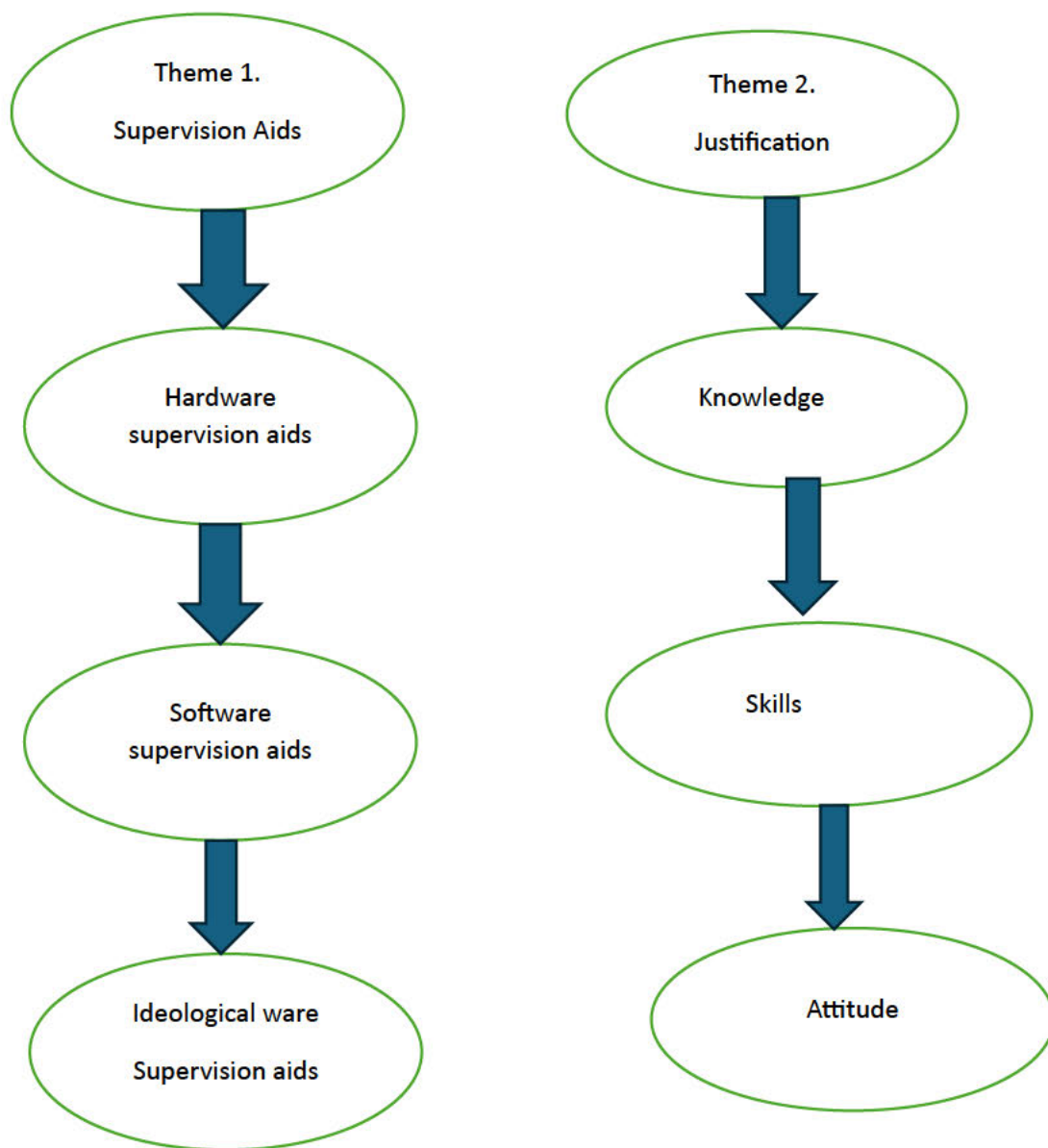
The data generated using reflective activity, focus group discussion, and one-on-one semi-structured interviews were presented, analysed, and interpreted. In addition, data responded to the three questions of the study, the responses were drawn from the findings based on guided analysis of curriculum concepts/components, namely: resources, rationale, content, activities, assessment, accessibility, roles, time, goals, and environment.

**Table 6.1 Analysis of Table (Derived Themes and Categories) arranged according to questions based on instruments (reflective activity, one-on-one semi-structured interviews, focus group discussion) and three knowledge domains.**

<b>Technological knowledge</b>		
1. Which Edtech resources do you use to supervise curriculum?	<b>Theme 1:</b> <b>Supervision aids</b>	<ul style="list-style-type: none"> <li>➤ Hardware</li> <li>➤ software</li> <li>➤ Ideological ware</li> </ul>
2. Why do you use Edtech resources to supervise curriculum?	<b>Theme 2:</b> <b>Justification</b>	<ul style="list-style-type: none"> <li>➤ Knowledge</li> <li>➤ Skill</li> <li>➤ Attitude</li> </ul>
<b>Content knowledge</b>		
3. What content of curriculum are you supervising using Edtech resources?	<b>Theme 3: Course of instruction</b>	<ul style="list-style-type: none"> <li>➤ Professional development</li> <li>➤ Coaching</li> <li>➤ Extra-curricular activities</li> </ul>
<b>Pedagogical knowledge</b>		
4. How do you access Edtech resources to supervise curriculum?	<b>Theme 4:</b> <b>Approachability</b>	<ul style="list-style-type: none"> <li>➤ Financial</li> <li>➤ Culture</li> <li>➤ Physical</li> </ul>
5. Towards which goals are you using EdTech resources to supervise curriculum?	<b>Theme 5:</b> <b>Desires</b>	<ul style="list-style-type: none"> <li>➤ Objectives</li> <li>➤ Outcomes</li> </ul>

		➤ Aims
6. What activities are facilitated using EdTech resources for curriculum supervision?	<b>Theme 6: Matter</b>	<ul style="list-style-type: none"> <li>➤ Content-based</li> <li>➤ Managers ‘centred</li> <li>➤ Supervisees’ centred</li> </ul>
7. What roles do you play in the use of EdTech resources when supervising curriculum?	<b>Theme 7: Responsibilities</b>	<ul style="list-style-type: none"> <li>➤ Organiser</li> <li>➤ Facilitator</li> <li>➤ Leader</li> </ul>
8. Where do you use EdTech resources to supervise curriculum?	<b>Theme 8: Podium</b>	<ul style="list-style-type: none"> <li>➤ Face-to-face</li> <li>➤ Online</li> <li>➤ Blended</li> </ul>
9. When do you use EdTech resources to supervise curriculum?	<b>Theme 9: Schedule</b>	<ul style="list-style-type: none"> <li>➤ Instrumental</li> <li>➤ School time</li> <li>➤ Extra-time</li> </ul>
10. How do you assess/evaluate the effectiveness of the use of EdTech resources to supervise curriculum?	<b>Theme10: Inspection</b>	<ul style="list-style-type: none"> <li>➤ Summative</li> <li>➤ Peer</li> <li>➤ Formative</li> </ul>

Figure 6.1 below elucidates the connections of themes, research questions, and categories. The themes outlined below emerged from the data generated from participants acquired during the interview and focus group.



**Figure 6.1**

**Theme 1:** Which EdTech resources do you use to supervise curriculum?

**Theme 2:** Why do you use EdTech resources to supervise Curriculum?

Additionally, the outcomes and discussions are shown in Table 6.1 utilising thematic analysis following the TPACK framework idea and their prepositions as described in Chapter 3. Further to this, the ten (10) themes were developed by Van den Akker et al. (2003) to address the use of EdTech resources to supervise curriculum. In addition, these themes were employed to generate data from school managers to respond to the primary research questions. The themes are: **supervision aids** (Which EdTech supervision aids do you use to supervise curriculum?); **Justification** (Why do you use EdTech to supervise curriculum?); **Course of instruction** (What content of curriculum are you supervising using EdTech resources?); **Approachability** (How do you access EdTech resources to supervise curriculum, in terms of financial, cultural, and physical access?); **Desires** (Towards which goals are you using EdTech resources to supervise curriculum?); **Matter** (What activities are facilitated using EdTech resources for curriculum supervision?); **Responsibilities** (What roles do you play in the use of EdTech resources when supervising curriculum?); **Podium** (Where do you use EdTech resources to supervise curriculum?); **Schedule** (When do you use EdTech resources to supervise curriculum?); **Inspection** (How do you inspect/evaluate the pedagogical knowledge of school managers towards the use of EdTech resources to supervise curriculum?) (Koehler & Mishra, 2009).

### 6.3.1 Theme 1:

**Supervision aid** is defined as a material that is designed to help facilitate curriculum supervision when using EdTech and knowledge acquisition (Knowles et al., 2022; Mpungose & Khoza, 2022). Additionally, resources are sourced from the three categories comprising hardware, software, and ideological-ware. Further to this, as stated in Chapter Two, these supervision aids correlate with each level of perception. Software supervision aids are correlated with skill perception, hardware supervision aids are correlated with knowledge perception, and ideological-ware resources are matched with attitude perception. In addition to this, one-on-one semi-structured interviews, reflective activity, and focus groups were employed to gather this data to comprehend the EdTech tools utilised by school managers to supervise curriculum. As a result, participants in one-on-one semi-structured interviews attempted to address the descriptive question of which EdTech supervision aids they use to supervise curriculum. This is how participants answered descriptive questions about which technological resources they use to supervise the curriculum.

## Data presentation

### 6.3.1.1 Hardware supervision aids in curriculum supervision

Based on hardware supervision aids, participants' responses were as follows:

**P1** stated, *“I am using the cell phone, the laptop and using the printer to print data when supervising the curriculum.”* **P2, P4** added that, *“I use laptop, tablet, and smart cell phone.”* Further to this, **P3** declared that, *“I mainly I use computer to supervise curriculum.”* However, **P5, P6, P7, P8, P9, P10, P12, P12, P14, P15** and **P16** concur that they *“use things like laptops, projectors, iPhones to supervise curriculum.”* Nevertheless, **P13** differs from other participants when saying, *“I basically, we use the old type of resources which are pen and paper to supervise the curriculum.”*

Additionally, the participants' data showed that a variety of hardware supervision aids were used for curriculum supervision. Further to this, the results of one-on-one semi-structured interviews with school managers showed that they are fully knowledgeable about hardware supervision aids including computers, laptops, and overhead projectors. Moreover, all participants, apart from **P13**, generally agreed after analysing the data that laptops, tablets, and computers are the most common resources used for curriculum supervision. Participants also showed that they are familiar with the various kinds of hardware supervision aids that are useful for curriculum supervision. Furthermore, from the data gathered, it can be inferred that tablets, laptops, and mobile phones are the only tools conveniently employed by school managers for curriculum supervision. In addition, observe **P9** and **P10**, as they stated that *“explaining how they use laptops and overhead projectors to supervise the curriculum”*. This indicates that school managers use both laptops and overhead projectors in their curriculum supervision.

### 6.3.1.2 Software supervision aids used for curriculum supervision.

This is how participants replied when asked about software supervision aids:

**P1** asserted that, *“I use SASAMS to compile mark schedule.”* **P3** added that, *“Normally, I use Microsoft word, Microsoft Excel, and PowerPoint,”* **P4** mentioned that *“I use Microsoft word to supervise the curriculum.”* In addition, **P5** asserted, *“normally use Microsoft Excel.”* Further to this, **P6, P7, and P14** declared that *“we type the documents using Microsoft Word.”* However, **P10, and P16** responded by saying, *“I use SASAMS to supervise curriculum.”*

Moreover, **P12** stated that, *“I use database software, spreadsheet, and geographical information system to supervise curriculum.”*

The data generated from the above participants indicate how participants go about employing software supervision aids to supervise curriculum and guarantee that it is effective. Based on the study findings, SASAMS, MS Word, and MS Excel are among the software supervision aids that make it simple for school managers and supervisees to communicate with district offices. Further to this, the data gathered reveals that school managers use software supervision aids to meet the purpose of curriculum supervision. For instance, school managers should therefore try to use the internet wherever possible (Motshekga, 2011).

### **6.3.1.3 Ideological-ware resources**

This is how participants replied when asked about using the ideological-ware resources.

The following participants, **P1, P5, P11** as well as **P16** responded to the question by articulating that, *“They normally use Socratic method (question and answer method) to supervise the curriculum.”* In response to this question, **P4** responded by providing the following answer, *“I do not tell them what to do but, I give them a chance to add their views.”* Similarly, **P6** said, *“I use discussion method to supervise curriculum.”* However, **P12** and **P13** agreed in their responses that, *“they use managers’ centred approach and different teaching method such as teacher-centred approach and discussion method before the resolution is taken.”*

According to the participants’ findings, ideological-ware resources are informed by curriculum supervision/teaching and learning theories/ideologies, as well as the connectivism and cognitivism theory. In addition, participants displayed a knowledge of ideological-ware resources that can be utilised to supervise curriculum utilising EdTech resources. This indicates that participants obtained adequate training from colleges of education/universities in learning/curriculum supervision theories. Furthermore, based on the responses of the participants, it was clear that participants use EdTech supervision aids to supervise the curriculum. This suggests that school managers were using the Policy on South African Standards for Principals as well as the CAPS document to supervise the curriculum. In support of this, the school manager needs to have a knowledge of EdTech supervision aids that support teaching and learning, assessment, and curriculum supervision (Marishane (2016, p. 13).

## **Theme 1: Discussion**

According to Khoza (2018); Mlaba (2020) and Zuma (2020), an asset is any tool used for curriculum supervision. In addition, Nhlongo (2020) share similar sentiments with Mpungose (2017) that machines, networking, and any other equipment used to supervise curriculum are examples of hardware supervision aids. In this regard, Knowles et al. (2020) claim that hardware supervision aids make supervision more appealing by improving its performance. As a result, vertical curriculum supervision is influenced by hardware EdTech supervision aids. Thus, school managers regard Edtech supervision aids positively when they receive guidance from informed documents such as personal administrative measures (PAM), the Policy on the South African Standards for Principalship, and CAPS (Dasruth, 2020; Sunker, 2021). In other words, content knowledge influences the conduct of school managers. The findings reveal that school managers indeed understand the use of EdTech supervision aids to supervise curriculum. However, one participant (P11) declared that they use traditional supervision aids such as a pen and a paper to supervise curriculum instead of using EdTech supervision aids, which is time-consuming. This implies that the participant is in line with the declared policy. In regards to this, Motshekga (2011, p. 9) affirms that the teacher should therefore have magazines and newspapers available in the classroom for learners to use in their activities and acquire sets of pictures for classroom activities.

However, Reussner et al. (2016) concur with Hugill (2018) that a software supervision aid is anything that tells the hardware what to do and how to do it during the curriculum supervision process. Nevertheless, Mlaba (2020) supports (Khoza, 2012) that software supervision aids are materials that were made for the hardware to display information that facilitates curriculum supervision. Furthermore, the decision to use these supervision aids is heavily influenced by the needs and perceptions of school managers, thus, knowledge implementation and methodologies are required and used. Similarly, school managers can train teachers on how to use diagnostic tools to analyse learners' performance using TikTok videos (software) downloaded from the internet and displayed on a flat panel NES smart interactive screen (hardware). This is per the study's findings. Furthermore, school managers stated that they use laptops and tablets at the schools with various application software to submit. Thus, school managers rely on technological knowledge. Thus, software assists are informed by horizontal curriculum supervision in which school managers are perceived as driven by skill to use

EdTech supervision aids guided by curriculum supervision methods such as administrative supervision (Jonyo & Jonyo, 2019).

In addition, Nkambule (2022) agree with Moyambo (2023) that ideological-ware supervision aids are any curriculum supervision methods/strategies used in the school-by-school managers to supervise curriculum such as autocratic, bureaucratic, laissez-faire connectivism, as well as cognitivism. Furthermore, when school managers use EdTech supervision aids that rely on pedagogical knowledge, as such ideological-ware supervision aids are the ones that drive any curriculum supervision (Khoza & Fomunyam, 2020; Mpungose, 2020c). Plus, the findings indicate that school managers rely on theories such as constructivism, behaviourism, and cognitivism when supervising curriculum. Consequently, pragmatic curriculum informs ideological-ware resources, with school managers supervising curriculum based on their attitudes and theories (Khoza & Mpungose, 2022).

### **6.3.2 Theme 2: Justification**

Curriculum supervision with EdTech supervision aids is critical to carrying out the prerequisite curriculum. Further to this, school managers understood why they used EdTech supervision aids to supervise curriculum and relied more largely on the knowledge, skills, and attitude justification, as shown in Figure, 6.2. Furthermore, participants noted that EdTech supervision aids (tablets, laptops, desktops, cell phones, and others) play a critical part in obtaining data and storage. Similarly, participants' data and concerns presented indicate that school managers' perceptions of the use of EdTech supervision aids to supervise curriculum are based on knowledge, skill, and attitude rationales. Thus, one-on-one semi-structured interviews, online reflective activities, and focus groups were employed to gather data to understand why school managers supervise curriculum utilising EdTech supervision aids.

According to Van den Akker et al. (2003), rationale is integral to curriculum supervision, implying that rationale is a starting point for any curriculum, whether enacted or implemented. In this context, we concentrate on curriculum as implemented, as it is supervised by school managers, who are viewed as curriculum supervisors and are required to understand the perceptions that underpin their curriculum supervision. Thus, in this study, the concept of rationale is named as concept justification. With the proposition of curriculum supervision

desires, personal is replaced by attitude perception, societal is replaced by skill perception, and content is replaced by knowledge perception.

