

Enhancing pre-service English first additional language teachers' digital competencies in lesson planning and presentation

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Thesis accepted for the degree *Magister Educationis* in
Education for Curriculum Studies at the North-West University

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DECLARATION

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DEDICATION AND ACKNOWLEDGEMENTS

Whenever a person achieves something, it is almost impossible to assume that he/she did it alone without the help, support, and guidance from others. This research study could not have been done by me alone. There are so many people who helped, guided, and strengthened me throughout the course of completing this degree. I would, therefore, like to thank those who supported me to complete this study.

The first and most important person I would like to thank is my husband, Jonker Venter, who continually supported me and held my hands high when I grew tired. My three children, Alexander, Clarinda, and Matthias, who had to give up precious time with me so that I can complete my degree and often took over some of my household tasks to support me.

I would like to express my gratitude towards Prof. Kotie Kaiser and Dr Elma Marias, who supported, mentored, guided, and taught me so much through the past years.

I would also like to thank my parents who graciously supports all my educational endeavours, both emotionally and financially. I am forever grateful for the hard-working example and opportunities that they have given me.

Many thanks to my sister, Mariaan, who is always willing to help and encourage me in everything I do.

Finally, I would like to thank the North-West University who granted me post-graduate bursaries to complete this degree and for the resources I was able to use.

SOLI DEO GRATIA.

ABSTRACT

As times are changing, and becoming more digital orientated, teachers need to look at the methods they use to prepare their lessons and present the content to the learners. Technology plays an important part in the world around us and during the pandemic, teachers had to quickly adapt to using technology during their classroom instruction. The technological skills are crucial at university level, because the necessary training is needed for pre-service teachers to know how to use technology effectively in their lessons. This participatory action learning and research (PALAR) project focused on collaborating with pre-service teachers to provide guidelines for pre-service teachers on enhancing their digital competencies in their lesson planning and presentation phases. Six pre-service teachers took part in the research project and held nine interactive meetings to look at ways to actively solve the problem at hand. Data analyses were done by coding verbatim transcriptions of group meetings with *ATLAS.ti*, photovoice and coding reflective journals. These led to the providing of guidelines for pre-service teachers in using technology in their teaching moment during their lesson presentation.

Key terms: pedagogical knowledge; content knowledge; pedagogical content knowledge; technological pedagogical content knowledge, English First Additional language; teaching moment; digital competencies; digital literacy

OPSOMMING

Soos tye verander en meer digitaal georiënteerd word is dit noodsaak dat onderwysers kyk na die metodes wat hulle gebruik om hulle lesse voor te berei en die inhoud aan te bied. Tegnologie speel 'n belangrike rol in die wêreld rondom ons. Gedurende die pandemie was dit noodsaaklik vir onderwysers om vinnig aan te pas om tegnologie te gebruik tydens hulle klas aanbiedings. Die behoefte vir tegnologie vaardigheid begin al reeds op universiteits vlak, en die nodige opleiding vir toekomstige onderwysers om te weet hoe om tegnologie effektief te gebruik in hulle lesse. Hierdie deelnemende-aksie navorsingsprojek (PALAR) het daarop gefokus om saam met onderwys studente te werk om riglyne te voorsien vir onderwys studente om tegnologie effektief in die onderrigsmoment te gebruik. Daar het ses onderwys studente aan die projek deel geneem deur middel van nege interaktiewe groepsbesprekings, om die probleem op hand aan te spreek. Data analyses was gedoen deur transkripsies van die groepsbesprekings, fotostem en reflektiewe joernale te kodeer met gebruik van *ATLAS.ti*. Dit het gelei tot die ontwerp van riglyne vir onderwys studente om tegnologie effektief te gebruik in die onderrigsmoment van hulle lesse.

Sleuteltermes: pedagogiese kennis; inhoudskennis; pedagogiese inhoudskennis; tegnologiese pedagogiese inhoudskennis; Engels eerste addisionele taal; onderrigsmoment; digitale bevoegdheid; digitale geletterdheid

LIST OF ABBREVIATIONS

PK	Pedagogical knowledge
CK	Content knowledge
PCK	Pedagogical content knowledge
TPACK	Technological pedagogical content knowledge
SAMR	Substitution, Augmentation, Modification and Redefinition
EFAL	English First Additional Language
ESL	English Second Language
EFL	English as Foreign Language
ICT	Information and Communications Technology
DBE	Department of Basic Education
PIRLS	Progress in International reading Literacy Study
TIMMS	Trends in International Math and Science Study
ISTE	International Society for Technology in Education
PALAR	Participatory action learning and research
KAL	Knowledge about language
L2	Second language
TCA	Thematic content analysis
WIL	Work integrated learning
CAPS	Curriculum and policy statement
UODL	Unit of distant learning

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CHAPTER 1 INTRODUCTION

1.1 Introduction and background

Individuals today live in a fast-paced world where one must constantly be aware of new research and development to keep up with the ever-changing surroundings. Teachers are under even more pressure as they need to guide learners through this changing world in the technological age. They need to be conversant in the latest trends and guide their learners to equip them with the necessary knowledge and skills required for the 21st century. Additionally, teachers need to keep up with national government performance expectations and develop themselves as professional educators (Peck, Augustine & Popp., 2003:21).

One area in the South African context that needs more attention, is the use of technology as a teaching strategy in the teacher preparation and presentation process (Angeli, 2005; DBE, 2015; Peck *et al.* 2003; Pope *et al.*, 2002). There are numerous advantages of incorporating technology in teacher's preparation and teaching strategies. When technology is utilised correctly, it has the ability to unlock valuable opportunities and skills for teachers and learners. According to the International Society for Technology in Education (ISTE), these advantages include that learners become competent in using technology; that learners are better trained in looking for new information and know how to evaluate and analyse it; that learners can make independent decisions and know how to solve problems; that learners can be more creative and become "effective users of productivity tools"; and that learners become competent "communicators, collaborators, publishers, and producers" who become "informed, responsible, and contributing citizens" (Kelly, 2002:14). Learners become actively involved in problem solving as they adopt a 'hands-on' and 'do-it-yourself' attitude.

Considering some of the keywords in the advantages mentioned for using technology as a teaching platform in lesson presentation, it is clear that it utilises many of the action words used in Bloom's taxonomy (which enable learners to move from a low cognitive thinking level to a higher level of cognitive thinking) (Wilson, 2016). This means that if technology is used correctly, it can assist teachers in the scaffolding needed in lesson presentation. Additionally, the ISTE (Kelly, 2002:16) argues that the main aim of teaching with technology as a resource to help and assist teachers is to move away from traditional learning environments to new learning environments. For this to occur, it is necessary that teachers be equipped in the use of technology in lesson planning and incorporating it effectively to enhance learners' learning experience to help them become critical thinkers and problem-solving individuals. This includes changing a teacher-centred classroom environment to a learner-centred environment. It also includes moving from a

single-sense stimulation to a multisensory stimulation and going from a single-path progression to a multipath progression (Kelly, 2002:16). Isolated work becomes collaborative work and single media usage becomes multimedia usage (Kelly, 2002:16). With technology-based strategies, passive learning also becomes active and inquiry-based learning where reactive responses become proactive (Kelly, 2002:16). Furthermore, learners progress from factual knowledge-based learning to become critical thinkers and informed decision makers (Kelly, 2002:16).

The English First Additional Language curriculum outcomes correspond with the advantages mentioned by the ISTE in the sense that the National Curriculum Statement for Grades R to 12 aims to improve learners' ability to "identify and solve problems" as well as to become critical thinkers (DBE, 2011:5). The National Curriculum Statement also aims to enable learners to collaborate well with team members as well as being able to "collect, analyse, organise and critically evaluate information" (DBE, 2011:5). Additionally, the National Curriculum Statement aims to communicate well with learners through various modes which include images, media, and languages. It also uses technology with science to emphasise the importance of taking responsibility for the environment (DBE, 2011:5). Yet, these mentioned advantages, afforded by including technology in teaching, are absent for many of the South African learners.

When analysing the results of the Grade 1 to 9 learners' English First Additional Language as reported by the Department of Basic Education (DBE, 2014:9), it is evident that many learners have not yet acquired the skills of critical thinking, informed decision making, have multisensory stimulation, collaborative work, active learning and proactive responses in English as their first additional language. Considering learners' English Home Language results from 2014, it is clear that many learners have not even acquired these skills in their home language. To further highlight the gap in South African learners' language proficiency, the Progress in International Reading Literacy Study (PIRLS) results of 2016, which is an international study that tests Grade 4 learners' reading literacy, indicate that South Africa's Grade 5 learners produced the poorest test results of 51 countries tested (Mullis *et al.*, 2017). This corresponds with the Third International Math and Science Study (TIMSS) done in 2015, which evaluates mathematic skills in Grade 4 and 8 learners. Out of 49 countries tested, South Africa held the second-to-last place in the Intermediate Phase category (Mullis *et al.*, 2017).

¹ English First Additional Language refers to when learners do not speak English as a Home Language or when English is learners' mother tongue. Home Language refers to when learners speak English in their home and the language is their mother tongue.

By looking at these results from previous years, it is evident that a bigger problem arose for online language teaching when the COVID-19 pandemic struck at the end of 2019 and schools were forced to close to prevent the spread of the virus. This led to an even bigger problem for learners in South Africa who simply do not have access to resources and could not prepare for the sudden transition to online learning in such a short time (Spaull, 2020:569). In short, Spaull (2020:569) claims that South African learners did not continue their learning at home during the national lockdown period due to COVID-19.

Due to this unforeseen and sudden shift towards online teaching, teachers were urged to immediately know how to teach effectively using technology. For reasons beyond a sudden pandemic striking the world, it is necessary for teachers to have the necessary competency and knowledge on how to incorporate and use technology correctly in their lesson preparation and instruction (Wiske, Franz & Breit, 2005:xii). Koehler and Mishra (2009:61) claim that combining technology and teaching is not an easy task as “technologies are neither neutral nor unbiased”. Koehler and Mishra (2009:61-62) also postulate that technologies have their own “propensities, potentials, affordances, and constraints that make them more suitable for certain tasks than others”. It is challenging to incorporate technology in lesson preparation and use it correctly in lesson presentation as effective teaching methods and strategies. It is, therefore, necessary that “integration efforts should be creatively designed or structured for particular subject matter ideas in specific classroom contexts” (Mishra & Koehler, 2009:62).

This involves the combination of teachers’ pedagogical and content knowledge with their technology knowledge. In the South African context, integrating technology has its own challenges in terms of resource availability. Many South African schools do not have the necessary facilities like electricity, books, or even classrooms equipped with the necessary resources. It can therefore be said that many learners likely do not have access to the internet and computers for online learning (Gustafsson & Deliwe, 2020:3). While it has been established that combining technology and teaching is somewhat challenging, it is necessary for teachers to actively find “new ways of comprehending and accommodating this complexity.” Though, very little attention has been given to training teachers in using digital literacies in their training programmes (Koehler & Mishra, 2009:62; Admiraal *et al.*, 2017; Chien *et al.*, 2012).

This is where Shulman’s concept of pedagogical content knowledge (PCK) plays an important part. Koehler and Mishra (2006; 2009) designed a framework, called the Technology, Pedagogical and Content Knowledge (TPACK) framework, which primarily focuses on teaching effectively with technology. It is necessary to note that Shulman’s original PCK concept did not include technology. In Shulman’s definition of PCK, he also maintained the following: “since there

are no single most powerful forms of representation, the teacher must have at hand a veritable armamentarium of alternative forms of representation. Some of which derive from research whereas others originate in the wisdom of practice” (Shulman, 1986:9). This “wisdom of practice” refers to “a quality of discernment in practice,” how teachers decide to act, the choices they make about content, teaching strategies, learner activities and assessment within the unique contexts that they teach” (Romylos, 2018:86).