School managers are expected to comprehend the three levels of perception (attitude, skill, and knowledge) in this study. Further to this, they must be able to understand the association between attitude perception and aims; skill perception and outcomes; and knowledge perceptions

## **Data Presentation**

### **6.3.2.1 Knowledge reasons for using EdTech supervision aids to supervise curriculum**

According to the data, **P1** responded, *"I use EdTech supervision aids to supervise curriculum because it is a departmental requirement because the department does not accept untyped documents such as mark schedules."* **P3** added, *"I use EdTech supervision aids for performing the school administration and organisation of work."* Further to this, **P4** and **P5** declared that, *"We are forced by the Department to use EdTech supervision aids, to improve and store data for a long period of time and they help us to email the data to the Department especially the learner attendance registers on weekly basis."* Moreover, **P8** responded by asserting that, *"I am using EdTech supervision aids to check whether teachers are in line with their annual teaching plans and are up to date."* In addition, **P9** replied that, *"EdTech supervision aids stimulate/ draw attention of learners when you are teaching using them."* However, **P10** responded by articulating that *"We try to incorporate and expose our learners, ourselves, and stakeholders into modern systems of teaching and learning and curriculum supervision because they are much practical."* Similarly, to **P10**, **P11** responded by declaring that, *"they easily help to retrieve data processed."* **P12** answered that, *"I use EdTech supervision aids to keep records of all learners and teachers' marks/scores, and they are kept safe. Similarly, I use them to ensure that lesson during teaching process is more effective. Furthermore, insists that visual learning helps learners to understand easily and become happier."* **P14** responded by stating that, *"The main aim to use EdTech resources to supervise curriculum, is to advance the curriculum in technology, so that the curriculum, we are using is in line with the 4<sup>th</sup> industrial revolution and to Fastrack the errors because technology is moving very fast and record the errors you find out."* Furthermore, **P15** responded by articulating that, *"they use EdTech resources to supervise curriculum to ensure that all activities are done, we are not behind/on*

*par with the annual teaching plan and check that we meet the target on task.*” Consequently, **P16** responded by stating that, *“We use EdTech resources to supervise curriculum with an intention to keep record for the department officials, and to keep the records for learners’ marks for tracking them and to check whether the resolution taken for curriculum improvement are well implemented.”*

Furthermore, the findings show that all participants have operational knowledge about technological supervision aids acquired at tertiary institutions. Some participants, however, appear to perceive the use of technological supervision aids to supervise curriculum as punishment/threat. For instance, **P4** and **P5** declared that *“We are forced by the Department to use EdTech supervision aids.”* Furthermore, participants remain silent on Department of Education manuals and policy materials. This jeopardises the intended curriculum (curriculum supervision), which must be implemented properly and successfully if the policy contents are not followed. This shows that school managers are unfamiliar with curriculum supervision policy documents/manuals. This poses a significant risk to curriculum supervision using EdTech supervision aids. As a result, school managers will need to become acquainted with legislation on curriculum to broaden their knowledge of the usage of EdTech supervision aids. Simply, school managers must value ongoing professional growth to comprehend the advantages of employing EdTech supervision aids to supervise curriculum.

#### **6.3.2.2 Skill reason for using EdTech supervision aids for curriculum supervision**

**P7** replied by asserting that, *“I EdTech use resources because they save time when you are communicating with staff members especially when you communicate through using e-mail or WhatsApp.* Furthermore, **P16** supported **P7** by stating that, *“I use EdTech resources because they make easier to communicate with supervisees.”*

It was critical and remarkable for participants to recognise the significance of EdTech resources in supporting curriculum supervision in schools. The societal (skill) rationale is crucial to curriculum supervision because it supports the curriculum supervision culture in schools. Furthermore, just three participants identified reasons for using EdTech resources to supervise curriculum concerning society, indicating that the participants were unaware of the critical role performed by society in curriculum supervision. As a result, there is a strong indicator that school managers must increase their interest in society to meet the targets of curriculum

supervision. However, of the sixteen participants, **P16** and **P7** most value the role of society in curriculum supervision. As a result, this situation creates a risk and will have an impact on the curriculum's implementation. Thus, school managers must learn to employ EdTech resources for curricular supervision with the assistance of society. Consequently, if various EdTech resources can be used for communication during the curriculum supervision process, school managers can gain support from society.

### **6.3.2.3 Attitude (personal) reasons for curriculum supervision**

Both **P7** and **P9** concur in their responses by articulating that, *“they use EdTech resources such as school WhatsApp group to save their time and energy when they want to see their supervisees and parents than moving to see them face-to-face.”*

Participants' data have revealed that a minority of school managers use EdTech supervision aids to supervise curriculum because they are exposed to EdTech supervision aids such as cell phones and tablets used to send messages to their supervisees. Participants strongly believe that EdTech supervision aids work to expediate the communication with supervisees. Both **P7** and **P9** articulated, *“they use EdTech resources such as school WhatsApp group to save their time and energy when they want to see their supervisees than moving to see them face-to-face.”* This suggests that participants' perceptions have also used EdTech supervision aids for their own benefit. However, most of the participants disregard the use of EdTech supervision aids for their own justifications. In other words, participants are hesitant to believe that EdTech supervision aids can address their personal needs.

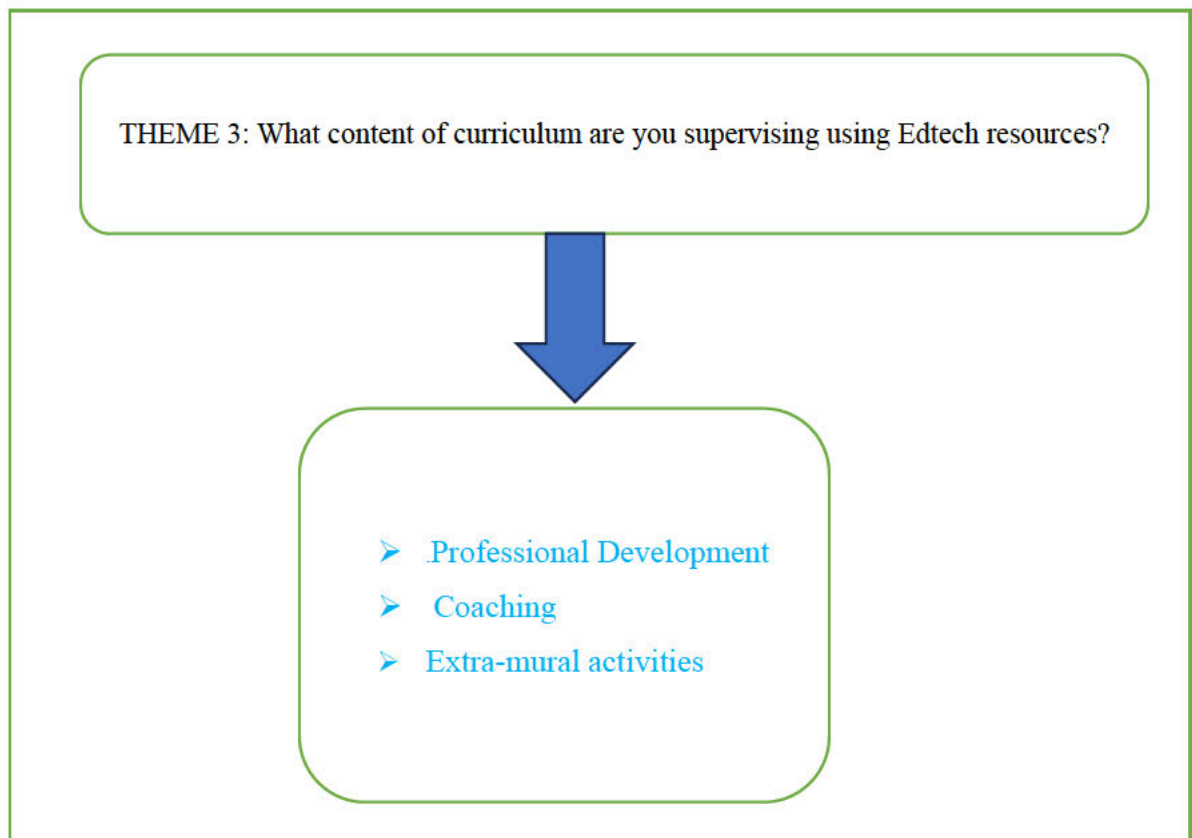
## **Theme 2 Discussion**

Khoza (2015) and Khoza (2016a) concur with Zuma (2019b) and Makumane and Khoza (2020) that attitude justification is informed by individual capabilities during curriculum supervision. For example, a school manager may be influenced by beliefs/passion to supervise curriculum using EdTech resources such as cell phone/laptop. This is consistent with the study's findings since school managers revealed that EdTech resources save them time. Thus, Msimango (2023) claimed that attitude justification is influenced by the diagonal of the curriculum and pedagogical knowledge. School managers personally use EdTech supervision aids to supervise curriculum to ensure that the curriculum supervision process is effectively implemented.

Furthermore, Prenger et al. (2021) argue that when school managers are motivated by attitude justification, they handle problems and plan on their own. As a result of participants' responses, I can deduce that school managers trust in the use of EdTech supervision aids to supervise curriculum. In other words, school managers' responses indicate that they have a personal interest in the use of EdTech supervision aids. Furthermore, this has a significant impact on their curriculum supervision using EdTech supervision aids. Understanding of EdTech supervision aids is driven by their self-identification as well as the race/culture they represent. Darling-Hammond (2019) and Naidoo (2019) claim that attitude justification permits school managers to develop personal expertise. In addition, participants seem to use Edtech supervision aids for skill justification when they connect through WhatsApp to communicate with parents and supervisees. This suggests that EdTech supervision aids play an integral part in disseminating information to the school community. Moreover, Zuma (2019b) concurs with Mpungose (2017) that skill justification is based on placing the needs of the community (supervisees) at the centre of curriculum supervision. With regard to technological knowledge, skill justification is defined as a collective principle of capability, where there is no specific answer to guide capabilities (McDermott, 2020). Similarly, Alvunger (2018) shares an opinion with Van Lier (2014) that technological knowledge is linked with horizontal curriculum which is described as openness of the curriculum to the collective principles of society. As a result, skill justification suggests that the curriculum prioritises the community. The community is made up of many diverse people, each with their own set of needs and abilities. This necessitates that the curriculum be flexible to these differences and similarities. The horizontal curriculum is the only curriculum that can fulfil the needs of the community. Furthermore, the curriculum standards that support a horizontal curriculum are open and dependent on community demands.

Furthermore, from the above school managers' responses, I can deduce that school managers are more interested in knowledge perception because most participants draw from policy documents and education prescripts when supervising curriculum using EdTech supervision aids. According to Khoza (2016a), knowledge perception places the content at the heart of curriculum supervision. This is evident by their lengthy and detailed responses that directly address curriculum supervision subjects. According to Khoza (2016a), knowledge perception places the content at the heart of curriculum supervision. Similarly, Khoza (2018) has the same opinion as Khoza (2019c) that knowledge perception is driven by the vertical side of the curriculum and content knowledge. This suggests that school managers supervise curriculum

using EdTech supervision aids governed by certain documentation and legal frameworks. Moreover, Nene (2019) claims that school managers use supervision aids to supervise curriculum that is influenced by the intended curriculum (CAPS document). As such, when school managers use EdTech supervision aids to supervise curriculum, they are more focused on their knowledge perception as they rely on manual and policy documents to supervise curriculum using EdTech supervision aids. Furthermore, Motshekga (2015, p. 10) declared that school managers should supervise the school as an organisation, and supervise the quality of teaching and learning and securing accountability. In addition, the theme given below emerged from the data generated by participants from interviews and the focus group.



**Figure 6.4 generated from the TPACK framework under the course of instruction.**

#### **6.3.2.4 Theme 3: Course of instruction**

According to Olajide (2019), a curriculum course of instruction is simply defined as the totality of what is to be supervised in a school system. Further to this, the latter study further avers unanimously that the course of instruction components of curriculum supervision situation refers to the important facts, principles, and concepts to be supervised such as guiding supervisees in the right direction, helping and advising the supervisees in their performance to achieve the established objectives and give the supervisees the prompt feedback. Furthermore, as shown in Figure 6.4, courses of instruction can be distinguished as professional development knowledge, coaching knowledge, and extracurricular activities knowledge. Furthermore, the concept content is replaced by the concept, the course of instruction in this study, and the course of instruction is coordinated with perception levels.

Moreover, Marishane (2016, p. 13) is vocal on the Policy on the South African Standard for Principalship (PSASP) that a school manager needs to know about supervision aids that support curriculum supervision as well as White paper 7 on e-education, September 2004. Similarly, research findings show that most school managers have access to laptops and tablets for curriculum supervision. This indicates that school managers are one hundred per cent compliant with PSASP. In addition, the findings reveal that some school managers do utilise tablets, USBs, and cell phones to supervise curriculum. For example, using videos to coach a novice supervisee on how to face and address bullying in their classrooms. Thus, this questions the PSASP and CAPS documents which are silent on the use of printers, tablets, cell phones, and USBs to conduct both coaching and extra-curricular activities using EdTech supervision aids. In addition, Motshekga (2011, p. 5) argues firmly that curriculum supervision should be carried out using various curriculum differentiation ideas. In contrast, data shows that some school managers do not monitor certain courses of instruction to supervise curriculum such as extra-curricular activities (music, farewell functions, etc). As a result, regardless of whether CAPS or PSASP emphasise the usage of these supervision aids, there is an imbalance in their use. This suggests that school managers are mostly driven by knowledge perceptions at the expense of the other two perceptions when executing their standard duties (course of instruction).

## Data presentation

### 6.3.2.5 Professional development in curriculum supervision

According to the data generated, this is how participants replied when asked about what content of curriculum they are supervising using EdTech resources.

**P1** agrees with **P4, P5, P6, P8, P9**, as well as **P15** when responding to the question by articulating that, *“They focus mostly on prescribed guidelines of the curriculum which are CAPS document and ATP (annual teaching plan), monitor the implementation of teaching and learning, where they look at lesson plans and daily preparations, lastly the achievements of the learners using the tracking tools and reporting to both parents and department.”*

During the interview processes, participants were more specific and provided in-depth responses as indicated below.

**P2:** *“I use it for, for teaching and learning such as technology and natural sciences, I use it to analyse results after I have done assessment.”* **P3:** *“I use it to check the work done on weekly basis, the work that has done by the departmental heads, to check the curriculum coverage on weekly basis, and check if educators and departmental heads when they go to class are well prepared, most of the time I supervise the fundamental subjects, (Isizulu & English) because they are the killer subjects and cause learners to fail”.* **P7:** *“I used to supervise the curriculum coverage to see if educators follow their given ATPs and to ensure that learners are well taught. I also used to supervise/manage the leave and manage the environment of the school whether is conducive to allow teaching and learning to take place.”*

Furthermore, the school managers demonstrate an obvious understanding of the content that needs to be supervised in the school at this stage. Further to this, data from participants suggested that school managers recognise the importance of EdTech supervision aids in curriculum supervision. For instance, **P7** asserted that, *“I used to supervise the curriculum coverage to see if educators follow their given ATPs and to ensure that learners are well taught. I also used to supervise/manage the leave and manage the environment of the school whether is conducive to allow teaching and learning to take place.”*

### 6.3.2.6 Coaching in Curriculum Supervision

**P2:** *“I encourage supervisees to use EdTech resources help them to be familiar with technology. They help supervisees to develop passion for using them in their teaching and learning.”* Further to this, *“they are used to communicate, like sending messages when there is spelling bee, and teach supervisees to search for words in Google as well as how to pronounce words.”* Moreover, **P7** avers that, *“I use EdTech resources to conduct advocacy by projecting the processes on the screen so that the newly appointed teachers can get orientation about quality management system.”*

The data from the participants reveal that some school managers do coach supervisees to enhance curriculum supervision using EdTech supervision aids. Coaching refers to the process that enables curriculum supervision to occur and thus performance to improve (Bhavsar-Burke et al., 2022; Lackritz et al., 2019). This is in line with **P12** who stated, *“I use EdTech resources to make sure that teaching and learning become easy for supervisees to reach the target of the school which hundred percent achievement.”*

### 6.3.2.7 Extra-Mural Activities

**P1** responded, *“I use EdTech resources to downloads questionnaires for supervisees for self-development in all aspects of life such as sports activities, and I sent questionnaires to supervisees so that they respond to questions.”*

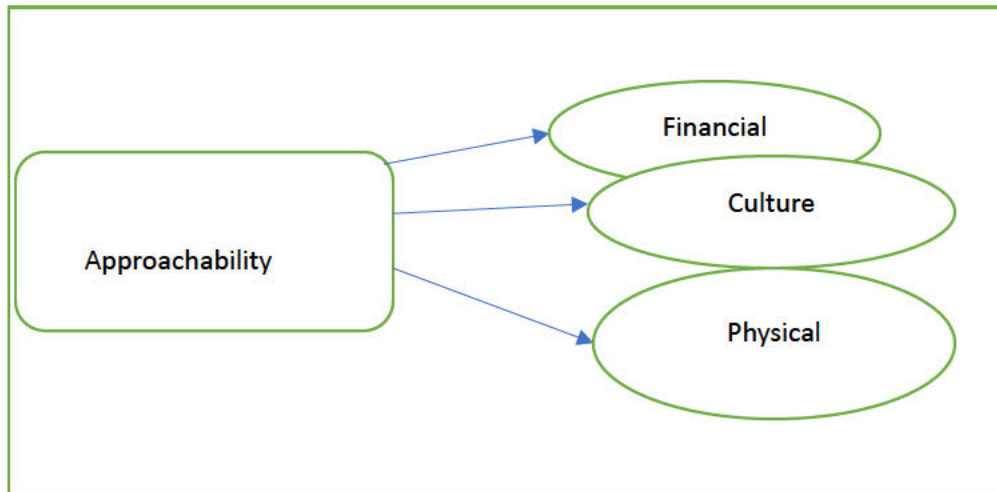
From the above participant’s response, I can deduce that this school manager is influenced by attitude perception when using EdTech resources to supervise curriculum.