The context of teaching in this day and age, and especially during the COVID-19 pandemic, asks of teachers to discern what is needed to enhance and improve their teaching and ultimately the learning of their learners. The inclusion of technology may be instrumental in enhancing and improving teaching and learning in the TPACK framework. Content knowledge (CK) involves “teachers’ knowledge about the subject matter to be learned or taught”. It is also prescribed in the professional development framework for digital learning (DBE, 2015:9) to “improve the professionalism, teaching skills, subject knowledge and computer literacy of teachers throughout their careers”.

One way for teachers to include technology in their lessons is to follow the SAMR model which was designed by Puentedura and gained popularity in 2012 for providing four approaches that are combined with Bloom’s taxonomy to include, use, and evaluate technology in classroom settings (Hamilton *et al.*, 2016; Puentedura, 2006;). These four approaches include Substitution, Augmentation, Modification and Redefinition and aim to “move up from lower to higher levels of teaching with technology (Hamilton *et al.* 2016:2; Puentedura, 2006). The substitution and augmentation approaches are part of the enhancement of technology section, while the modification and redefinition fall under the transformation of technology section (Puentedura, 2006).

With substitution, it is meant that technology is used to “act as a direct tool substitute, with no functional change.” An example for this in the English classroom is to have a digital copy of Shakespeare’s Macbeth (Puentedura, 2013). With augmentation, it is meant that technology is used as a substitute, but enhances the use of the product which can be having a digital version of Shakespeare’s Macbeth which provides section links for the different acts in the play which make it easier for the reader to navigate between the scenes (Puentedura, 2008; Puentedura, 2013). The modification section results in technology allowing “significant task redesign” which can include adding visual representations and information to sections of Shakespeare’s Macbeth (Puentedura, 2008, 2013). Finally, with redefinition is meant that a total transformation occurs using technology to create new tasks which were “previously inconceivable” and an example in the English classroom is to take Shakespeare’s Macbeth and transform it by creating a video that

leads the reader through the halls and settings of the play (Puentedura, 2008, 2013)

Thus, utilising technology has the ability to unlock useful skills in teachers and learners such as critical thinking, proactive responses, collaborative work, as well as developing learners' multisensory skills.

1.2 Problem statement

1.2.1 Rationale

Technology has been around for a number of years, but new research in the field acknowledge technology as a resource for online teaching (Mishra & Koehler, 2006). Technological platforms are expanding every day and educators need to look to new means of teaching to be able to support their learners, especially as seen during the COVID-19 lockdown period (Chien *et al.*, 2012:578; Peimani & Kamalipour, 2020).

One of the main problems that arise, is that teachers do not know how to use and incorporate technology correctly and effectively due to their lack of technological knowledge (Angeli, 2005:383). On the other hand, many teachers are bombarded with too many options of available technological resources without enough guidelines to use it. This ultimately confuses teachers. The teachers in Netherlands that took part in an empirical study (completed by Admiraal *et al.*, 2017:107) even before the COVID-19 lockdown, stated that they simply feel “overwhelmed with information about the use of technology in subject teaching.” Additionally, technology has been included in very few teacher training programmes in the global context and not much attention has been given to this form of teaching (Admiraal *et al.*, 2017:105; Chien *et al.*, 2012).

According to Pope *et al.*, (2002:19), there exists a gap between what pre-service teachers are taught about technology and what is expected of them in real-life situations inside the classroom. On the other hand, those who received training but do not have the necessary facilities, do not use the knowledge they have gained. This gap now only becomes bigger as English language teachers suddenly need to teach online. Specific knowledge about technology integration is expected of pre-service teachers, which seems to be lacking in real-life situations. However, the Department of Basic Education is aware of this gap in knowledge about technology integration and addresses this specific issue regarding technology in the Framework for Digital Learning (Angeli, 2005:383; DBE, 2018; Pope *et al.*, 2002:191).

Real-life was disrupted when the announcement came that all teaching in classrooms and physical teaching was suspended and needed to move online in South Africa as well as

worldwide. Yandell (2020:262) states that this transition is different from simply moving your classroom. It takes a set of skills that a teacher needs to have that entails more than just converting PowerPoint slideshows to Portable Document Format (pdf.). It involves the teacher as a valuable asset to connect the interests of learners and engage them with their work through online teaching.

The International Society for Technology in Education (ISTE) claims that it is crucial that teachers are well-prepared and know how to use technology to “empower” their learners in all areas of subject matter with the numerous advantages of using technology as a medium of learning (Kelly, 2002:15). Globally, about 44% of “new teachers”, who have fewer than three years of classroom experience, are equipped to incorporate technology in their teaching methods, but there is a rising concern that teachers rarely use computers in their teaching (Angeli, 2005:384). Even if teachers have some sort of strategy in mind, the sudden need arises from the fact that learners might not have the necessary resources (Yandell, 2020:262), especially in a third world country like South Africa.

Through my experience as an external marker for NWU and later as a junior lecturer, it was also noted that the student teachers who incorporate technology during their lesson plan presentations at the North-West University, still do not use technology effectively. Technology is used just for the sake of using technology and not as a means to facilitate true learning. Angeli (2005:384) claims that “educational reforms in teacher education stress the need for innovative teacher education restructuring to ensure that pre-service teachers not only understand how to use a computer, but also how to design high quality technology-enhanced lessons.” Castillo (2017) claims in his study that teaching online and guiding learners through the use of digital literacy, learners can improve the development of their early reading skills.

Therefore, the TPACK and SAMR models will be used to indicate how it attributes to digital literacies in lesson planning and presentation.