## Theme 3: Discussion

The school managers’ responses revealed that they do understand content knowledge as they indicated in the policy on the South African standards for principalship and on the policy handbook for educators. In this study, the concept of course of instruction is defined as a sequence of lessons, study, or coursework in curriculum supervision, which is intended to impart knowledge or skills to supervisees (Baird & Mollen, 2023; Hansen & Hoag, 2018;

Watkins Jr & Wang, 2014). Furthermore, the data show that school managers rely heavily on knowledge perception while supervising curriculum instruction through which they gain access and support from the Department of Education by furnishing them with EdTech supervision aids. In other words, the influence of all three perception levels is not balanced. In addition, professional development relates to the core course of instruction, for instance for school managers to perform beyond expectations need to be professionally developed. School managers are influenced by knowledge perception depending on the Policy on the South African Standards for Principalship and on the policy handbook for educators which articulate the core purpose of a school manager as leading teaching and learning in the school, working with and for the community and managing/supervising and advocating extra-mural activities (Marishane, 2016, p. 10). Further to this, Joshua (2007, pp. c-64) on the policy in the handbook for educators states clearly, in the Employment of Educators Act 76 of 1998, that the school manager is responsible for professional development/supervision of a public school, and to play an active role in promoting extra-curricular activities in the school. Grant (2014), Stark et al. (2017), and Fallon et al. (2019) define the coaching course of instruction as a solution-focused way to use coaching to foster school improvement. For example, allowing supervisees to engage in their own personal growth and work together to complete forms for registration in a Bachelor of Honours programme at higher education institutions. Such framing has influenced school managers to draw on skill perception and technological knowledge while supervising curriculum as implemented. In addition, Narkabilova (2021) has a similar opinion as Adeyemo (2010) that extra-curricular activities are defined as programmes outside of the regular school curriculum and they focus on a specific activity, goal, or purpose. As a result, the findings reveal that some school managers do possess technological knowledge, content knowledge, and pedagogical knowledge since they apply all three knowledge domains in their curriculum supervision using EdTech supervision aids.

As a result, school managers are being influenced by attitude perception and pedagogical knowledge when supervising curriculum using EdTech supervision aids. The success of such initiatives is dependent on the perceptions and preferences of school managers.



#### **Theme 4: Approachability**

Accessibility in this study emerged as concept approachability because if EdTech supervision aids, including laptops, routers, computers, and overhead projectors, are available, both school managers have a strong probability of achieving the objectives of curriculum supervision if the EdTech supervision aids are reachable for all in schools. Thus, approachability in the context of education refers to the right to an education regardless of political affiliation, socioeconomic status, or cultural background (Zuma, 2019b). Similarly, Section 29 (1) of the South African Constitution states that everyone should have the right to basic education, and the government must make it available and accessible. As a result, everyone has the right to an equal chance at school. Moreover, basic education requires all schools to be No-Fee. Currently, the No-Fee school policy abolishes school fees in the poorest 40% of schools nationally for learners from Grade R to Grade 9 (Branson & Lam, 2017; Maphalala & Khumalo, 2023). According to Dietz et al. (2021), approachability is about physical access to education; meaning the school is reachable for all. Furthermore, cultural access entails addressing any cultural barriers that impede the right to an education. However, financial access means removing financial impediments to the right to an education. In respect to this study, physical approach/access is aligned with knowledge perception which is then named knowledge approach/access (meaning approach/access to formal policies of curriculum supervision). Financial approach/access is linked with skill perception which is named as skill-approach/access (meaning approach/access to education depending on financial dynamics of supporting the system). Cultural approach/access is aligned with attitude perception which is named as attitude-approach/access (meaning one has the right and choice to adopt a specific culture). Some of the categories are most important to me because, while they may be outside the scope of the school, they still

have an essential effect on what happens in the school. Thus, approachability impacts what happens and how it happens in school.

During the focus group, reflective and semi-structured interview participants responded as follows:

## **Data Presentation**

### **6.3.2.8 Physical access/approach for curriculum supervision**

**P1** indicated that, *“In the institution there are laptops available.”*

As a result, it is important to note that the department's position is to ensure that school managers have access to EdTech supervision aids in the school, regardless of physical limitations. Furthermore, it is widely known that school managers in schools employ their own EdTech supervision aids for curriculum as planned. As a result, **P3** stated *“Unfortunately, I use my personal laptop and tablet, I use my personal finances.”* In addition, **P2** declared that *“I use my money to buy data for the school to operate normally.”* This demonstrates that our schools do not have sufficient EdTech supervision aids, yet school managers use what they must to meet the purpose of curriculum supervision utilising EdTech supervision aids. Curriculum supervision implementation is jeopardised when school managers pay for EdTech supervision aids out of their own pockets as not all school managers have unlimited funds.

### **6.3.2.9 Financial access for curriculum supervision**

Most of the participants (**P1, P2, P4, P5, P6, P7, P9, P14, P15,**) supported **P16** who responded that, *“I use tablet with data for connection that was given to us by Department of education.”* However, **P13** supported other school managers by stating that, *“Financially, we are sponsored by LTSM money which I beings given to the school by the department and the school provides us with funds to buy data and pay for Wi-Fi to access internet both at work and at home.”* In addition, **P12** added that, *“We have a sponsor as a school, and we have some of donation being offered by the parent (R100) used to buy data.”* School managers must make difficult decisions to ensure that EdTech supervision aids are used for curriculum supervision. Most participants reported that the Department of Education provides EdTech supervision aids by transferring

money straight to school bank accounts for schools to spend on curriculum supervision aids. This promotes the use of EdTech supervision aids for curriculum supervision in schools. This allows school managers to attend online workshops to save money on gas and printing because documents can be downloaded and saved to their laptops. This indicates that school managers are covered in terms of EdTech supervision aids.

#### **6.3.3.10 Cultural approach for curriculum supervision**

**P1** explained, *“I also have a WhatsApp group with the parents, whom they believe is a good platform to insult school managers about their dissatisfaction.”* **P2** added, *“I do have challenges with Facebook because the parents perceive it as platform that promotes bad conduct to society.”*

According to participants' data, the usage of social media is not recognised as a strategy for curriculum development and supervision. This suggests that there is no culture of tolerance amongst the school community. This hinders the progress of curriculum supervision using supervision aids if school managers experience challenges when supervising curriculum using these sites. In other words, school managers have a task to do, which is to persuade parents to perceive social networks as a platform for promoting education.

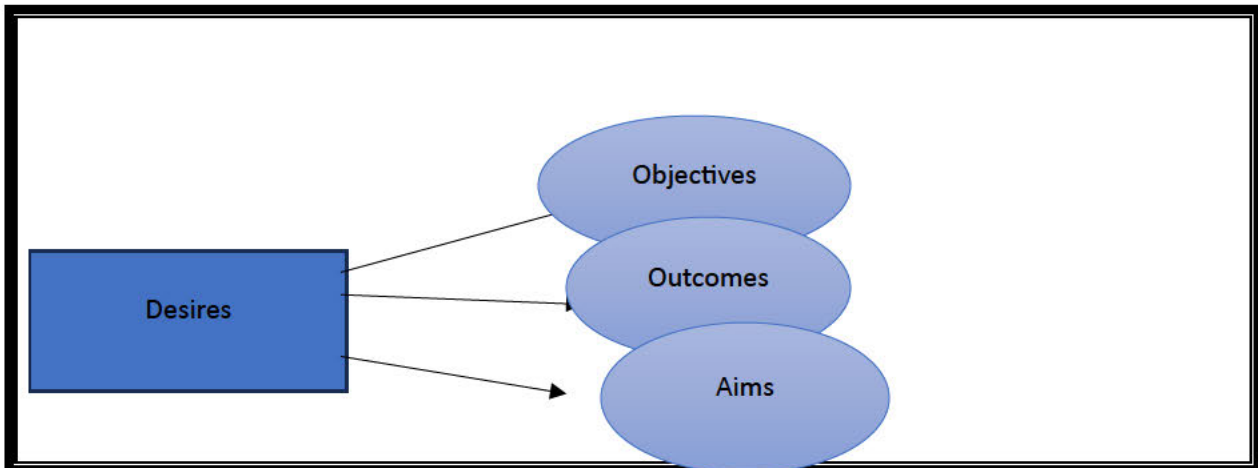
#### **Theme 4 Discussion**

School managers indicated that they get support from the Department of Education which provides them with EdTech supervision aids and data for access to online resources. Moreover, this speaks to skill perception. Participants also stated that they have access to EdTech supervision aids through WhatsApp and Facebook. In this regard, the Department of Basic Education provides funding to school managers to improve curriculum supervision using EdTech supervision aids. This is related to financial approachability because most EdTech supervision aids are furnished to school managers/schools by the Department of Basic Education to redress the imbalances of the past, whereby the schools were not treated fairly in terms of EdTech supervision aids. In respect of the above, CAPS documents, which guide the curriculum supervision, are established on the principles of human rights, inclusivity, and environmental and social justice: which infuse the principles of and practices of social and environmental justice and human rights as defined in the Constitution of the Republic of South

Africa. In addition, the CAPS document accentuates that inclusivity should become a central part of school, planning, teaching, and curriculum supervision. Furthermore, Ashfaq et al. (2022) argue that cultural approachability refers to the assistive EdTech supervision aids to supervise curriculum effectively in and out of the school. In addition, Tariq and Latif (2016) concur with Krasniqi et al. (2022) that assistive EdTech supervision aids are intended to support the functions of the individuals. Further to this, cultural approachability is informed by attitude perception and pedagogical knowledge in which school managers enact a diagonal curriculum influenced by their own perceptions/self-identities. Furthermore, Naim and Dhanapal (2017) claim that physical approachability refers to the access and design of EdTech supervision aids used in curriculum supervision process. Additionally, physical approachability requires school managers to be enlightened by knowledge perception and content knowledge, with their activities governed by Department of Education documents and policies. Moreover, Mlaba (2020) contends that knowledge perception-driven curriculum puts the course of instruction at the core of curriculum supervision. As a result, when school managers use EdTech supervision aids guided by policy documents, they are supervising the curriculum to accomplish the curriculum supervision objectives incorporated in the vertical/performance curriculum. In addition, the data gathered from the participants infer that school managers are driven by knowledge perception and content knowledge when approaching/accessing the curriculum supervision using EdTech supervision aids. As a result, they are positioning the objectives of the Department of Education at the centre of curriculum supervision when using the EdTech supervision aids. Moreover, Joshua (2007, pp. B-63), on the policy handbook for educators, declares that the “State/ Department of Education should transfer funds and other movable assets of the state to public schools.”

### **Theme 5: Desires**

The Department of Education’s goal is to ensure that the monitoring of performance, sharing of information and solving of problems in connection with curriculum supervision are addressed (Ngole & Mkulu, 2021b). Moreover, Ismail et al. (2018) concur with Wanzare (2012) that curriculum supervision plays a great role in ensuring that teaching practices and the course of instruction to be taught are followed. In addition, it is important to acknowledge the fact that curriculum supervision is a guiding tactic in ensuring that changes within the curriculum supervision are easy to undertake (Glanz, 2014; Russell, 2017). In this respect, a curriculum supervision plan is essential in this regard for ensuring that curriculum revisions and implementation are followed.



**Figure 6.6 levels of desires in curriculum supervision**

## **Data Presentation**

### **6.3.3.1 Objectives of curriculum supervision**

**P4** responded, *“Our main goal deals with why we are here in this place, teachers are here to teach, and learners are here to learn at the end, the learners must progress. Further to this, EdTech resources help learners to learn. In a nutshell, the aim behind is to make sure that we apply and utilise them in a sense that learners do perform, even if they are limited/scarce in number but the little that we have, we utilise them for a long-term goal which is the performance of the learners.”* Further to this, **P6** added that, *“I use EdTech resources to expect good result by the end of the year so that parents can be happy. EdTech resources can assist the school to make learners achieve the basic skills such as writing.”* Similarly, **P9** asserted that, *“My goal to use EdTech resources to establish critical thinking in supervisees as well as to change their mind set in education system. To have an appropriate communication and being understandable about the subject matter when teaching.”* In addition, **P10** avers that, *“I use EdTech resources to achieve excellence in teaching and learning.”* Correspondingly, **P11** and **P12** have shared similar sentiments as they declare that *“I use EdTech resources to achieve excellence in teaching and learning.”* Consequently, **P15** and **P16** confidently state that, *“I supervise curriculum to ensure that effective teaching and learning is taking place, assessment (formal and informal) is done according to the correct procedures, to promote the learners and to report the progress of learners to parents.”*

Moreover, the Department of Education's objective of curriculum supervision using EdTech supervision aids is to ensure that school managers can locate, evaluate, manipulate, manage, and communicate information from different sources. Furthermore, data produced has revealed that school managers follow the mandate of the Basic Department of Education. For instance, P9 said, *"My goal to use EdTech resources to establish critical thinking in supervisees as well as to change their mind set in education system. To have an appropriate communication and being understandable about the subject matter when teaching."* This corresponds with P10 who responded that, *"I use EdTech resources to achieve excellence in teaching and learning."* This suggests that school managers' objectives to supervise curriculum using EdTech supervision aids are in line with White Paper 7.

### **6.3.3.2 Outcomes of the Curriculum Supervision**

P2 *"I use EdTech resources because they help us to make our lives easy and they help our supervisees to be familiar with technology."* In addition, P3 asserted that, *"I use EdTech resources for efficiency, because a paper and a pen can take long time, but EdTech resources fast track the messages to the parents. The EdTech resources assist to relay electronic messages, are time efficient and the society is moving to the Forth Industrial Revolution globally. EdTech resources assist to modernise the society."* Further to this P7 responded, *"I use EdTech resources because they make easy to communicate with the educators. As a result, I communicate with my colleagues at any time."* Furthermore, P16 responded, *"I use EdTech resources to quickly communicate with my supervisees."*

Additionally, outcomes are what supervisees are required to demonstrate when a curriculum supervision plan has been completed and EdTech supervisory aids have been used and deployed. According to the overall findings, the performance of the supervisees accounts for one-quarter of the participants' outcomes, which is consistent with the White Paper 7. As a result, P7 concurs with P16 who responded, *"I use EdTech resources because they make easy to communicate with the educators. As a result, I communicate with my colleagues at any time."* This suggests that the outcomes of curriculum supervision using EdTech supervision aids can be perceived following a defined curriculum supervision schedule.

### **6.3.3.3 Aims of the Curriculum Supervision**

**P1** responded that, *“I want to influence supervisees to be familiar with technology, I want to collect data as much as I can, and it makes easy for me to network and collect information.”* In addition, **P2** responded, *“I use EdTech resources in order to help supervisees to develop passion for using them in teaching and learning. They can also motivate the learners to develop passion for using themselves”* In addition, **P5** And **P12** shared similar emotions when responding that, *“I use EdTech resources so that teachers do not feel the high volume of work. I want supervisees to enjoy the work since EdTech resources simplify things.”* Furthermore, **P13** concurs with **P14** as they asserted that *“I use EdTech resources to ensure that supervisees quickly get urgent messages from the department.”* However, **P16** replied that, *“I want to save or keep files in a laptop, to create space in the office by eliminating big and unwanted files.”*

### **Theme 5: Discussion**

Based on the responses of the above school managers, I deduce that school managers are more enthusiastic about knowledge perception. This is evident from their lengthy and detailed responses that address curriculum supervision directly. Mules (2018) concurs with Khoza (2016a) as well as Mpungose (2016) in claiming that knowledge perception places the content at the centre of curriculum supervision. Likewise, Carter II (2022) and Hufnagel (2015) argue that knowledge perception/experience is a source of knowledge for school managers, as judgements are framed by research, values, and attitudes. Similarly, school managers’ responses are thus influenced by their grasp of their fundamental duties, meaning knowledge of the core obligations which may be measured by the supervisees’ great performance. As a result, they have a better understanding of Department Basic of Education rules, objectives, and policies and are unwilling to compromise. Additionally, adopting EdTech supervision aids to supervise curriculum is thought to be a key factor for school managers who are concerned with knowledge perception. In addition, it is evident from this angle that school managers use EdTech curriculum supervision aids to address the issue of curriculum supervision. Since a vertical/performance curriculum and content knowledge put content at the core of instruction, school managers supervising curriculum using EdTech supervision aids should be aware of these factors. Furthermore, Saffa (2019, p. 38) claim on strategic objective of the Department of Basic Education named as Revised Five-Year Plan Strategic Plan that the school managers are responsible for implementation of ICT in schools, of school managers are observant to it. This suggests that other levels of perceptions, as well as pedagogical

knowledge, are completely ignored/overlooked during the process of curriculum supervision using EdTech resources.

**Theme 6: Matter (Activities)**

School managers are required to carry out various activities during the curriculum supervision process to make effective and efficient use of EdTech supervision aids. Additionally, based on the information gathered from the participants, I can infer that school managers use EdTech supervision aids for a variety of activities, as shown in Table 6.2 below. This demonstrates that the participants' responses were conflicted. In addition, activities are also advantageous in curriculum supervision if they are designed to benefit supervisees and improve curriculum supervision.

**Table 6.2 Levels of matter in curriculum supervision**

Content-based activities	School managers activities	Supervisors-based activities
❖ Planning	❖ Check lesson preparations	❖ Lesson preparations
❖ Controlling	❖ Moderation of tasks	❖ Assessment plans
❖ Continuous professional development	❖ Communication	❖ Assessment task
❖ Organising and admission	❖ Submissions	❖ Teaching & learning

**Data presentation**

**6.3.3.4 Content-based activities in curriculum supervision**

**P1** responded, “*I download templates for monitoring and tracking learners progress and teachers’ progress.*” **P2** and **P4** responded, “*I use EdTech resources to manage/supervise the curriculum because by keeping records because they are easily editable.*” Further to this, **P12** responded by articulating that, “*I use EdTech resources to teach geography, there is a software which does not force me and the learners to go to the field.*” In addition, **P14** replied, “*I use*

*EdTech resources to analyse results in the parents' meeting with an aid of laptop and PowerPoint term per term."*

Additionally, I deduce from the participants-generated data that school managers are unaware of the primary tasks they are supposed to complete, and the expectations placed on them. Because of this, most school managers are not carrying out their primary duties. Further to this, Saffa (2019, p. 41) is vocal on the Revised Five-Year Plan Strategic Plan which declares that the school manager has a responsibility to develop curriculum and assessment policies and monitor and support their implementation. Similarly, Marishane (2016, p. 17) is outspoken on Policy on the South African Standards for Principalship that a school manager needs to have knowledge of practices and procedures related to quality assurance systems, including whole-school review and evaluation and performance supervision/management. This suggests that school managers are not well capacitated in their work and are violating the Department of Basic Education policy.