1.3 Technological Pedagogical and Content Knowledge (TPACK) framework

Everywhere we turn, there is a cell phone, television screen, display board and internet which open a whole new world to information and new knowledge. The question arises: why not use technology as a means of conveying valuable input to learners as they are already exposed to technology? The technological pedagogical and content knowledge (TPACK) framework was mainly developed by Punya Mishra and Matthew Koehler (Mishra & Koehler, 2006). This framework is based on the PCK notion that was coined by Shulman (Mishra & Koehler, 2006;

Shulman, 1986, 1987). Due to changing times and the development in technology, Mishra and Koehler (2006) saw an opportunity to use technology as a platform and valuable resource in teaching.

Using technology has become a common and in fact, very necessary medium, as everything around us involves technology. The main aim of the TPACK framework is to enable teachers in the use of technology. One aspect that Mishra and Koehler (2006:1018) want to point out is to not only look at technology in education but rather at “how it is used”. There needs to be a greater effort in educating teachers on how to use technology in their pedagogy and “introducing technology to the educational process is not enough” (Mishra & Koehler, 2006:1018). The “what” to teach has been established quite well, it is the “how” that needs more attention (Mishra & Koehler, 2006:1018).

The authors above add that there is a gap between “theory and application” in education, hence the need for the TPACK framework (Mishra & Koehler, 2006:1019). The TPACK framework’s main aim is to provide a guide, like a map, to “why the world is the way it is” (Herring *et al.*, 2016:4). Many state that the TPACK framework is in fact a product of ‘zeitgeist’ in terms of this technological uprise, and it is a “product of timing” to equip teachers in the use of technology (Herring *et al.*, 2016:2).

There are three main aims of the TPACK model which are firstly for it to be descriptive in providing teachers with a way to include technology in their pedagogy (Herring *et al.*, 2016:4; Mishra & Koehler, 2006). Secondly, for it to be inferential which means that it helps us to generate inferences about our life and world around us to see where changes need to be made “to make predictions and inferences about contexts under which such good teaching will occur” (Mishra & Koehler, 2006:1045). Thirdly, to use technology effectively in the application of technology in “the real world” (Mishra & Koehler, 2006:1045). The TPACK enables us to investigate methods and approaches “toward developing teacher knowledge” to improve learning environments as well as opening up a new field of scholarship in the investigation of teaching environments (Mishra & Koehler, 2006:1045).

The TPACK framework is, therefore, a structure to describe the “interplay between technology, pedagogy, and content” (Herring *et al.*, 2016:4). This is what this research study aims to do. It aims to determine how pre-service EFAL teachers use technology effectively in their lesson preparation as well as in their teaching environment.

1.4 Research questions

1.4.1 Primary research question

The primary research question of this study is: How do pre-service English First Additional Language teachers use their digital competencies in planning and presenting lessons?

1.4.2 Secondary research questions

1. What are pre-service teachers' understanding and conception of technology?
2. How do pre-service teachers adopt the use and incorporation of technology in their lesson planning and presentation?
3. How can pre-service teachers ensure that a teaching moment is included in their EFAL lessons using the TPACK model?

1.5 Aims and objectives of the research

1.5.1 Primary aim

To determine how pre-service English First Additional Language teachers use their digital competencies in lesson planning and presentation.

1.5.2 Objectives

1. To determine what pre-service teachers' perception of technology is.
2. To determine how pre-service teachers adopt the use and incorporation of technology in their lesson planning and presentation.
3. To determine how pre-service teachers can ensure that a teaching moment is included in their EFAL lessons using the TPACK model.

1.6 Research methodology

1.6.1 Research paradigm

In this research study, a participatory action learning and research (PALAR) paradigm was followed due to its holistic and transformative approach to solve a practical problem which is experienced by partakers in every-day life (Wood, 2019:3; Zuber-Skerritt, 2015:10). The research aim focuses on how to determine how pre-service English First Additional Language teachers use their digital competencies in lesson planning and presentation. The best method to find a practical solution to a practical problem is to involve active partakers to be part of the solution.

PALAR ensured this in a participatory paradigm and enables the research participants to collaborate and work towards one unified goal in the research group (Wood, 2019:4).

1.6.2 Theoretical framework and the PALAR process

The theoretical framework that was followed in this research project was the conceptual framework of the figure eight process that was originally designed by Zuber-Skerritt (2013) and later adapted by Wood (2019). This process involved a continued and reflective approach to going back and forth in the small group which consisted of one researcher and six third-and-fourth-year pre-service teachers to answer the question of how pre-service English First Additional Language teachers use their digital competencies in planning and presenting lessons.

The first step was to convene and start building a relationship, as relationship building in the PALAR methodology plays a crucial role (Wood, 2019:33). During the first step, the participants of the small group needed to collaborate on a vision for the research project (Wood, 2019:133). The next step in the process was to ensure that all the participants had the same purpose for this research project, and that personal development occurs throughout the project (Wood, 2019:133). The team was then officially formed, and we did a context analysis where we set broad goals for the project (Wood, 2019:133-134). We discussed the ethical agreements in order for all the participants to know what the specific ethical components entail (Wood, 2019:135). After this, we set the research questions, determined the research methods, and discussed the development of research skills where the action plan was created (Wood, 2019:135). We then continued to make use of photovoice, graphic organisers, group discussions, reflective journaling, and fishbone analysis to collect data (Wood, 2019:135). Finally, we decided that the data will be analysed using *ATLAS.ti* and then reflection on the learning and development of the participants took place (Wood, 2019:135). These steps were then repeated to get to a point of saturation.

1.6.3 Research methodology

1.6.3.1 Data generation strategies, population, and sampling

An independent person, not involved in the study, was used to post an infographic about the research project on the third and fourth-year sites of the Learning Management System (LMS) of the university after access was granted by the relevant lecturers of these modules. The third and fourth-year students who were interested in taking part in the project, then scanned the QR code or clicked on the link on the infographic which led them to a Google Forms which they had to complete. I, the researcher, then collected these results and contacted the third and fourth-year

students and formed a WhatsApp group where we started with step one of the figure eight process.