#### **6.3.3.5 School managers'-based activities**

**P3** asserted that, *"I use the EdTech resources assist to facilitate activities such communication, such as education WhatsApp groups, district WhatsApp group and subject WhatsApp groups from there the communication is easily shared and for updates sent via emails. EdTech resources help to send messages in school even if you are overseas colleagues access the information."* In addition, **P6** responded, *"I use Edtech resources to make lesson plans, to develop annual teaching plans, for teaching and learning. They used to communicate, like sending messages when there is spelling bee, and searching for words in Google as well as how to pronounce words and."* Further to this, **P7** declared that *"I use EdTech resources for monitoring the number of tasks done by supervisees."* Furthermore, **P9** concurs with **P12** by boldly responding to this question by saying that, *"I use EdTech resources to host and facilitate staff meetings. They assist me to monitor staff meetings by ensuring that participants are discussing relevant issues and be able to close the meetings especially when we are using Zoom or WhatsApp, and I use EdTech resources to network with my colleagues from other schools at any time."* However, **P11** declared that *"with my school management team, we EdTech resources to hold virtual meetings."*

Furthermore, from the data generated from the participants, I can deduce that school managers are more interested in using EdTech supervision aids to implement school managers-based activities. This suggests that school managers prioritise activities based on their role as school managers over other activities.

#### **6.3.3.6 Supervisees-based activities**

**P1** responded that, *“I use EdTech resources to download questionnaires for supervisees self-development, and I sent questionnaires to supervisees so that they respond to questions.”* In addition, **P9** avers that, *“I use EdTech resources to save time and do things simultaneously. For instance, attending meeting while eating the lunch.”*

According to the data generated from the participants, I can deduce that school managers were unaware of the activities that should be addressed by the influence of attitude perception during the curriculum supervision process. Moreover, two out of the sixteen participants' responses suggest that school managers are underprepared for the tasks that can spark the use of technological pedagogical knowledge during curriculum supervision using EdTech supervision aids like self-evaluation during quality management system using a laptop to capture and calculate scores. Simply, school managers are overlooking the policy as Marishane (2016, p. 10) on the Policy on the South African Standard for Principalship, as it articulates that the school manager needs the knowledge of managing and advocating extra-mural activities.

#### **Theme 6: Discussion**

According to Van den Akker et al. (2010), the primary goal of the activities taking place on the school grounds is to give supervisees the knowledge, skills, and attitudes/values required for curriculum supervision. In addition, school managers are required to perform curriculum-supervision activities, while using various EdTech supervision aids to supervise the curriculum. Likewise, the three levels of activities that can influence any curriculum supervision are known to the school managers. Findings, however, highlight that school managers prefer to supervise curriculum using EdTech supervision aids primarily on content-based activities instead of manager-based and supervisee-based activities. For instance, **P14**

replied, *“I use EdTech resources to analyse results in the parents’ meeting with an aid of laptop and PowerPoint term per term.”* Simply, school managers are influenced by content knowledge at the expense of pedagogical knowledge and technological knowledge. For instance, the school managers openly admit that they favour supervising a content-based curriculum because they want to teach their topics while analysing results for the Department and the parents. If school managers feel that their own actions and those of the supervisees are insignificant throughout the curriculum supervision process, this mindset/perception could be harmful to the quality of the curriculum supervision. As a result, there is an imbalance in the usage of EdTech supervision aids when carrying out activities. Thus, this study therefore promotes the equitable utilisation of all levels of perception in the execution of activities. Furthermore, Tshimanika et al. (2022, p. 09) on White Paper 7, advocates the use of ICTs as a core feature of innovations and competitiveness. Similarly, Joshua (2007, pp. C-64), on policy handbook for educators, asserts that school managers should give proper instructions and guidelines for timetabling admission and placement of learners. Likewise, Marishane (2016, p. 11), on Policy on the South African Standard for Principalship, declares that the school manager is required to recognise good instructional practices that motivate and increase learner achievement, and encourage supervisees to implement these practices. In conclusion, the school managers prioritise activities that are content-based over those that are manager- and supervisee-based. As a result, the use of EdTech supervision aids compromises the curriculum supervision process.

### **Theme 7 Responsibilities (organiser, facilitator & leader)**

When employing EdTech supervision aids to supervise curriculum, participants work with varied responsibilities. According to the data gathered, school managers tend to be aware of their responsibilities while utilising EdTech aids to supervise curriculum.

#### **6.3.3.7 School Manager as an organiser in curriculum supervision**

**P1** asserted that, *“I monitor the educators’ work and learners’ work and evaluate their work.”* **P2** added, *“My role as a supervisor is to conduct assessment with an aid of EdTech resources. After assessment I analyse the results to check the percentage achieved by learners. Moreover, EdTech resources help me to compare result for different terms in terms of achievements and to take the informed decisions.”* Further to this, **P5** responded, *“My role is to motivate and*

*encourage teachers to use EdTech resources for teaching and learning.*” In addition, **P10** stated that, *“My role as curriculum supervisor is to appraise supervisees during quality management process. I use EdTech resources to monitor teaching and learning.”* Additionally, **P11, P12, P14, and P16** responded with a similar sentiment, *“EdTech resources help me to drive staff meetings, I allow supervisees to have an input during meeting. I give them the agenda for the meeting and allow them to make additions and amendments for the agenda.”*

Moreover, the participants’ responses are in line with the literature. For instance, Bhayangkara et al. (2020) claim that the principal’s work as an organiser includes organisational design and development. The later studies further assert that it includes instructional leadership and the development of learning opportunities for learners and supervisees. In addition, it includes change management; moving an organisation (school) from where it is to where it needs to be. Thus, the responses from the participants suggest that school managers become organisers during the curriculum supervision process.

#### **6.3.3.8 A school manager as a facilitator in curriculum supervision**

**P4** *“My role to play when using Edtech resources is to ensure that accuracy is observed before I do submissions. As a result, if I do submit incorrect data, can mean I am failing to supervise curriculum. Thus, to supervise curriculum you need to be accurate, and I act as a mediator as I make sure that every learner is treated fairly in terms of progression by taking into consideration the requirement for progression assisted by updated SASAMS software in a laptop.”* In addition, **P8** responded that, *“I use EdTech resources to communicate/liaise with supervisees and prepare both learners and supervisees for future.”*

Additionally, the responses from the participants reveal that two participants out of sixteen are driven by skill perception and technological knowledge to perform the taught curriculum. Moreover, the data gathered from the participants reveal that very few school managers can see the significance of acting as facilitators during curriculum supervision using EdTech supervision aids. This demonstrates that while using EdTech supervision aids, school managers are unaware of what they are doing to jeopardise the curriculum supervision process which could compromise the outcomes of curriculum supervision.

### **6.3.3.9 A school manager as leader in curriculum supervision**

**P3** responded to a question by asserting that, *“Edtech resources help me to initiate tasks such as inviting colleagues to a get together and make a follow up whether they did receive it because the EdTech resources do indicate, and I see the response through feedback.”*

From the above school managers’ responses, I can deduce that school managers are not interested in the influence of attitude perception and pedagogical knowledge to perform the hidden curriculum during the curriculum supervision process. This might be deduced from a single participant's response to the question, as opposed to other participants' inability to do so. This may lead to infringement of policy as Joshua (2007, pp. A-48) policy handbook for educators articulates that a school manager is expected to practice and promote a critical, committed, and ethical attitude towards developing a sense of respect and responsibility towards others and develop a supportive and empowering environment for the supervisees and respond to the educational and other needs of learners and fellow supervisees.

### **Theme 7: Discussion**

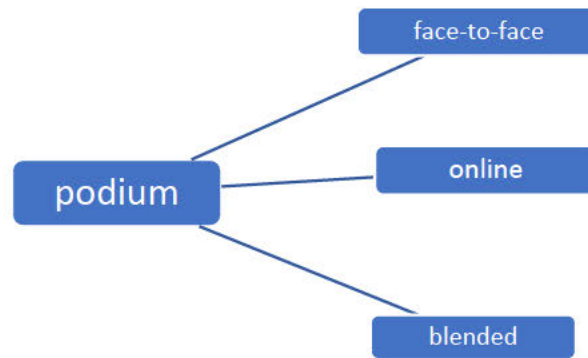
The qualitative design conducted by Chan et al. (2022) in Georgia, the purpose of this study is to investigate the perceptions of the school managers (principals) concerning the development, organisation, implementation, and evaluation of school curriculum relating to their roles as curriculum leaders in high school, middle school, and elementary school levels. The study's conclusions indicate that the perceptions of school managers are presented in the following order of the research sub-questions: The school managers’ (principals’) role in developing the curriculum is to check that the curriculum content covers all subject areas required for programme completion; principals’ role in organising the curriculum is to support head teachers in scheduling, pacing, matrix, mapping, and assessment issues of curriculum implementation and school organisation (includes revising the curriculum areas for vertical and horizontal alignment to meet learners' needs); principals’ role in involving the community in curriculum issues, principals are devoted to promoting school and community relationships; principals’ role in supporting faculty, they have made it clear that they support the faculty by making themselves accessible in responding to faculty requests. Additionally, the school manager supervises the curriculum using EdTech supervision aids over a predetermined period

and covers the required topic matter. Since the course of instruction covered in the subject, is documented (policy handbook for educators, CAPS document, education prescripts, such as Policy on the South African Standard for Principalship, White Paper 7, and others), the role of the organiser in the curriculum supervision using EdTech supervision aids relies on knowledge perception (Ontong & le Grange, 2018; Venketsamy & Kinear, 2020). Similarly, Khoza and Mpungose (2018) concur with Mabuza (2018) that when a school manager plays the role of a facilitator in curriculum supervision, the actions are informed by the enacted curriculum and pedagogical knowledge: the information is only given by the school manager. However, Nene (2019) and Singh (2021) claim that the leaders' role in curriculum supervision using EdTech supervision aids relies on attitude perception because the knowledge is informed by their age, gender, esteem, passion, culture, and beliefs.

Moreover, Jimerson and Childs (2017) claim that when a school manager assumes a leadership role, their actions are guided by the curriculum as assessed/tested, as well as technological knowledge when using EdTech supervision aids to supervise curriculum, which centres the supervisees. In addition, the leadership role in curriculum supervision using EdTech supervision aids is reliant on attitude perception. Thus, school managers lead the process of curriculum supervision instead of commanding/instructing supervisees with knowledge/information (Rahmat & Chanunan, 2018; Tanase & Dinsmore, 2023). Simply, being a leader affords supervisees a chance to change how they perceive curriculum supervision using EdTech supervision aids.

### **Theme 8: Podium**

In this context, the podium is a place/environment used by the school managers when supervising curriculum using EdTech supervision aids. Further to this, the participants were expected to share their perceptions in reference to face-to-face, online, and blended podiums as illustrated below in Figure 6.10.



**Figure 6.10 Levels of podium in curriculum supervision**

## **Theme 8 Data presentation**

### **6.3.4.0 Curriculum supervision on face-to-face**

**P12** replied, *“I use face-to-face platforms to conduct meetings.”* In addition, **P13** and **P14** shared similar sentiments as they indicated that, *“I use EdTech resources to take minutes and present slides during the staff meeting attended by supervisees in person.”* Similarly, **P15** replied, *“make presentation using laptop and printer for handout in a staff meeting.”* Likewise, **P16** responded, *“I show supervisees the videos for teaching mathematics during developmental sessions.”*

The above generated data indicates that the participants are not interested in using a face-to-face podium to supervise the written curriculum drawing from the content knowledge. However, a few participants prefer to use EdTech supervision aids in the workplace to generate possibilities for physical engagement and to provide clarification to individuals who face challenges with curriculum supervision. Furthermore, **P16** argues that physically demonstrating knowledge allows supervisees to master it fast and effortlessly.

### **6.3.4.1 Curriculum supervision on online**

**P2** asserted that, *“I use WhatsApp to invite colleagues and to prepare the meeting even after school.”* In addition, **P4** replied, *“If I am driving, I stop the car respond to a call/WhatsApp and respond to that call from circuit office/district.”* Further to this, **P5** added, *“Sometimes, I do send some information required by departmental officials via email.”* Similarly, **P12** declared that, *“Sometimes I send the minutes to the colleagues who were not in to see what was discussed in the meeting via WhatsApp.”* Likewise, **P13** averred that, *“I use WhatsApp to check what are the documents sent by the department and download them for curriculum supervision. If I see that my colleagues are not online, I just call them if it is a matter of emergency.”* Finally, **P15** responded, *“I write invitation letters to invite parents for a meeting and send them via WhatsApp and I use overhead projector to present the results.”*

Additionally, the data obtained from the participants indicates that the participants are influenced by skill perception and technology knowledge to supervise the recommended curriculum, which focuses on the skill sets and EdTech supervision aids to be prioritised by the school manager in the school podium. Furthermore, the data produced from the participants revealed that curriculum supervision using EdTech supervision aids can also take place online since the CAPS document is mute about the podium. However, Tshimanika et al. (2022, p. 16), on White Paper 7, declares that e-learning/curriculum supervision is flexible learning/curriculum supervision using EdTech supervision aids and applications, focussing on the interaction among supervisees, school managers and the online podium/environment. Similarly, Abrahams and Burke (2022, p. 15) on the Implementation Programme Guide For The National Digital And Future Skills Strategy Of South Africa 2021-2025 accentuate that functional computer access is a key required investment in special needs schools, and that technologies in the reality-virtuality continuum, which includes augmented reality and virtual reality, should be adopted as valuable EdTech supervision aids for curriculum supervision and future skills in special needs schools. This suggests that curriculum supervision using EdTech supervision aids can take place virtually as CAPS, Policy Handbook for Educators, as well as Policy on the South African Standard for Principalship, are silent about online podium.

#### **6.3.4.2 Curriculum supervision on blended podium**

**P12** responded, *“I use WhatsApp and face-to-face platforms to conduct meetings. Sometimes I send the minutes to the colleagues who were not in to see what was discussed in the meeting via WhatsApp.”*

Furthermore, the participant data demonstrates that school managers are not keen in using both a face-to-face and an online podium to supervise curriculum. The fact that only one out of sixteen school managers use a blended podium to supervise the curriculum is proof of this. However, CAPS and other Department of Basic Education documents make no mention of blended curriculum supervision using EdTech supervision aids. This argues that because there is just one podium utilised to supervise curriculum, the scope of the curriculum that needs to be supervised cannot be accelerated on time.

### **Theme 8: Discussion**

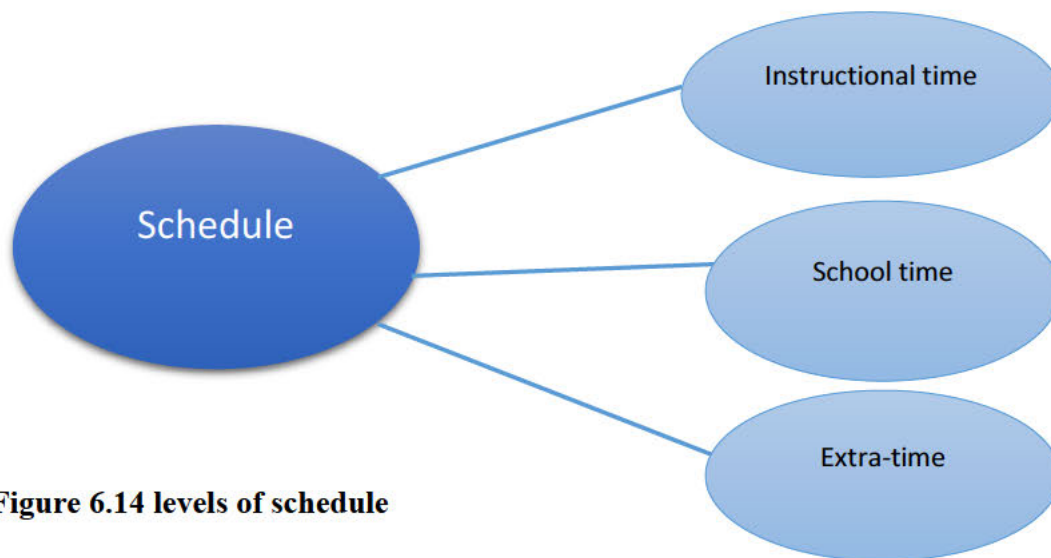
Furthermore, most school managers shared a similar view of the use of podiums in curriculum supervision using EdTech supervision aids, as they could use it both inside and outside of the school or workplace during the day and after hours provided there is a network connection. Furthermore, the recognition of these places that are beneficial for curriculum supervision indicates that participants comprehend their connection with various cites (knowledge perception), office/closed (attitude perception), and home/open/anywhere (skill perception). As a result, the curriculum supervision podium is interconnected with everything. Moreover, department of basic education White Paper 7 underscores the importance of the use of EdTech supervision aids as they improve online assessment since it has the potential to increase participation by overcoming barriers such as location/podium, time, and cost, through “on-demand assessment” (Tshimanika et al., 2022, p. 21). Data generated indicates that school managers are drawing from skill perception when supervising the curriculum using EdTech supervision aids.

In addition, the qualitative study conducted by Vaiz et al. (2021) in Cyprus, the purpose of the study is to examine the concept of supervision in the distance education process and the emerging e-supervision concept. The findings of the study reveal that the advantages of distance education provide opportunities for e-supervision to facilitate control, eliminate time and place concepts, and create an easier communication network between supervisors, supervisees, and school managers. Furthermore, the curriculum's horizontal side functions as the guide for this kind of curriculum supervision. Thus, school managers are driven by skill perception and technology knowledge. For instance, a school manager can communicate with supervisees through WhatsApp, emails, and Telegram to share and brainstorm ideas (Alias et

al., 2020). As a result, Mpungose (2020c) and Nene (2019) underscore the need for school managers to use attitude perception and technology knowledge while using EdTech supervision aids to supervise curriculum. Moreover, Gjestvang et al. (2021) and Owens and Efros (2018) silhouette that blended supervision is the mixture of conventional supervision with online supervision when supervising curriculum using EdTech supervision aids. Further to this, for this kind of curriculum supervision, school managers should be inspired by attitude perception. Thus, school managers are expected to use their pedagogical knowledge to supervise curriculum. Thus, school managers are inspired by the diagonal side of the curriculum using EdTech supervision aids utilising face-to-face and online podiums.

### **Theme 9: Schedule (Time)**

Furthermore, the concept of schedule seeks to answer the question of when curriculum supervision with EdTech supervision aids can take place (Mlaba, 2020; Zuma, 2019b). In addition, in this study schedule can be used as instructional time, school time, and extra time. Time is a valuable and scarce resource that must be managed and controlled (De Massis et al., 2018; Menon, 2015). Further to this, instructional time is defined as all the time school managers and supervisees use for the purpose of attaining curriculum goals (Jonyo & Jonyo, 2019; Mlaba, 2020). This term includes break times, extracurricular activities, sporting activities, and assessment times. In addition, it was expected that knowledge perception (instrumental time), skill perception (school time), or attitude perception (extra time) would influence how school managers perceive while they are supervising curriculum. Moreover, see the podium as illustrated below in Figure 6.14.



**Figure 6.14 levels of schedule**

### 6.3.4.3 Curriculum supervision during instrumental schedule

Furthermore, the participants responded to the question:

**P1** responded, *“To be specific, I usually collect files on Mondays and Thursdays in the morning.”* Further to this, **P2** added, *“I also use it in the morning to motivate educators to prepare themselves for the work of the day expected from them.”* Similarly, **P3** asserted that, *“the use EdTech resources has no time frame because the issue of curriculum supervision is 24/7 thing and is across the clock.”* In addition, **P9** declared that, *“we normally do our submissions on Friday and meet to discuss some of the issues (face-to-face), I use it at any time during school hours and even after school hours”*). Moreover, **P12** and **P16** shared similar sentiments that, *“I use EdTech resources during school hours.”* Furthermore, **P13** avers that *“as a school manager, I have a personal timetable which allocated me one hour to engage myself with WhatsApp to check what are the documents sent by the department and download them for curriculum supervision.”*

According to the data generated from the participants, I can deduce that the school managers use EdTech supervision aids at any time. Additionally, schedule and podium questions were addressed similarly, confirming that school managers are not time-constrained as **P3** asserted,

*“the use EdTech resources has no time frame because the issue of curriculum supervision is 24/7 thing and is across the clock.”* In addition, when understanding the schedule, instrumental time was considered, which is related to knowledge perception. This suggests that school managers are inspired by knowledge perception and have face-to-face podium interaction with their supervisees. Additionally, they use indirect podiums to supervise curriculum using EdTech supervision aids that are powered by knowledge perception and allow them to have indirect contact with the supervisees. As a result, they keep an eye on the curriculum even when they are not at the school. Similarly, **P3** states that, *“the use EdTech resources has no time frame.”* As a result, curriculum supervision is driven by knowledge perception and skill perception when supervising curriculum using EdTech supervision aids.

#### **6.3.4.4 Curriculum supervision during school schedule**

**P4** responded that, *“EdTech resources are flexible I use it wherever, when I am on lunch.”* In addition, **P5**, **P6**, and **P9** shared the same sentiments by declaring that, *“they use EdTech resources at school during working hours.”*

Additionally, from the school managers' responses, I deduced that the school managers were driven by skill perceptions and the technology knowledge to achieve the outcomes of the horizontal curriculum. Moreover, school managers were clear that curriculum supervision using EdTech supervision aids has no fixed time, as **P4** indicated that, *“EdTech resources are flexible I use it wherever, when I am on lunch.”* In other words, curriculum supervision using EdTech supervision aids can be done concurrently with other activities.

#### **6.3.4.5 Curriculum Supervision during extra-time**

Moreover, **P3** replied that, *“to use of EdTech resources for me is an advantage because it does not limit me to the office as I open a file at any time to see or if I forgotten a certain book, I just open my laptop and search that information I am looking for. Further to this, if there is any emergency to communicate even at night, I just use my EdTech resources and communicate that issue with an aid of EdTech resources.”* Further to this, **P8** added that, *“I use EdTech resources at any time even during afterhours.”* Similarly, **P9** responded that, *“most of the time I use edtech resources afternoon to remind colleagues about the meeting and provide them with the agenda to prepare themselves for the next day meeting.”* Furthermore, **P10** added that,

*“normally, we use WhatsApp to communicate with the supervisees when they are off the school. Moreover, if there is any urgent information comes, I push it through WhatsApp.”* Likewise, **P11** asserted that, *“usually, I use Edtech resource at home because at school we do not hold virtual meetings at school.”* Moreover, **P12** and **P16** shared similar sentiments as they expressed that *“I use EdTech resources during afterhours.”*

Regarding the above responses, school managers prefer to use EdTech supervision aids after hours. Additionally, participants who used the EdTech supervision aids revealed that school managers occasionally used their own resources (cell phones, internet) and unpaid time to supervise curriculum, particularly when they are from school premises. This suggests that school managers are driven by attitude perception when supervising curriculum using EdTech supervision aids. Thus, this was a sign of curriculum transformation/new knowledge gained by school managers apropos of curriculum supervision. In other words, this addresses their needs apropos of self-identities, beliefs, culture, and age. Similarly, school managers were inspired by pedagogical knowledge to enact the pragmatic curriculum.

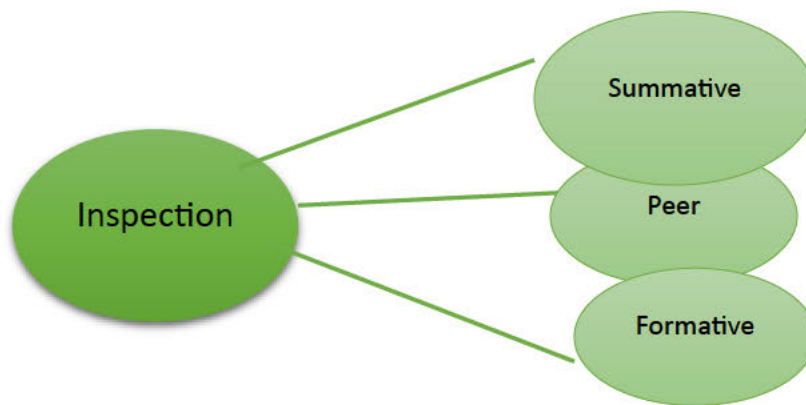
### **Theme 9: Discussion**

Curriculum supervision using EdTech supervision aids can take place anytime (Chen et al., 2017; Ogundele et al., 2019; Soelistono, 2023). Further to this, the CAPS document is silent about the time allocated for curriculum supervision. However, Joshua (2007, pp. A-32) on Policy Handbook for Educators that all school managers should be at school during the formal school day, which should not be less than seven (7) hours per day from Monday to Friday, except for special reasons and with prior permission of the supervisor concerned. In addition, the participant data revealed that the school managers relied on knowledge perception as the predominant frame of reference apropos of curriculum supervision using EdTech supervision aids. This suggests that school managers are driven by content knowledge to enact the written/vertical curriculum. In other words, the skill and attitude perceptions are compromised during curriculum supervision using EdTech supervision aids.

### **Theme 10: Inspection**

According to Phillips and Johnson (2022), inspection could be thought of as activities occurring that are expected to direct curriculum supervision towards the intended goals. Further to this,

inspection takes place in the form of summative inspection, peer inspection, and formative inspection for curriculum supervision (Kibble, 2017). Similarly, Lal and Jonathan (2023) argue that summative inspection provides a comprehensive view of the supervisee's progress at any given time. The formative inspection assists and monitors curriculum supervision. The peer inspection is a combination of both summative and formative inspection (Mogali et al., 2020). Moreover, the data generated from the participants is presented as follows in Figure 6.18 below:



**Figure 6.18 Levels of inspection**

#### **6.3.4.6 Summative inspection on curriculum supervision**

Furthermore, summative inspection is matched with knowledge perception in this study since it assesses the course of instruction to grade the supervisees at a given moment. Further to this, the participants provided the following responses as indicated below:

**P2** responded that *“when conducting the quality management system (QMS), we hold the meeting and take minutes using a laptop, for record keeping. I use EdTech resources to record scores achieved by individuals.”* Similarly, **P3** added *“I give supervisees a departmental questionnaire and award scores then the scores are recorded and kept on the laptop.”* Likewise, **P4** asserted that *“I use the overhead projector to conduct advocacy to the colleagues during the process of quality management system. I use EdTech resources to compile the educators’ scores during summative inspection (quality management system). Moreover, I use a laptop to calculate the scores, as it calculates itself. Furthermore, I develop my colleagues on how to assess each other during the quality management system process, and to calculate scores using*

*laptop and how to analyse scores with an aid of a laptop since, quality management system involves School Development Team (SDT)."* In addition, **P6**, **P7**, and **P8** expressed similar sentiments, *"I use EdTech resources to set and ask questions during summative evaluation."* Additionally, **P10** asserted that, *"I do quality management system in different ways sometimes, we an announced and unannounced class visits to make sure that everything is in good order. I evaluate them about their teaching skills and their competency for the purpose of development."*

The data generated from the participants suggests that the school managers are aware of the hardware and ideological resources/supervision aids used during the summative inspection. In addition, hardware resources/supervision aids refer to any type of machine, tool, or resource used to enhance curriculum supervision (Khoza, 2013, 2016a; Mathunjwa, 2019). *I use a laptop to calculate the scores, as it calculates itself. Furthermore, I develop my colleagues on how to assess each other during the quality management system process, and to calculate scores using laptop and how to analyse scores with an aid of a laptop since, quality management system involves School Development Team (SDT)."* Likewise, school managers realise that supervisees' performance needs to be evaluated/inspected to decide whether they are eligible for pay progression and whether they require professional development relevant to the course of instruction as a goal for intended curriculum and curriculum supervision. Similarly, the use of supervision aids for the course of instruction and summative inspection relates to knowledge perception; the use of supervision aids relates to skill perception and for curriculum supervision as attitude perception. This is because the course of instruction and inspection form part of perspectives during curriculum supervision. In addition, the use of EdTech supervision aids in summative inspection, as a process, fast-tracks communication between school managers and supervisees. As a result, curriculum supervision is regarded as attitude perception, thus a school manager decides how to use these EdTech supervisor aids to supervise the course of instruction and inspect supervisees. Moreover, school managers consider three levels of perceptions, although perception is summative which links well with knowledge perception. Thus, school managers need to understand that they must conduct inspection tasks which can assist them to improve their practices during the curriculum supervision process when using EdTech supervision aids (Eslit, 2023; Pearson & Mitroff, 2019).

#### **6.5.4.7 Peer inspection on curriculum supervision**

Peer inspection is an inspection, by colleagues/peers of all curriculum supervision-related activities for either formative (for developmental) or personal decision outcomes (Hinshaw, 2020). Moreover, during the semi-structured interviews, the participants answered the questions as follows.

**P1** responded, *“Sometimes, we ask supervisees to assess each other.”* In addition, **P4** added that, *“I develop my colleagues on how to assess each other during the quality management system process, and to calculate scores using laptop and how to analyse scores with an aid of a laptop since, quality management system involves School Development Team (SDT).”* Further to this, **P10** added that, *“supervisees assess each other and provide developmental sessions with their school developmental team.”* Similarly, **P11** asserted that, *“I allow supervisees to assess each other guided by policy manual.”* Likewise, **P13** declared that *“supervisees evaluate themselves since it is required by the department.”* Furthermore, **P16** stated that *“supervisees are also requested to evaluation by being evaluated by their peers as well as by their supervisors.”*

Moreover, the data generated from participants revealed that some school managers are aware of the peer inspection to be conducted in schools for the school development team. In respect of the above, the school development team is responsible for developing strategies to support the development of appraisal systems at schools (Bryant, 2019). Further to this, they are the vehicle by which supervisees and school managers are given the responsibility to work together to promote continuous improvement in supervisees’ performance (Apolot et al., 2018). In addition, the findings revealed that most school managers lack enthusiasm for encouraging peer inspection in schools. However, Bacoup et al. (2018, p. 6) on the Quality Management System (QMS) Manual that school managers should ensure that the appraisal of all supervisees is included in the supervision plan of the school, and have overall responsibility of supervising the planning and implementation of QMS processes.

#### **6.5.4.8 Formative inspection on curriculum supervision**

Furthermore, formative inspection on curriculum supervision provides in-process feedback about what supervisees are or are not supervising; permitting instructional approaches, curriculum supervision materials, and academic support to be tailored to the needs of the supervisees (Parker, 2019). According to the data generated from the participants:

Both **P1** and **P16** responded that, “*Sometimes, I ask supervisees to conduct their self-evaluation.*” In addition, **P5** and **P8** shared similar sentiments that “*I assess teachers through unannounced class visits.*” Similarly, **P7** replied that, “*during half yearly assessment I conduct formative (self-evaluation) assessments using the laptop to type documents.*”

From the school managers' responses, I deduced that most school managers are not conversant with the significance of formative inspection in curriculum supervision. However, Yildirim (2022) claims that self-inspection helps school managers to create critical reflective practices in their own actions. Further to this, it strengthens school managers' own responsibility over their work and increases control and ownership of their own professional development. Furthermore, Musundire (2015, p. 2) articulates on Integrated Quality Management System Manual for school-based educators that school managers should ensure school self-evaluation/inspection is done in terms of the Whole School Evaluation (SWE) policy and in collaboration with the School Development Team (SDT). This suggests that the school managers are compromising the curriculum supervision by failing to implement the Department of Basic Education policy.

### **Theme 10: Discussion**

The qualitative study conducted by Mamabolo et al. (2022) in South Africa, the study reported to evaluate the roles of school managers in the implementation of the Integrated Quality Management System (IQMS) in South African schools. The findings of the study reveal that there was no proper implementation of the IQMS in schools. In addition, supervisees conducted IQMS for monetary rewards instead of quality assurance. Further to this, the findings concluded that the roles and responsibilities of school managers are crucial during the implementation of IQMS in schools. This suggests that school managers are missing continuous training for the importance of both peer and self-inspection (formative inspection), since school managers are driven by only knowledge perception at the expense of both skill and attitude perception. In other words, school managers draw from the course of instruction since it is at the centre of curriculum supervision when using EdTech curriculum aids. In addition, most school managers are driven by vertical/performance curriculum in which their core duties are central to curriculum supervision, the focus is on professional development. This is evident from **P4**, “*I use the overhead projector to conduct advocacy to the colleagues*

*during the process of quality management system. I use EdTech resources to compile the educators' scores during summative inspection (quality management system).*” Moreover, some school managers were driven by skill perception which is aligned with the horizontal/competence curriculum. Furthermore, a minority of school managers did not consider the element/level of formative inspection that is influenced by attitude perception. This suggests that the inspection during curriculum supervision using EdTech supervision aids is unbalanced, compromising the process.

## **6.6 Summary**

This chapter discussed ten curriculum pillars/components (justification, EdTech supervision aids, course of instruction, approachability, responsibility, desires, matter, schedule, podium, and inspection). In addition, reflective activities, focus group discussions, and one-on-one semi-structured interviews revealed that school managers were unclear on other curriculum pillars/components because gaps were detected throughout the data-generating process.

## **CHAPTER SEVEN**

### **A SYNOPSIS OF THE RESULTS, SUMMARY, AND SUGGESTIONS**

#### **7.1 Introduction**

In the preceding chapter, data was presented diligently utilising curriculum standards to frame discussions. Data for analysis was generated from the reflective activities, focus groups, and

one-on-one semi-structured interviews. The emphasis of this chapter is on theorising school managers' perceptions, which were provided systematically in the previous chapter. Moreover, the aim is to address the purpose of this study: to explore the school managers' perceptions of the use of EdTech resources to supervise curriculum in the context of COVID-19. These three important research questions, as listed below, have influenced the purpose:

1. What are school managers' perceptions of the use of technological resources to supervise curriculum?
2. How do school managers perceive the use of technological resources when supervising curriculum?
3. Why do school managers perceive the use of technological resources when supervising curriculum in the manner that they do?

Additionally, in attempting to address these questions, the researcher employed an interpretive paradigm. To get results, this study needed to engage in a systematic review of the appropriate literature to situate the phenomenon of this study within an existing body of research to close a gap in the literature. This is considerably helpful when classifying perceptions into three categories: knowledge, skill, and attitude perceptions. As a result, the study's questions and objectives have been addressed by employing the findings reported in the preceding chapter. Moreover, this chapter additionally offers recommendations that might be useful to school managers and the Department of Basic Education curriculum designers.

I offer a summary of the ten themes that emerged as constructs to redirect perceptions, suggest consequences, and outline the inputs made by this study on school managers' perceptions by considering the data obtained in Chapter Six and integrating these data with research questions. As a reminder, the ten themes are: EdTech supervision aids, justification, course of instruction, approachability, desires, matter, responsibility, podium, schedule, and inspection.

The perceptions of school managers are redirected making use of theory. As a result, I conclude my ideas on exploring/redirecting school managers to supervise curriculum using EdTech supervision aids by providing the implications of this study's findings and recommendations.