1.6.3.2 Data generation techniques and data analysis

In this research project, group meetings were held and the group discussions that were held on Microsoft Teams, were transcribed. These verbatim transcriptions were used to do thematic coding using *ATLAS.ti*. The group discussions were also recorded. Another data generating technique that was used, was photovoice. The participants sent photos with captions that were used to code using *ATLAS.ti*. In the group sessions, we did a fishbone analysis to determine the causes of why pre-service teachers do not use technology effectively during their lesson preparation and presentation. With this, the effects of these causes were addressed and added to the fishbone analysis. Additionally, the group created a graphic organiser to determine what resources pre-service teachers have available in South Africa. The fishbone analysis and graphic organiser were coded using *ATLAS.ti*. During every group discussion, all the participants took part in collaborative ice-breaker activities to build relationship and trust during the course of this research project. All the artifacts that were created during the ice-breaker activities were used to analyse and code using *ATLAS.ti*

1.6.4 Ethical considerations

During this research project and the negotiation of the ethical agreement, respect for each other and their opinions was stressed. This included the data that was shared on the group, the contact information of each participant, as well as their views and opinions. The beneficence of this research project was to ensure that no harm was done to any of the participants during the research process (Manzo & Brightbill, 2007:34; Wood, 2019:113). Another ethical consideration was to ensure that all the participants were treated equally in terms of race, gender, ethnicity etc. (CREO, 2015; Manzo & Brightbill, 2007:33; Wood, 2019:114). Additionally, I applied for ethical clearance at NWU-EMELTEN-REC and received permission to continue with the research with the ethical clearance number: NWU-01058-21-S2. I also applied for gatekeeper permission at the Research Data Gatekeeper Committee and received permission to commence with research with the Gatekeeper approval number: NWU-GK-22-010.

1.7 Summary

In this chapter, an overview of the research project has been provided. The background and problem statement indicated that there is a need to investigate pre-service teachers' perceptions

regarding the use of technology in their lesson preparation and presentation, as well as how they use and incorporate technology in their lessons, and how they can use technology effectively while still ensuring that the teaching moment is included in their lessons.

CHAPTER 2 CHAPTER 2 TPACK IN TEACHING ENGLISH AS SECOND LANGUAGE

2.1 Introduction

In the article, *Those who understand: Knowledge growth in teaching*, Shulman (1986) criticises George Bernard Shaw's infamous statement that says "[h]e who can, does. He who cannot, teaches." He refers to this statement as one of the most "plagued" phrases and asks who Shaw is to criticise a whole profession and be taken as the final opinion on the purpose of teachers. Later in his article, he states that if teachers do not know their subject matter and how to teach the subject's content to their learners, the statement made by Shaw might as well be taken as the truth, resulting in the phrase to be changed to "[h]e who cannot, but know some teaching procedures, teaches" (Shulman, 1986:5). This is the result if teachers do not have the necessary pedagogical content knowledge. Years after Shulman (1986) made these statements, the task and purpose of the teacher is still the same. The context teachers find themselves in became more digitalised, but the basis of teaching still remains one that is of good pedagogical content knowledge. Mishra and Koehler (2006) took Shulman's notion on PCK and added a technological aspect to create the TPACK model. In this chapter, attention will be given to EFAL lesson planning, digital literacy, digital competence, pre-service teachers' perceptions regarding technology, and the TPACK model in lesson planning and presentation.

2.2 The importance of language in teaching and learning

It is quite often found that prospective teachers aspire to be the best teachers they can be. However, it is observed that anxiety often takes hold of pre-service, in-service and also experienced teachers' hearts, often due to a lack in knowledge about language (KAL) (McNeill, 2005). In many cases, this KAL usually has directly to do with grammar in second language classrooms (L2) (McNeill, 2005). McNeill (2005:159) makes an important statement regarding teachers' involvement with lesson content, and states that "the extent and adequacy of L2 teachers' engagement with language content in their professional practice is a crucial variable in determining the quality and potential effectiveness of any L2 teacher's practice". When applying this to the context in South Africa, this statement is very true (Jordaan, 2011), but another aspect needs focus: the literacy levels of the learners. According to the Progress in International Reading Literacy Study (PIRLS) results, South African learners are on a much lower literacy level than is expected for them to develop adequately. The PIRLS was developed in 2001 and is done every five years. In 2016, South Africa was the country with the lowest reading literacy score out of 50

countries (PIRLS, 2016). According to the TIMSS (Trends in International Mathematics and Science Study), which is conducted every four years, South African learners achieved the 56th place out of 58 countries in 2019 (TIMSS, 2019). The necessity of the TIMSS results is important, as mathematics and science are taught through English as the LoLT in many South African schools. English as an additional language means that due to the diverse context of South Africa, learners are exposed to more than one language, where English is often an added language and not necessarily a second language (Reyneke, 2014:32-33).

For many of the learners in South Africa, English is a second or even third language. In both the PIRLS and TIMSS reports, three main problem areas were identified that hinder learners to perform the best they can due to the impact of limited instruction: learner attributes, learner attendance, and learners who feel hungry (PIRLS, 2016). According to the PIRLS results, learners receive on average 156 hours in a year of reading instruction time as well as 242 hours of language instruction a year (PIRLS, 2016). It can be difficult for teachers to find the time and opportunity to effectively include reading instruction time, as curriculums are loaded to maximum capacity to ensure optimal covering of content (Mentz & Mentz, 2003:193). Together with this, there are 92% to 93% of learners in New Zealand and Denmark involved in computer-based activities, whereas 6% to 8% of learners in South Africa have access to computer-based activities (PIRS, 2016). It can be seen in the PIRLS results that Denmark achieved the 18th position and New Zealand ended up 33rd in the world. Considering these results, it is evident that there is a crisis at hand in South Africa and teachers are expected to look to new ways to solve these problems and help the learners to achieve the best they can. The language literacy level of learners is important to know, because it forms part of the learners' context, and teachers need to keep the context in mind when teaching EFAL (Rosenberg & Koehler, 2015; Uys *et al.*, 2020).