## **7.2 Summary of Findings and Recommendations**

### **7.2.1 Theme One: EdTech Supervision Aids**

Findings from semi-structured interviews discovered that school managers are proficient with hardware EdTech supervision aids such as laptops, smartphones, tablets, and whiteboards during curriculum supervision. Conversely, findings from the reflective activity confirm school managers as not being competent at, and even suffering from, software EdTech supervision aids such as Zoom meetings, Team Meetings, Facebook, and Skype, because they have not been capacitated to use these programmes. School managers, for example, cannot create Zoom meetings despite having computers and access to the software. Furthermore, participants exhibited insufficient comprehension of ideological EdTech supervision aids, such as the Socratic method, that can be used to supervise curriculum. As a result, these data illustrate that knowledge and skill levels of perception are more prevalent during the curriculum supervision process, while attitude perception is less dominant. Moreover, when supervising curriculum in schools, school managers focus more on content knowledge and technology knowledge and less on pedagogical knowledge. The above suggests that school managers rely on content knowledge and less on technology and pedagogical knowledge when justifying their supervision of curriculum using EdTech supervision aids. As a result, this study recommends that curriculum developers work alongside ICT team specialists to advocate paperless curriculum supervision, and to train and enhance school managers on software and ideological-ware EdTech supervision aids. Moreover, the study suggests that the Department of Basic Education expedite the installation of Wi-Fi for connectivity in all schools. This can help school managers during uncommon situations. Furthermore, curriculum developers should be provided time (six months) to amend and review policy documents and curriculum supervision guides.

### **7.2.3 Justification for Using EdTech Supervision Aids**

During the data generation process, it became clear that school managers using EdTech supervision aids to supervise curriculum are inspired by knowledge justification/rationale. For instance, participants disclosed that they are influenced by Department of Basic Education policies when using EdTech supervision aids to perform administration and work organisation. Additionally, EdTech supervision aids are introduced to school managers, who firmly believe that these EdTech supervision aids may speed up the curriculum supervision process. Conversely, school managers find it difficult to justify their attitude

rationale/justification when it comes to curriculum supervision. It's evident that most school managers don't know how to use EdTech supervision aids for interacting with other department officials, parents, and supervisees during curriculum supervision. Additionally, the findings of the semi-structured interviews proved that school managers only partially comprehend the skill justification behind the use of EdTech supervision aids for curriculum supervision. According to study findings, school managers do not use their EdTech skills acquired in universities in the curriculum supervision process. As a result, most school managers lacked the expertise necessary to use EdTech supervision aids to supervise curriculum in an equitable/balanced manner. Additionally, Figure 7.2 below illustrates the unbalanced justification provided by the findings for school managers to use EdTech supervision aids during curriculum supervision. The above suggests that school managers rely on content knowledge and less on technology and pedagogical knowledge. This study thus recommends the Department of Basic Education provide capacitation for school managers on how to supervise curriculum using EdTech supervision aids to enhance their expertise and professionalism. In addition, the capacitation/training should focus on the 4<sup>th</sup> industrial revolution, such as Zoom meetings, Skype meetings, WhatsApp chat groups and Telegram chat groups. Additionally, the Department of Basic Education should partner with parents and guardians to inform and prepare them for the significance of utilising modern tools.

#### **7.2.4 Course of Instruction**

The results reveal that during curriculum supervision, school managers are aware of every category of course instruction which is a component of primarily knowledge perception. In addition, the data from the participants revealed that school managers do understand that curriculum supervision can be supervised using EdTech supervision aids. School managers expressed confidence in the usefulness of EdTech supervision aids for curriculum supervision during one-on-one semi-structured interviews. They stated that they used them to supervise the implementation of teaching and learning, primarily focusing on the curriculum's prescribed guidelines, such as the ATP (Annual Teaching Plan) and CAPS document. These results also suggest that school managers are aware of the value of utilising EdTech supervising aids for curriculum supervision. For instance, they use it to monitor the achievements of the learners by using the tracking tools and reporting to both parents and department. Few school managers indicate that they use it to download questionnaires for supervisees for self-development in all aspects of life such as sports activities. Consequently, perceptions at all levels influence school

managers differently. Similarly, while using EdTech supervision aids to supervise curriculum, school managers are inspired differently depending on how they perceive EdTech supervision aids. The imbalanced course of instruction during curriculum supervision using EdTech supervision aids is depicted in Figure 7.3 below.

#### **7.2.4 Approachability**

Based on the data, it is apparent that financial approachability, which is driven by knowledge perception, is the most prevalent category of approachability. For example, school managers stated that they used laptops, tablets, desktop computers, and other EdTech supervision aids obtained from the Department of Basic Education to meet curriculum supervision goals. However, school managers indicated that they are offended by parents' usage of social media to make rude comments rather than helpful suggestions when it comes to cultural approachability. Similarly, School managers revealed that the Department of Basic Education affords them a lot of support since it gives them access to data. Based on the findings, skill and attitude perception is subordinated to knowledge perception of curriculum supervision using EdTech supervision aids. The imbalance in approachability when using EdTech supervision aids in curriculum supervision is depicted in Figure 7.4 below. Moreover, the findings stated above indicate that when using EdTech supervision aids to supervise curriculum, school managers place greater emphasis on content knowledge and less on technology and pedagogical knowledge. Thus, this study recommends that the Department of Basic Education should conduct workshops online instead of in-person to provide school managers with more technology and pedagogical expertise. Furthermore, it is recommended that the Department of Basic Education enlighten parents and guardians on the significance of social media in the educational system, especially when it comes to curriculum supervision activities like interacting to reduce absences among pupils and make profitable use of it.

#### **7.2.5 Desires**

The findings reflect that during the curriculum supervision process, school managers are aware of every category of desires (goals). Furthermore, the participant data disclosed that school managers are aware that the Department of Basic Education's plan to supervise curriculum using EdTech supervision aids is intended to help them establish and uphold positive habits

that can allow them to better align their practices with the demands of the fourth industrial revolution. Likewise, school managers claimed that they intended to persuade supervisees to be proficient in technology throughout the curriculum supervision process. Moreover, during one-on-one semi-structured interviews, participants exhibited that their objective of using Edtech supervision aids was to achieve excellence in their teaching and learning. Similarly, school managers further demonstrated that their outcomes were to communicate effectively with the supervisees. This is aligned with the Revised Five-Year Plan Strategic Plan which states that the school managers are responsible for implementation of ICT in schools. For instance, school managers mentioned that their intended outcomes include fast tracking messages to the parents. According to the findings, the school managers are unevenly inspired by all levels of knowledge domains when using EdTech supervision aid to supervise curriculum.

#### **7.2.6 Matter**

Findings proved that school managers prioritise school managers' matters, such as task moderation, to comprehend the matter into which EdTech supervision aids are used to supervise curriculum. Furthermore, school managers express a preference for societal matters because they prepare supervisees for formal matters such as continuous professional development. Similarly, school managers stated that Edtech supervision aids help them develop lesson plans. Consequently, it is critical to acknowledge the importance of school managers' matters in curriculum supervision. On the contrary, the data show that a limited proportion of school managers prefer to use EdTech supervision aids in curriculum supervision over content-based matters such as quality management systems. They prefer, instead, to use EdTech supervision aids in school manager-related matters. Furthermore, the data indicates that few school managers believe in supervisee-based matters such as preparing lesson plans during curriculum supervision. The data presented above indicates that school managers place an emphasis on skill level perception over knowledge and attitude perception. The imbalance of matters using EdTech supervision aids during curriculum supervision is depicted in Figure 7.6 below. Moreover, the findings above suggest that school managers are influenced by technological knowledge and less by content knowledge and pedagogical knowledge when supervising curriculum using EdTech supervision aids in schools. As a result, this study suggests a policy that can mandate the use of EdTech supervision aids in all school matters, impose curriculum reform in schools, and convert all schools to smart schools. Thus,

the CAPS policy document and other Department of Basic Education statutes on EdTech supervision aids must cover all available EdTech supervision aids in schools, such as tablets, laptops, smartphones, and so on, making them mandatory in curriculum supervision. Additionally, school managers should be instructed on how to use these EdTech supervision aids instruments and provided with operating manuals.

### **7.2.7 Responsibility**

The data has been analysed to better comprehend the responsibilities of school managers while supervising curricula using EdTech supervision aids. Findings reflected that school managers are conversant in their responsibility as an organiser when supervising curriculum using EdTech supervision aids. Furthermore, school managers stated that they perceive themselves as organisers since they monitor and assess the work of educators and learners. The replies of school managers are consistent with the conclusions Malumbete (2021) because school managers who supervise curriculum and place content at the centre are curriculum organisers. Similarly, when asked whether they perceive themselves as facilitators, school managers expressed discontent and perplexity. Similarly, the data generated from the participants revealed that few school managers perceive themselves as leaders during the curriculum supervision process. This suggests that school managers are driven by attitude perception which is linked to pedagogical knowledge. Furthermore, it is evident that school managers mostly draw from knowledge perception at the expense of attitude and skill perception during the curriculum supervision process. This suggests that school managers have a limited understanding of how to use technology and pedagogical knowledge during the curriculum supervision process. Thus, this study recommends that short online courses be developed to illustrate school managers' responsibilities when supervising curriculum using EdTech supervision aids.

### **7.2.8 Podiu**

During one-on-one semi-structured interviews, it emerged that school managers prefer to supervise curriculum online using EdTech supervision aids. Likewise, the findings indicated that school managers preferred to communicate via WhatsApp (online) rather than the face-to-face and blended podiums because this platform/podium is flexible. For instance, whenever one is driving a car, one can still send messages to supervisees and respond to calls from departmental authorities without physically being present. Furthermore, the findings indicate

that very few school managers understand the necessity of using EdTech supervision aids to supervise curriculum by interacting face-to-face and via blended podium, suggesting that school managers are primarily influenced by skill perception, which is linked to technology knowledge from which school managers draw. As a result, this study recommends the Department of Basic Education provide seminars that inform school managers on the necessity of communicating face-to-face and through various channels during curriculum supervision.

### **7.2.9 Schedule**

The findings were analysed to better understand the schedule used by school managers when using EdTech supervision aids to supervise curriculum. Moreover, when using EdTech supervision aids, school managers opted to use the instrumental time to supervise the curriculum. Similarly, school managers claimed that they use instrumental time to supervise curriculum using EdTech supervision aids since EdTech supervision aids allow morning to motivate supervisees to prepare themselves for the work of the day expected from them. Moreover, the school managers' responses are in line with findings from studies by (Mlaba, 2020; Mpungose, 2017) because school managers who supervise the curriculum using EdTech supervision aids are at the centre of the curriculum. Thus, school managers are driven by technology knowledge to enact the assessed/tested curriculum. However, the findings revealed that there are very few school managers who appreciate the value of using instrumental time and extra time to supervise curriculum. Instead, school managers rely on technology knowledge at the expense of content and pedagogical knowledge when supervising curriculum using EdTech supervision aids. The study consequently recommends that the Department of Basic Education arrange a session for school managers in which they draw attention to the need to supervise curriculum during extra-curricular and school time.

### **7.2.10 Inspection**

The findings revealed that the dominant level of inspection is summative inspection. The responses of school managers revealed that they use EdTech supervision aids to record supervisees' scores during the quality management system. Furthermore, the findings indicate that school managers find it hard to use EdTech supervision use to supervise curriculum into formative and peer inspection. This indicates that school managers are ill-equipped to use formative and peer inspection during curriculum supervision when EdTech supervision aids

are used. In addition, school managers experience difficulty using Microsoft Excel to determine total scores for supervisees during the process of quality management systems. The findings show that school managers believe in summative assessment as it informs the professional development sessions. Thus, when supervising curriculum with EdTech supervision aids, school managers tend to be inspired by knowledge perception. Furthermore, Figure 7.10 shows the imbalance in inspection categories when using EdTech supervision aids during curriculum supervision. As a result, the findings presented indicate that when supervising curriculum using EdTech supervision aids, school managers rely more on content knowledge and less on technology and pedagogical knowledge. As a result, this study recommends that the Department of Basic Education develop a policy that addresses the use of EdTech managing aids in the administration of all forms of school inspection.

### **7.3 Reacting to the Research Questions and Objectives**

This qualitative study was undertaken to address the three primary research questions. Furthermore, the study sought to explore school managers' perceptions of the use of EdTech supervision aids to supervise curriculum by addressing to research question of what (description), how (operation), and why (philosophy). Furthermore, this study is shaped by existing literature and data generated following the principles of the TPACK framework. This case study was undertaken to address questions using reflective activity, one-on-one semi-structured interviews, and focus groups. As a result, the following questions were answered: The initial research question (the first posed question) was **What are school managers' perceptions on the use of technological resources to supervise curriculum?** This attempted to address the first research objective: To understand school managers' perceptions of the use of technological resources to supervise the curriculum. It is evident from the literature that school managers' perceptions can be classified into three levels/categories. The first level is knowledge perception. In this category, school managers focus on their vertical curriculum, which places the demand for expertise at the core of curriculum supervision. Hence, when addressing questions, participants used standards from the curriculum propositions, which are the building blocks of knowledge perception. Similarly, these propositions are, knowledge justification, professional development, hardware EdTech supervision aids, financial approachability, objectives, content-based matter, organiser, face-to-face podium, instrumental schedule, and summative inspection. This suggests that when school managers draw from

knowledge perception, they are required to be cognisant of the latter proposition to use EdTech supervision aids effectively to supervise curriculum,

Additionally, both literature and findings showed that the second level of perception was skill perception. In this category, it became very clear that school managers are driven by this latter perception, they reflected much on their horizontal curriculum. Thus, this curriculum comprises propositions as follows: skill justification, software EdTech supervision aids, coaching, outcomes, online, school managers-based, matters, cultural approachability, school time, and peer inspection. This suggests that when school managers are driven by skill perception, they are bound to address the needs of the supervisees, indicating that they are putting the community/subordinates at the core of curriculum supervision. According to the study's findings, most school managers believe that EdTech supervision aids should be used for school manager-based matters. Therefore, whenever they conduct curriculum supervision, supervisees must come before anything else. Simply, when school managers are driven by skill perception level, they should address the needs of the society/supervisees when using the EdTech supervision aids to supervise the curriculum (Makumane & Khoza, 2020).

The third level was attitude perception. School managers focused on the pragmatic curriculum in this category. Furthermore, the following principles comprise a pragmatic curriculum: attitude justification, ideological-ware EdTech supervision aids, extra-curricular activities, physical approachability, aims, supervisee-based matter, leader, blended podium, extra-time, and formative inspection. These principles were detected in the perceptions of school managers, especially during curriculum supervision when EdTech supervision aids were used. This suggests that when school managers draw from attitude perception, they have to accommodate the individual preferences (feelings) of supervisees during the curriculum supervision process to ensure that its aims are accomplished.

In response to the first question, the study's findings reveal that school managers use a variety of EdTech supervision aids, comprised of hardware, software, and ideological-ware, during the curriculum supervision process. Furthermore, hardware EdTech supervision aids, such as tablets, laptops, whiteboards, computers, and overhead projectors, are employed to help fulfil curriculum supervision demands (Khoza, 2019c; Mpungose, 2017; Zuma, 2019b). These EdTech supervision aids are classified into two categories: i) external hardware (supervision aids tied to the main computer), such as printers, earphones, speakers, USB, and overhead projector cables); and ii) internal hardware (which must be present for the computer to

function), which comprises the hard drive and motherboard (Mpungose, 2020a; Null, 2023). Furthermore, software EdTech supervision aids are any material developed for hardware that exhibits information or communicates curriculum supervision, such as emails, application software, social media, and MS PowerPoint (Budden, 2016; Mthethwa, 2021; Sokhulu, 2021). In conclusion, ideological-ware EdTech supervision aids are strategies and theories used when cognitivism, connectivism, and behaviourism are employed for curriculum supervision when using EdTech supervision aids (Biyela, 2018; Khoza & Mpungose, 2022; Zulu, 2018). According to the findings of this study, school managers favoured hardware more than software and ideological-ware EdTech supervision aids while supervising curriculum. This indicates that while using EdTech supervision aids, school managers were influenced by knowledge perception at the expense of skill and attitude perceptions. Similarly, while supervising curriculum using EdTech supervision aids, school managers appeared to be more inspired by content knowledge compared to technological and pedagogical knowledge. Nevertheless, the study concluded that school managers supervise curriculum using EdTech supervision aids as they perceive fit. Furthermore, the policies of the Department of Basic Education are silent on the use of these EdTech supervision aids for curriculum supervision. Consequently, the curriculum supervision goals of the Department of Basic Education fail to be achieved since school managers are uninformed/misdirected by any document/policy on using EdTech supervision aids to supervise curriculum (Bocking, 2022; Potasznik, 2020). This could result in school managers using EdTech supervision aids to their full capacity while supervising curriculum.

The second question: **How do school managers perceive the use of technological resources when supervising the curriculum?** It was asked to accomplish the second research objective, which was expressed as follows: 2. To find out whether school managers feel well equipped to use technological resources to supervise curriculum. Furthermore, the findings reveal that school managers have positive feelings about their curriculum supervision when using EdTech supervision aids, and this is related to supervisees' responses. Similarly, school managers' thoughts about curriculum supervision were rooted in their determination to provide a conducive curriculum supervision podium (online) and supervision schedule (instrumental) that could enhance supervisees' performance, despite the obstacles that they perceive as threatening their curriculum supervision endeavours. Furthermore, school managers acknowledge the various distinctions that supervisees encounter among the category ranking of schools and make decisions based on their inspection of the curriculum supervision setting, the supervisees' historical and EdTech supervision aids experiences/perceptions, and supervisees' readiness to adapt, adopt, and develop their ideas accordingly. For instance, with

semi-computer literate supervisees, school managers' thoughts about their supervisees' effectiveness are based on reasonable expectations, whereas with more equipped supervisees, school managers' assumptions about their supervisees' performance are more focused on how to improve these supervisees, both of whose decisions impact their curriculum supervision exercises. Moreover, knowledge perception involves the use of EdTech supervision aids to supervise curriculum as informed by prescribed policy documents. This suggests that school managers used EdTech supervision aids by drawing from CAPS as the document guiding the implementation of the intended curriculum. Similarly, school managers applied knowledge perception when interacting with supervisees when using EdTech supervision aids, such as emails and WhatsApp. As a result, to be able to address the second research question, I needed to gather information from participants on how they perceive the use of EdTech supervision aids when supervising curriculum while impacted by knowledge perception.