2.2.1 EFAL lesson planning

For learners to receive quality education that is on par with other countries in the world, teachers must also be adequately trained to be able to successfully teach learners. This involves being competent in language, technology and other aspects like lesson planning. Lesson planning is paramount in teaching, and this already starts in the minds of teachers. Planning in itself entails a sort of "psychological processes in which a person visualizes the future" to show the way for the actions that will be done in the next lesson (Clark & Peterson, 1984:23). There are many ways of lesson planning and many templates have been designed over the years. A 'one-size-fits-all' lesson plan does not exist, but teachers can ensure that the necessary alignment present in their lesson plans by incorporating the necessary aspects that are needed in a lesson as Vesely *et al.* (2007:236) suggest. Among the seven principles that are provided for good teaching practice

by Vesely *et al.* (2007:236), are the encouragement of “contact between students and instructor”; the development of “reciprocity and cooperation among students”; the encouragement of “active learning”; giving prompt feedback; placing emphasis on the time that is available for a task; communicating high expectations; and respecting “diverse talents and ways of learning” (Versely *et al.*, 2007:236). Uys *et al.* (2020:20) suggest the cyclic lesson plan to make sure teachers cover these aspects. Additionally, many teachers need help with lesson planning, as Bigelow and Ranney (2005:180) observed, that it is difficult for pre-service teachers to transfer KAL to learners, causing this transfer not to be seen in many pre-service teachers’ lesson planning. It is, therefore, necessary to focus lesson plans and classroom environments to learn language through “meaningful, communicative and experiential content instruction” (Bigelow & Ranney, 2005:180). This meaningful instruction of integrating content and language already starts at the planning level. Like with everything, planning simply put “creates better lessons” (Uys *et al.*, 2020:19). In the research done by Clark and Peterson (1984:10), they identified three main areas of teachers’ thought processes: teachers’ planning which includes their “preactive and postactive thoughts”, their “interactive thoughts and decisions” and lastly their “theories and beliefs”. Lesson planning, or as Clark and Peterson (1984:15) state, “teacher planning”, can be defined as the ideas, planning and “thought processes teachers engage in prior to classroom interaction” (Clark & Peterson, 1984:15).

Planning, therefore, refers to the time and efforts put in before a lesson commences. Lesson planning also includes teachers’ reflection after a lesson took place in order for them to include what new content and methodological knowledge they have gained into future lessons (Ball *et al.*, 2007:56; Clark & Peterson, 1984:15). This interaction between the different areas as seen in Clark and Peterson’s (1984) framework for teachers’ thought processes is described as “bidirectional” by Ball *et al.* (2007:57), in the sense that it acts as an interactive and ongoing process during teachers’ planning phase. Clark and Peterson (1984:16) claim that this process is a cyclical process that often results in the clarity between the different thought process areas becoming “blurred”, and teachers lose track of which actions are preactive and which are proactive. Another aspect that greatly affects teachers’ lesson planning is their “theories and beliefs” (Clark & Peterson, 1984:16). This involves the views, principles, ideas, understanding as well as teachers’ judgement (Clark & Peterson, 1984:17). This corresponds with the backwards design lesson wheel that is suggested by Reyneke (2014) as well as Uys *et al.* (2020). The most important aspect to remember is that these views, principles, ideas, understanding, judgement, theories and beliefs all play an important part in the planning phase, and that the planning phase occurs before teaching can take place (Wiggins & McTighe, 2011:7). Effective lesson planning by teachers also results in utilising the teaching opportunity and enhances learners’ learning

experience, which will prove that learning has taken place during the teaching phase (Uys *et al.*, 2020:19; Wiggins & McTighe, 2011:7). Additionally, when lesson planning is done correctly, teachers will be confident to present the lesson content and manage the class more effectively, because proper preparation has been done before the commencing of the lesson (Clark & Peterson, 1984; Uys *et al.*, 2020:19).

This proper preparation, according to Wiggins and McTighe (2011:8), include three most common steps teachers follow when they plan their lessons. These steps are part of the 'backward design' which was also adapted by Uys *et al.* (2020) at the Faculty of Education of the North-West University. These initial basic steps include identifying the desired results, "determine acceptable evidence" and "plan learning experiences and instruction accordingly" (Wiggins & McTighe, 2011:8). These three basic stages of planning can lead to teachers avoiding committing what is called the "twin-sins of planning and teaching" (Wiggins & McTighe, 2011:8). The first *sin* occurs in the Foundation and Intermediate Phases where teachers are mostly concerned with their own child-friendly teaching performance rather than focusing on creating coherent and aligned learner activities (Wiggins & McTighe, 2011:8-9). The second *sin* occurs in the senior and FET phase where teachers race to cover the prescribed content to cover the content-based outcomes and blindly "march" through textbooks and school resources to achieve the goal (Wiggins & McTighe, 2011:9). Wiggins and McTighe (2011:9) further claim that it is necessary for the teacher to not only "cover" the content but to "uncover" the interesting facts and knowledge through the proper planning of activities during a lesson.

The cyclic backward design suggested by Reyneke (2014) and Uys *et al.* (2020) as the *lesson wheel*, can be used by pre-service teachers who are still learning to design lessons to ensure that all the key elements are included in the lesson plan, as well as by experienced teachers who want to keep their standards of good lesson planning and to ensure that their lessons are aligned. The lesson wheel consists of two-disc sides. One is the planning side and the other the presentation side (Reyneke, 2014). When planning a lesson, the lesson wheel guides teachers to first consider the context of the learners, the available time and the learner profile before continuing the planning process (Reyneke, 2014; Uys *et al.*, 2020). Then the planning starts with a white section, which prompts the teacher to start the planning process with the end goals in mind. The end goal is to know what is expected in the curriculum and to carefully read through it to ensure that the outcomes are kept in mind as the planning of the lesson progresses (Reyneke, 2014; Uys *et al.*, 2020:26). The next section in the lesson wheel is the blue segment which leads the teacher to design a main objective or SMART task (Reyneke, 2014; Uys *et al.*, 2020:30). The SMART task is a task that is designed to be the "evidence" at the end of the lesson that learning has occurred

(Reyneke, 2014; Uys *et al.*, 2020:30). The ‘S’ in SMART stands for *specific*, and this means that the task is described in such a way that it explicitly states what is expected of the learner in the task, while the ‘M’ stands for the task being *measurable*, which means that the task contains a higher-order thinking verb according to Bloom’s taxonomy, describing the action that should be taken to complete the task (Uys *et al.*, 2020:26; Wilson, 2016). The ‘A’ stands for *attainable*, which refers to “potential of the learners, time constraints and available resources”, while the ‘R’ stands for *relevant*, referring to the content of the task being relevant to the learners’ learning experience (Uys *et al.*, 2020:30). Finally, the ‘T’ stands for *traceable*, “both as a process and as a product” (Uys *et al.*, 2020:30).



Figure 2-1: The lesson wheel segments (Uys *et al.*, 2020:24)

The next step in the planning phase is the orange section, which aims to guide the teacher to plan the assessment methods and tools that will be used in the lesson to ensure optimal learning to take place (Reyneke, 2014; Uys *et al.*, 2020:35). Then there is the red section, which focuses on the learner activities and tasks, leading the teacher to create three scaffolded activities according to Bloom’s taxonomy that are aligned with the SMART task to enable and equip learners to do the SMART task on their own without assistance (Reyneke, 2014; Uys *et al.*, 2020:41; Wilson, 2016). The next section is the turquoise segment, which focuses on the planning for explicit instruction. This is the teaching moment in the lesson (Reyneke, 2014; Uys *et al.*, 2020:43), which is aligned with the lesson outcomes, SMART task, and learner activities to ensure that explicit

instruction occurs to teach the learners the new content of the lesson (Reyneke, 2014; Uys *et al.*, 2020:43). Next, the yellow section guides the teacher to consider and choose the resources that will be used during the lesson (Reyneke, 2014; Uys *et al.*, 2020:45). The purple segment allows the teacher to plan the introduction of the lesson, where the main aim is to activate learners' prior knowledge on the content that will be taught in the lesson (Reyneke, 2014; Uys *et al.*, 2020:43). Finally, the pink segment prompts the teacher to plan the pertinent questions that will be asked at the beginning of the lesson; these are open-ended questions linking the content of the lesson with real-life examples and situations outside the classroom to show the learners the reason why the content they are being taught is necessary and important, and to create interest (Reyneke, 2014; Uys *et al.*, 2020:48).

Once the planning is done, the teacher can turn the lesson wheel around and follow the segments from the pertinent question back to the introduction, resources, teaching moment, learner activities, and SMART task (Reyneke, 2014; Uys *et al.*, 2020:50). In Figures 2-1 and 2-2, the lesson wheel can be seen.

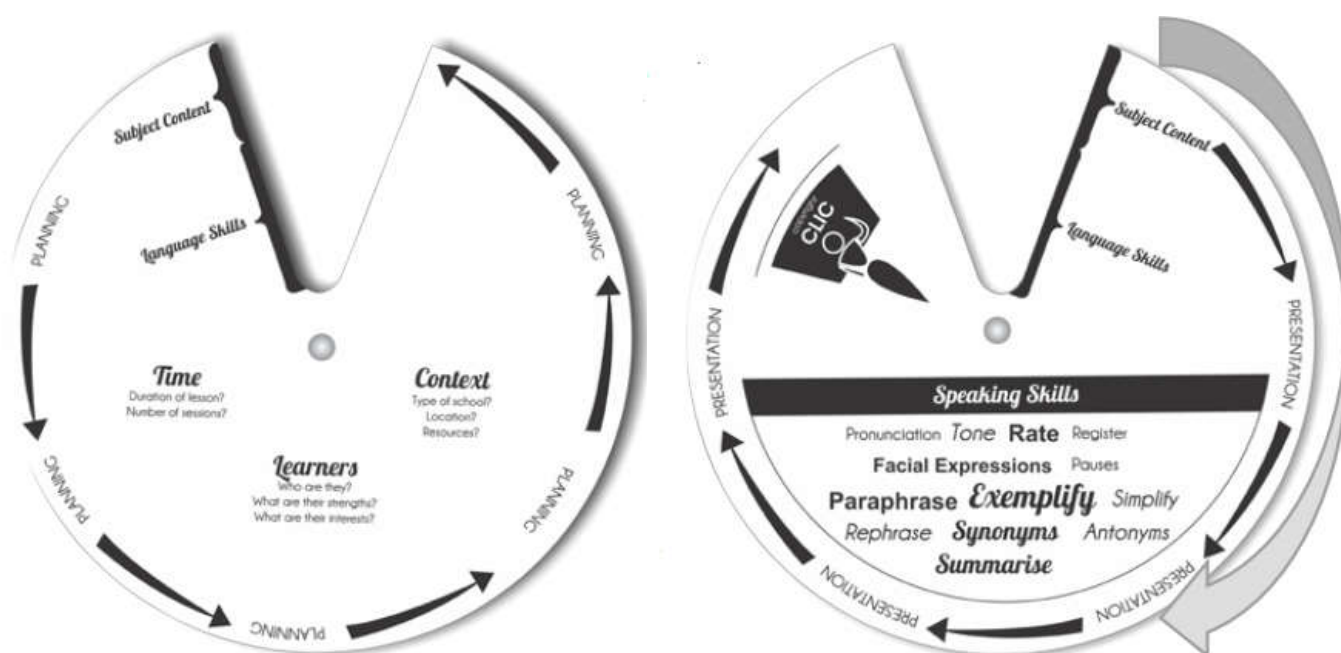


Figure 2-2: The outer planning and presentation discs of the lesson wheel (Uys *et al.*, 2020:23-25)

Together with the use of a good lesson plan, multiple resources including technology can help learners and teachers make the most of the learning experience. There are ample possibilities

and many advantages to using technology during the lesson planning and lesson presentation phases. Therefore, it is necessary to address the perceptions of pre-service teachers' understanding of technology.