In addition, from the skill perception, participants demonstrated what they have learned from various society/professional stakeholders in their seminars/workshops to utilise specific matters such as quality management systems and facilitation. Furthermore, participants explained how they interacted with departmental officials (like using emails and WhatsApp), employing their skills and technology knowledge to enhance their curriculum supervision using EdTech supervision aids. Likewise, some school managers used technology skills to enhance their use of software, such as making presentations using PowerPoint to workshop supervisees when conducting advocacy for quality management systems. As a result, school managers manage to interact with supervisees online. Likewise, school managers managed to encourage supervisees to conduct peer inspections to provide staff development. Moreover, participants could conveniently continue to use school time to coach supervisees to develop a passion for using EdTech supervision aids to supervise curriculum. Furthermore, school managers successfully facilitated the moderation of supervisee tasks to achieve the curriculum supervision outcomes. In response to the study's last question: **Why do school managers perceive the use of technological resources in supervising curriculum in the manner that they do?** This question attempted to address the following objective: To determine the challenges perceived by school managers when using technological resources to supervise curriculum. The study's findings articulated that supervisees' personalisation perceptions using EdTech supervision aids when supervising curriculum are either positively or negatively influenced by attitude perception. School managers perceive the use of EdTech supervision aids for curriculum supervision in a particular manner because of their interaction

and attitude perceptions, which influence their practises during curriculum supervision. Similarly, it was evident that school managers enjoy using EdTech supervision aids to simplify things and make supervisees feel more able to achieve the outcomes of curriculum supervision. Furthermore, school managers revealed that they appreciate formative inspection since it assists in checking supervisees' half-yearly performance to track their progress and performance. As a result, school managers perceive the use of EdTech supervision aids in specific ways due to contributing factors such as a computer illiteracy, a lack of connectivity, a scarcity of EdTech supervision aids, individual dedication, and the necessity to use hardware and software EdTech supervision aids.

#### **7.4 Dialogue on Perceptions and EdTech Supervision Aids in Use for Curriculum Supervision**

(Khoza, 2023; Mlaba, 2020; Tshabalala, 2021; Zuma, 2020) acknowledge that knowledge perception is the highest level of perception, notably when it comes to curriculum supervision using EdTech supervision aids. Furthermore, knowledge perception encourages school managers to draw from the vertical/performance curriculum during the curriculum supervision process. Their studies confirm that a vertical curriculum is mandated, and all school managers are obligated to comply with the official document (CAPS) during the curriculum supervision process. As a result, for adequate use of EdTech supervision aids in curriculum supervision, school managers should be well-equipped in advance (Omeodu et al., 2023; Ondimu, 2018). Moreover, the findings of this study also revealed the importance of the knowledge perception during curriculum supervision using EdTech supervision aids. School managers were informed by the curriculum, which contains all predetermined courses of instruction to be supervised throughout a particular term or year. As a result, if the course of known, planned, and scheduled well in advance, school managers can choose the right hardware EdTech supervision aids (tablets, laptops, smartphones, and whiteboards) to be used during curriculum supervision. Additionally, (Biggs et al., 2022; Mangal & Mangal, 2019) claim that the knowledge perception requires school managers to become organisers when using EdTech supervision aids to supervise curriculum. This is apparent from the findings that school managers have a substantial influence on the schedule of the curriculum supervision process. Similarly, marks/activity of recording (moderation of marks) is moderated in advance before being captured in a system at the end of the year. Moreover, the findings of this study demonstrated that school managers were inspired by knowledge perception during curriculum supervision using EdTech supervision aids. This indicates that the goals of the curriculum

supervision using EdTech supervision aids were successfully accomplished. (Mlaba, 2020; Nene, 2019; Zulu, 2018) asserted that in curriculum supervision, knowledge perception using EdTech supervision aids is a critical part in summative/inspection/assessment performance. In conjunction with this, findings discovered that school managers subjected supervisees to several forms of summative assessments, including quality management systems, learner assessment, and midyear assessment during the quality management system. In other words, knowledge perception seeks school managers to supervise curriculum in a competent way using EdTech supervision aids following the policy document. As a result, numerous hardware EdTech supervision aids to be used for curriculum supervision are mentioned in the CAPS policy documents and others (Policy on the South African Standards for Principalship). Moreover, knowledge perception wasn't intended as a complete item for all educational levels. When supervising curriculum using EdTech supervision aids, for example, levels of education can vary from primary schools to Technical and Vocational Education and Training Colleges and Universities (knowledge, skills, and attitude). As such, they cannot be used similarly in every scenario.

Additionally, skill perception is concerned with knowledge of technology that incorporates the use of social technological podiums (such as Facebook, Telegram, WhatsApp) in the process of curriculum supervision using EdTech supervision aids. Thus, school managers draw from a horizontal/competence curriculum (Alvunger, 2018; Khoza, 2019c; Remillard, 2018). Similarly, Yilmaz (2020) concurs with Bernad (2022) and (Mlaba, 2020) that horizontal curriculum success relies on supervisees being given informal matters based on relevant courses of instruction supervised in school. As a result, the findings of the study revealed that a competence curriculum can be attained when supervisees are assessed by their peers during the quality management system. Thus, Makumane and Khoza (2020) concur with (Mpungose, 2020b) that school managers in the horizontal curriculum are influenced by skill perceptions during curriculum supervision using EdTech supervision aids. Furthermore, school managers-based matters/activities, such as checking lesson plans for supervisees, may be carried out to satisfy the demands of the supervisees, despite the podium employed. Moreover, the findings of the study demonstrated that school managers were driven by skill perception to supervise curriculum using EdTech supervision aids. As a result, in the implementation of online curriculum, supervision is determined by the availability of technology and online curriculum supervision determine the current professional competencies of school managers (Chiu, 2023; Yikici et al., 2022). Additionally, the study's results indicated that skill perception enables

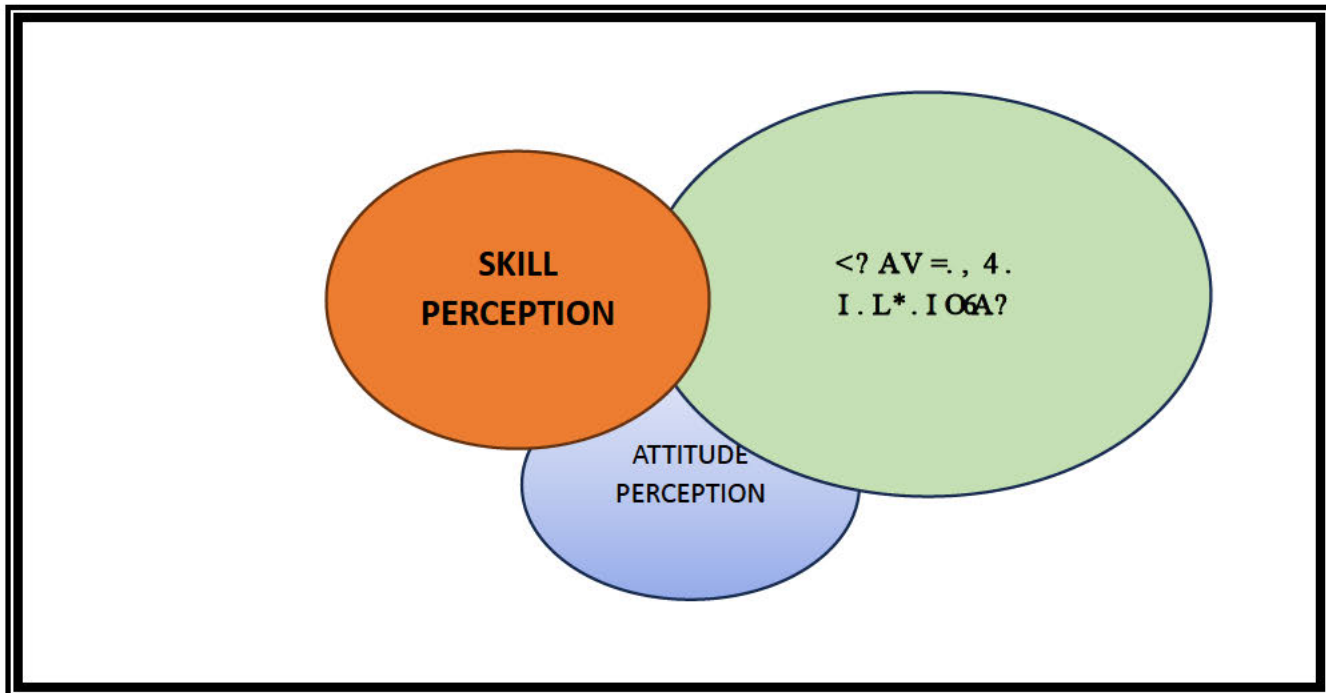
school managers to attain curriculum supervision outcomes when using EdTech supervision aids. Similarly, the study's findings demonstrated that skill perception stimulates school managers to act as facilitators during curriculum supervision when EdTech supervision aids are used. Because of the study's findings, school managers are empowered by skill perception in ensuring that software EdTech supervision aids remain significant during the curriculum supervision process to achieve curriculum supervision outcomes. Yet, when school managers use EdTech supervision aids to supervise curriculum, attitude perception performs a substantial part in ensuring that curriculum supervision aims are reached.

Moreover, attitude perception assists school managers to identify the amount of knowledge the supervisees have to attain during the process of curriculum supervision because it is driven by a pragmatic curriculum (Makumane & Khoza, 2020; Shoba & Khoza, 2022; Stoller, 2018). Likewise, Ghiat (2022) and Mohanty et al. (2022) advocate that pragmatic curriculum seeks to create a flexible, dynamic, and integrated curriculum that supports developing the supervisee and the changing society as their necessities, demands, and situations dictate. Furthermore, the study's findings indicate that a pragmatic curriculum motivates school managers to conduct formative inspections to assess their performance quality management system to further enhance their performance during curriculum supervision while using EdTech supervisory aids. Plus, a pragmatic curriculum serves a purpose in both vertical and horizontal curricula in determining supervisees' awareness of the necessity of implementing curriculum supervision during extra time using EdTech supervision aids. In other words, the pragmatic curriculum serves as a link between a vertical and a horizontal curriculum (Khoza, 2019a; Nicolaidis, 2021). Similarly, the pragmatic curriculum inspires school managers to use ideological-ware EdTech supervision aids and draw from pedagogical knowledge to ensure that curriculum supervision aims are fulfilled. Based on the findings, attitude perception necessitates school managers acting as leaders in establishing matters/activities that enable curriculum supervision to thrive. Furthermore, attitude perception decides whether the horizontal and vertical curriculums have been mastered (Mabuto, 2019; Tareva et al., 2022). In addition, School managers are required to supervise curriculum with a solid understanding of employing mixed podium and it delivers feedback for both vertical and horizontal curriculum. Additionally, it is evident that a pragmatic curriculum enables school managers to sacrifice their own EdTech supervision aids and finances to supervise curriculum because it encourages curriculum supervision information by using experiences/perceptions as a way to deal with new things, both in personal and community life (Daber, 2022; Mafenya, 2016).

## **7.5 Problematising Perceptions in the Use of EdTech Supervision Aids to Supervise Curriculum**

The literature and key findings from this study indicate that school managers' practises when using EdTech supervision aids to supervise curriculum are shaped by knowledge perception. Further to this, knowledge perception emerges when school managers are compelled to adhere to an established document/policy, such as the CAPS document and the personal administrative measures (PAM) document (Mahlambi, 2020; Nzuza, 2019). This becomes challenging when school managers concentrate only on prescribed documentation (CAPS) rather than collaborating with and sharing information with other staff members. As a result, knowledge perception only motivates school managers to employ an instrumental schedule while delivering professional development to achieve curriculum supervision objectives. Furthermore, the findings of this study concur with the literature review, which discovered that few school managers use EdTech supervision aids to supervise curriculum inspired by skill perception. Furthermore, skill perception transpires when school managers' operations are dictated by social experiences; this suggests that school managers express knowledge (Khoza, 2019a; Mabuto, 2019). Additionally, if school managers focus solely on their social experiences (skill perceptions) to supervise curriculum using EdTech supervision aids, this causes uncertainty and nervousness because school managers lack adherence to any document/policy. As a result, skill perceptions encourage school managers to frequently rely on online curriculum supervision (WhatsApp) to accomplish school managers-centred matters (activities) during school time. Furthermore, attitude perception occurs when school managers integrate knowledge that they have imparted themselves, and it is dependent on individual interpretation. This creates a problematic condition if school managers are dependent on personal expertise earned outside of university or college. This suggests that at this level (attitude perception), school managers employ learned knowledge to attain leadership aims in lesson preparations. As a result, it becomes problematic when school managers' actions are not evenly guided by all levels of perception. Consequently, the intended curriculum is not implemented properly in such a way that academics' performance does not become hundred per cent (100%). Furthermore, when school managers do not treat these levels (knowledge, skill, and attitude) equally while using EdTech supervision aids to supervise curriculum, they fail to do justice to education as a whole/system. Moreover, the comprehensive use of EdTech supervision aids in supervising is the main reason for quality assurance in the achievement of

curriculum supervision for the desired curriculum goals. In short, if school managers do not rely on a comprehensive use of EdTech supervision aids when supervising curriculum, quality assurance in the delivery of a high-quality education can be compromised, and school managers would be unable to remain competitive on a worldwide scale. As such, what was extracted from the literature and added to the conclusions of this study is that perception levels are off balance as illustrated (see Figure 7.11 below).

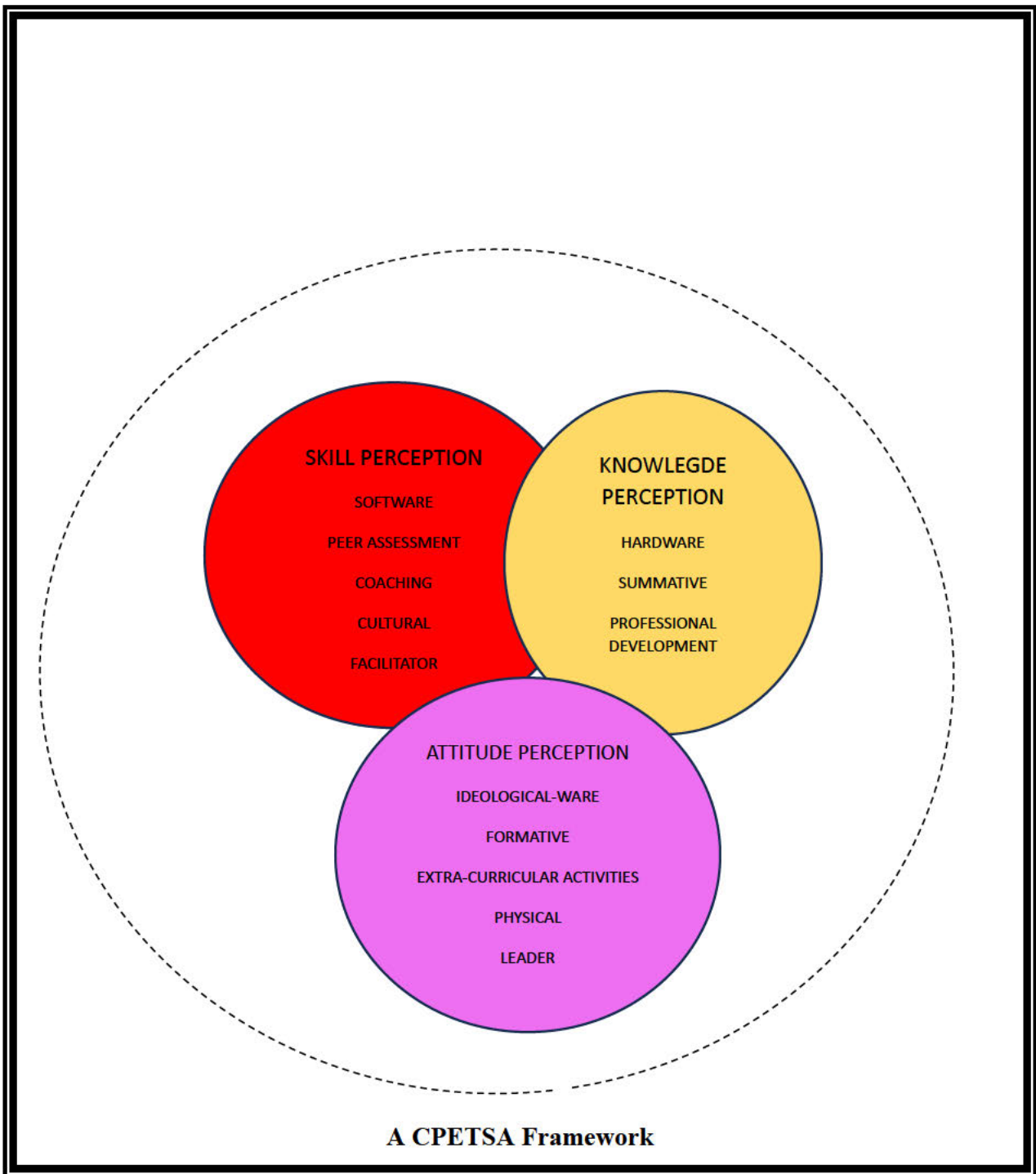


**Figure 7.11 Imbalance of Levels of Perceptions When Using EdTech Supervision Aids When Supervising Curriculum**

### **7.6 Towards the Development of Comprehensive Perceptions on the Use of EdTech Supervision Aids to Supervise Curriculum**

Furthermore, this study contends that for the comprehensive perceptions of EdTech supervision aids framework (CPETSA framework). Refer to Figure 7.12 below, which presents an example. Thus, school managers' capabilities are guided by the CPETSA framework, curriculum supervision implementation can be established, and school managers can cope with worldwide competition. Moreover, the CPETSA framework has the potential to enhance the quality assurance of curriculum supervision throughout the education system. As a result, the CPETSA framework seeks whatever EdTech supervision aids (smartphones, laptops, whiteboards, desktops, printers, and tablets) to accommodate all curriculum levels (vertical,

horizontal, and pragmatic), thereby providing insight. Similarly, the CPETSA framework below, Figure 7.12, offers a solution to school managers' ambiguous perceptions about the use of EdTech supervision aids during the curriculum supervision process.



**Figure 7.12 Comprehensive Perceptions on the Use of EdTech Supervision Aids in Curriculum Supervision**

Additionally, the knowledge perception level covers the curriculum's formal/vertical side, which is informed by curriculum elements like as knowledge justification, hardware EdTech supervision aids, professional development, financial approachability, objectives, organiser, content-based matter, face-to-face podium, summative inspection, and the instrumental schedule (Mlaba, 2020; Zuma, 2019b). Thus, the knowledge perception seeks to address

subjects' needs through the process of the vertical curriculum (Mpungose, 2017, 2020b). Further, the skill perception level is intended to tackle horizontal curriculum elements such as skill justification, software EdTech supervision aids, coaching, peer inspection, online podium, facilitator, culture approachability, school time, manager-based matter, and outcomes (Mlaba, 2020; Ndlovu, 2022a). This suggests that the skill perception level addresses the needs of the society/supervisees using the EdTech supervision aids (Makumane & Khoza, 2020). Consequently, the level of attitude perception addresses curriculum origins such as attitude justification, ideological-ware EdTech supervision aids, extra-curricular activities, formative inspection, blended podium, leader, extra-time, supervisee-based matter, aims, and physical approachability (Mlaba, 2020). In a nutshell, while using EdTech supervision aids, the attitude perception level addresses the individual personal demands (identification) of supervisees during the curriculum supervision process. Furthermore, the study demonstrates that there is a lack of comprehensive perceptions at three levels when using EdTech supervision aids to supervise curriculum. As a result, the CPETSA framework can be the instrument with the greatest prospects for using EdTech supervision aids to supervise curriculum.

Furthermore, perception has been placed at the centre of two key reasons: First, because it is the phenomenon under study, the study must exhibit comprehension from start to end; and second, if curriculum supervision is not at the centre, or if it is ignored or interpreted incorrectly the curriculum cannot take any shape or be comprehensive. As such, regardless of the type of curriculum that is developing, curriculum supervision is the point of departure. Additionally, attitude perception, which develops into a pragmatic curriculum; skill perception, which emerges into a horizontal curriculum; and knowledge perception, which evolves into a vertical curriculum, are used to supervise the curriculum. Hence, the principles of the CPETSA framework, as shown in Table 7.1 below, underpin these three categories of perceptions and curriculum. A balanced curriculum must encompass all levels of perception.

**Table 7.1 The Principles of CPETSA Framework and Perception Levels in Curriculum Supervision**

<b>Themes (Curriculum Elements)</b>	<b>Profiles of school managers alignment.</b>	<b>Level of Perception</b>
EdTech supervision aids	Hardware	Knowledge
	Software	Skill
	Ideological-ware	Attitude
Approachability	Physical	Attitude
	Financial	Knowledge
	Culture	Skill
Course of Instruction	Professional development	Knowledge
	Coaching	Skill
	Extra-curricular activities	Attitude
Justification	Knowledge	Knowledge
	Skill	Skill
	Attitudes	Attitude
Inspection	Summative	Knowledge
	Peer	Skill
	Formative	Attitude
Responsibilities	Organiser	Knowledge
	Facilitator	Skill
	Leader	Attitude
Desires	Objectives	Knowledge
	Outcomes	Skill
	Aims	Attitude
Schedule	Instrumental	Knowledge
	School time	Skill
	Extra time	Attitude
Matter	Content-based matter	Knowledge
	Managers' based matters	Skill
	Supervises 'matters	Attitude
Podium	Face-to-face	Knowledge
	Online	Skill

	Blended	Attitude
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## 7.7 This Study's Conclusion

The purpose of this study was to explore school managers' perception of the use of EdTech resources to supervise curriculum within the context of schools in the Zululand District Municipality. Furthermore, exploring this topic was critical in addressing the three research questions, which are:

1. What are school managers' perceptions of the use of technological resources to supervise the curriculum?
2. How do school managers perceive the use of technological resources when supervising curriculum?
3. Why do school managers perceive the use of technological resources when supervising curriculum in the manner that they do?

These questions were informed by three research objectives, namely: to understand school managers' perceptions of the use of technological resources to supervise the curriculum; to find out whether school managers feel well equipped to use technological resources to supervise curriculum; and to determine the challenges perceived by school managers when using technological resources to supervise curriculum.

As a result, to accomplish these objectives, the most suitable literature on the phenomena of the study, providing the readers with the most in-depth knowledge, was implemented. Similarly, the literature provides an in-depth understanding of the curriculum and the principles that constitute it. Moreover, the study was designed more towards the level of knowledge perception, in which the data gathered may be perceived as reality or truth. Likewise, the adoption of an interpretivism paradigm incorporates a phenomenological research study, and the use of the TPACK theory was instrumental in achieving the objectives of this study. Furthermore, three data generation approaches were adopted: focus groups, reflective activities, and one-on-one semi-structured interviews. These approaches were chosen based on what was necessary to properly address the study's research objectives. In addition, the study was set at a personal level; to my mind, all the data obtained proved reliable

in terms of determining what to supervise. Similarly, when I supervised focus groups and relied on their plan, I acknowledged the demands of school managers. This assumed the part of an attitude perception level.

Additionally, the study identified gaps among the three levels of perception. Furthermore, curriculum developers are mute about the available EdTech supervisory aids in school settings. At the moment, schools lack a policy that instructs school managers on how to supervise curriculum using EdTech supervision aids. This indicates that the level of knowledge perception has been forsaken. Similarly, the attitude perception level linked to the needs of school managers is overlooked. As a result, school managers might find it difficult to establish their personal identities inside EdTech supervision aids and for the curriculum from which they supervise. However, by using a phenomenological research study focused on releasing school managers, this study succeeded in closing the gap among school managers. Moreover, the clustering of curriculum elements and perception levels was implemented. As a result, this clustering was carried out to balance the vertical, horizontal, and pragmatic curriculums, assisting in the achievement of curriculum supervision. Furthermore, these three levels are crucial to school managers since the curriculum addresses all demands. As a result, I propose that school managers balance the curriculum they supervise without jeopardising themselves.

In this study, transparent coordination of chapters with was provided, providing readers with an in-depth understanding of this study. Similarly, Chapter One offers an overview of the research. The study's summary is presented in this chapter. Likewise, Chapter Two reflects on a review of knowledge literature that provides insight into the research phenomenon, curriculum, and EdTech supervision aids. In addition, Chapter Three discusses curriculum sources that are used to frame themes. The theoretical framework (TPACK) is presented in Chapter Four. Furthermore, Chapter Five discusses the study's methodology. Chapter Six presents data and interprets findings. As a result, Chapter Seven brings the research to a climax.

## 7.8 Summary

Discussed in this chapter were summary of the findings and recommendations emanated from each theme, dialogue on perceptions and EdTech supervision aids in the use of curriculum supervision, problematising perceptions in the use of EdTech supervision aids to supervise

curriculum, and the development of comprehensive perceptions on the use of EdTech supervision aids to supervise curriculum

## APPENDIX

### APPENDIX A CONSENT LETTER



Curriculum Studies, School of Education,  
College of Humanities,  
University of KwaZulu-Natal,  
Edgewood Campus,  
Dear participant

### INFORMED CONSENT LETTER

I am Biyela Thokozani Andreas and I am conducting a research as a requirement at the University of KwaZulu-Natal towards a Degree of Doctor of Philosophy. The title of the research is School managers Perceptions on the Use of Technological Resources to Supervise Curriculum): The Context of COVID-19. The objectives of the study are:

To understand school managers' perceptions on the use of technological resources to supervise the curriculum.

2. To find out whether school managers feel well equipped to use technological resources to supervise the curriculum.

3. To determine the challenges perceived by school managers when using technological resources to supervise the curriculum.

The study will focus on the use of Technological Resources to supervise Curriculum. This letter intends to elucidate the purpose of the study and to request your participation in the study.

Please note that:

- Your confidentiality is guaranteed, as your inputs will not be attributed to you in person, but reported only as a population member opinion.
- The interview and focus groups discussions may last for about 35 minutes, relevant documents will be analysed, and the reflective activity will be sent to you via e-mail.
- Any information given by you cannot be used against you, and the collected data will be used for purposes of this research only.
  - There will be no limit on any benefits that you may receive as part of your participation in this research project;
  - Data will be stored in secure storage and destroyed after 5 years.
  - You have a choice to participate, not participate or stop participating in the research. You will not be penalized for taking such an action.

Annexure: Consent letter for the participants (teachers).

- You are free to withdraw from the research at any time without any negative or undesirable consequences to yourself;
- Real names of the participants will not be used, but symbols such as A, B, C, D, E and F will be used to represent your full name;
- Your involvement is purely for academic purposes only, and there are no financial benefits involved.
- If you are willing to be interviewed, please indicate (by ticking as applicable) whether or not you are willing to allow the interview to be recorded by the following equipment:

	Willing	Not willing
Audio equipment		
Photographic equipment		
Video equipment		

I can be contacted at:

Email: [REDACTED]

Cell: + [REDACTED]

My supervisor is Dr. Cedric Bheki Mpungose who is located at the School of Education, Edgewood Campus of the University of KwaZulu-Natal. Contact details:

Email: mpungosec@ukzn.ac.za

Phone: +27 31 260 3671.

Cell: + [REDACTED].

Discipline Coordinator is Prof. Labby Ramrathan  
Curriculum Studies, School of Education,

Edgewood College, University of KwaZulu-Natal (Tel) 031 260 8065, Email: Ramrathanp@ukzn.ac.za

## APPENDIX B GATE KEEPERS LETTER



**KWAZULU-NATAL PROVINCE**

EDUCATION  
REPUBLIC OF SOUTH AFRICA

**OFFICE OF THE HEAD OF DEPARTMENT**

Private Bag X9137, PIETERMARITZBURG, 3200  
Anton Lembede Building, 247 Burger Street, Pietermaritzburg, 3201  
buyi.ntuli@kzndoe.gov.za  
Tel: 033 392 1051

**Email:**

**Enquiries:** Buyi Ntuli  
Mr Thokozani Andreas Biyela

**Ref.:**2/4/8/7191

P.O. Box 467

**MAHLABATHINI**

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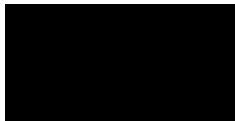
Dear Mr Biyela

### **PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS**

Your application to conduct research entitled: **“SCHOOL MANAGERS PERCEPTIONS ON THE USE OF TECHNOLOGICAL RESOURCES TO SUPERVISE CURRICULUM:”** in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.

4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the Intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from **11th November 2021 to 30th November 2023**.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Miss Phindile Duma at the contact numbers above.
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report/dissertation/thesis must be submitted to the research office of the Department. Please address it to The Office of the HOD, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to schools and institutions in KwaZulu-Natal Department of Education.



**Dr M.J.B. Mthembu**  
**Acting Head of Department: Education Date: 11th November 2021**

**GROWING KWAZULU-NATAL TOGETHER**

## APPENDIX C CLEARANCE CERTIFICATE



Thokozani Andreas  
Biyela (207522305)  
School Of Education  
Edgewood Campus

**Dear TA Biyela**

**Protocol reference number:** HSSREC/00004390/2022

**Protocol reference number:** HSSREC/00004390/2022

**Project title:** School managers' perceptions on the use of technological resources in curriculum supervision

**Degree:** PhD

**Approval Notification – Expedited Application**

This letter serves to notify you that your application received on 13 June 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 27 July 2023.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040). Yours sincerely,

-----  
**Professor Dipane Hlalele (Chair)**  
 /dd

**APPENDIX D: DATA GENETARION INSTRUMENTS 2023**

**Data Generation instruments**  
**Reflective activity**

**Project title: School managers Perceptions on the use of Technological Resources to Supervise Curriculum  
 : The Context of Covid- 19**

**Name of the participant: \_\_\_\_\_**  
**School: \_\_\_\_\_**

This Reflective Activity is for exploring the school managers’ perceptions on the use of technological resources to supervise curriculum. You may use various sources to complete this activity. Presents your reflections/experience by following the TPACK framework components as follows:

**Technological Knowledge**

<b>Question 1.1</b>	<b>Which technological resources do you use to supervise curriculum?</b>
<b>Resources</b>	

<b>Question 1.2</b>	<b>Why do you use technological resources supervise the Curriculum? (reasons)</b>
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<b>Rationale</b>	
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**Content Knowledge**

<b>Question 1.3</b>	<b>What content of curriculum are you supervising using technological resources?</b>
<b>Content</b>	

**Pedagogical Knowledge**

<b>Question 1.4</b>	<b>How do you access technological resources to supervise the curriculum, in terms of financial, cultural and physical access?</b>
<b>Accessibility</b>	

<b>Question 1.5</b>	<b>Towards which goals are you using technological resources to supervise curriculum?</b>
<b>Goals</b>	

<b>Question 1.6</b>	<b>What activities are facilitated using technological resources for curriculum supervision?</b>
<b>Activities</b>	

<b>Question 1.7</b>	<b>What roles do you play in the use of technological resources when supervising the curriculum?</b>
<b>Roles</b>	

<b>Question 1.8</b>	<b>Where do you use technological resources to supervise curriculum? (location/environment)</b>
<b>Location</b>	

<b>Question 1.9</b>	<b>When do you use the technological resources to supervise the curriculum?</b>
<b>Time</b>	

<b>Question 1.10</b>	<b>How do you assess/evaluate the effectiveness of the use of technological resources to supervise the curriculum?</b>
<b>Assessment</b>	

### One-on-one (individual) semi-structured interviews

<b>Question 1.1</b>	<i>What technological resources do you use to supervise curriculum?</i>
Sub questions	<ul style="list-style-type: none"> <li>• What software resources do you use to supervise Curriculum?</li> <li>• What hardware resources do you use to supervise into curriculum?</li> <li>• Which ideological-ware (s) that guide(s) you to use technological resources when supervising curriculum?</li> </ul>
<b>Question 1.2</b>	<i>Why do you use Technological Resources to supervise Curriculum? (reasons)</i>
Sub questions	<ul style="list-style-type: none"> <li>• What knowledge reasons that made you to use Technological Resources to supervise Curriculum?</li> <li>• What skill reasons that made you to use Technological Resources to supervise Curriculum?</li> <li>• What are your attitude reasons that made you to use technological Resources to supervise Curriculum?</li> </ul>
<b>Question 1.3</b>	<i>What content do you supervise using technological resources to supervise curriculum?</i>

Sub questions	<ul style="list-style-type: none"> <li>• What is the content do you supervise when using technological resources to supervise curriculum?</li> </ul>
<b>Question 1.4</b>	<i>How do you use your pedagogical knowledge with technological resources to supervise curriculum?</i>
<b>Question 1.5</b>	<i>Towards which goals are you using technological resources to supervise curriculum?</i>
<b>Question 1.6</b>	<i>What activities are facilitated using technological resources for curriculum supervision?</i>
<b>Question 1.7</b>	<i>What roles do you play in the use of technological resources when supervising curriculum?</i>
<b>Question 1.8</b>	<i>Where do you use technological resources to supervise curriculum?</i>
<b>Question 1.9</b>	When do you use technological resources to supervise curriculum?
<b>Question 1.10</b>	How do you assess/evaluate the effectiveness of the technological resources to supervise curriculum?

## Focus group

Focus group discussion

Names of the participants: \_\_\_\_\_

Time: \_\_\_\_\_

Date: \_\_\_\_\_

1. What technological resources do you use when supervising curriculum?
2. Why do you use Technological Resources to supervise Curriculum? (reasons)
3. What content do you supervise when using technological resources into curriculum supervision? (Content)
4. How do you use technological resources to supervise curriculum, in terms of financial, cultural, and physical aspects? (Accessibility)
5. Towards which goals are you using technological resources to supervise curriculum? (goals)
6. What are supervisory activities do you use with technological resources into the curriculum supervision? (Activities)
7. How do you perceive your character when using technological resources to supervise curriculum? (managers' role)
8. Where do you use technological resources to supervise curriculum? (location/environment)
9. What is the time allocated for each aspect (topic) when using technological resources to supervise curriculum? (time)
10. How do you assess your supervision, when using technological resources to supervise curriculum? (assessment)

## **APPENDIX E. EDIT CERTIFICATE**

05 December 2023

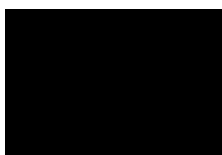
To whom it may concern

Re. Thesis: School managers' Perceptions on the Use of Technological Resources in Curriculum Supervision in the context of COVID-19

This letter serves to confirm that I edited Thokozani Andreas Biyela's (Student No. 207522305) thesis before submission.

No content was added and little was changed by me during the process. Changes were limited to spelling and grammar, while content changes were identified and submitted to Mr. Biyela for review.

Please feel free to contact me should you have any further questions.



Christine Davis

## APPENDIX F: TURNITIN CERTIFICATE

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**CHAPTER One**  
**1.1 Introduction**

The major purpose of this chapter is to provide a clear and logical structure to my study. This chapter reveals all key areas and provides information on the study. It further provides the direction the study will take making this clear in the reader's mind from the beginning. Furthermore, key areas like the title, purpose, location, rationale, problem statement, research questions, and objectives of the study are outlined. Moreover, a brief outline of the reviewed literature is given and how the issue of a gap in knowledge, has been addressed by the study. Further to this, the abridged research design and methodology are outlined. It further addresses the following aspects: qualitative approach, paradigm, style, sampling, data-generating methods, data analysis, trustworthiness, and the limitations of the study.

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