2.3 Digital literacy vs digital competency

Confusion exists about the terms 'digital literacy' and 'digital competency'. Many researchers and other interested parties see these two terms as synonymous. Godhe (2019) postulates that many English-speaking countries tend to agree that these terms are synonymous, whereas other European countries tend to argue that these terms refer to two different concepts. Godhe (2019) also states that the Nordic countries see these terms as different and in this research study, these terms are also seen as two different concepts. The simple reason for this is that the word 'literacy' refers to the ability to read and write (Godhe, 2019; Oxford Dictionary, 2010:869). When looking at the term 'computer literate' in the Oxford Dictionary (2010:297), it can be seen that the concept means to be "able to use computers well". When considering the word 'competency', it can be seen that it refers to the ability to do something well or "to the necessary standard" (Oxford Dictionary, 2010:293). The Department of Basic Education (2018:6) defines "digital literacies" in the Digital Learning Framework guidelines as the involvement of "various types of literacy associated with learning in a digital society", which include "digital or ICT literacy, information literacy, media literacy and digital citizenship". In this study, digital literacies will refer to the basic skills (Godhe, 2019:27) needed to use programs in lesson preparation and presentation during explicit teaching moments, such as Microsoft Word, Excel, PowerPoint, as well as online platforms such as Padlet, Trello, Powtoons, etc. Being digitally literate results in teachers having a better understanding of how to use technology and incorporate it in lesson preparation and presentation processes. It is necessary to note that digital literacy is different than digital competencies. For the purpose of this research study an overview of digital learning competencies is also provided.

2.3.1 Digital literacy

As stated above, literacy refers to the ability to read and write in an educational context. Godhe (2017:26) highlights the fact that reading and writing in language learning involves the deciphering, copying and memorising of content that is being read. The content that is being read in the past was found in printed text forms like hardcopy books, newspapers, letters, etc. Nowadays, these texts are found in digital form as well. For example, books take the form of e-books in different formats (e-pub, PDF, Kindle, etc.) and letters are read and written in email, blogs, social media and other digital platforms. These digital platforms are available on

technological devices such as cell phones, computers, laptops, tablets, and even smart television sets. This shift in availability of content brought new concepts to light. Hence the term digital literacy. Digital literacy, therefore, refers to the “skills such as being able to handle the digital devices when communicating online” (Godhe, 2017:26). Being digitally literate involves “being skilled at deciphering complex images and sounds as well as the syntactical subtleties of words. Above all, it means being at home in a shifting mixture of words, images and sounds” (Lanham, 1995:200). This skill set enables teachers to work comfortably with digital devices and platforms, and these skills become part of a teacher’s digital competency (Lanham, 1995).

2.3.2 Digital competency

As times changed to a more digital era, more and more frameworks, models and methods are introduced to help guide teachers to become more equipped when using and working with technology (Falloon, 2020:2449). Digital literacies were defined as the skills we need to be able to work with digital devices and tools. Digital competency is somewhat different from digital literacy, and refer to the broader sense of knowing how to use technology in “many aspects of life”, which includes work, leisure and communications (Janssen *et al.*, 2013:473). Digital competency is one of the Eight Key Competencies for Lifelong Learning as described by the European Parliament and the Council, and it is defined as

the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet. (European Community, 2007:7).

In countries like the United States of America, there are only one semester-long course that focuses on teaching pre-service teachers how to teach using technology that can be found at universities (Foulger *et al.*, 2017:416). In South Africa, very little attention is given to technology training courses in pre-service teacher curriculums. Often some aspects of technology are included in content subjects with a few assignments that require the use of technology, but there is a lack in technology-focused modules that teaches pre-service teachers how to teach using technology (Dlodlo, 2009:170; Herselman, 2003:948). Foulger *et al.* (2017) claim that it is necessary to integrate technology and align it with content subjects such as Science and Mathematics and adds that teacher training programs, as opposed to computer programs, should focus more on infusing technology into programs that “provides a more concerted effort to address teaching with technology throughout the curriculum” (Foulger *et al.*, 2017:416). In the Professional

Development Framework for Digital Learning that was designed by the Department of Basic Education in South Africa, there are 10 basic competencies a beginner teacher needs to have. Amongst the listed competencies, there is only one focusing on digital competence, which states “have highly developed literacy, numeracy and Information Technology (IT) skills” (Department of Basic Education, 2018:13). For beginner teachers to be able to have these digital literacy and competence, they must be explicitly trained at university level to be able to apply these skills in practice.

2.4 Understanding and conceptualising technology

Using technology as a valuable resource in the classroom instruction is not a new concept. Verloop (1989) asked questions about teacher training programmes and whether more can be done to make learning more interactive and meaningful as far back as 1989. Verloop (1989) suggested using video tapes in classrooms to promote interactive lessons and convey messages to pre-service teachers, which will help them to introduce the new content in context for better understanding during teacher training programs. There are numerous advantages to the use of technology in the EFAL classrooms and the opportunities for interactive and meaningful learner engagement are endless. With the use of technology in classrooms, learners can have access to content they do not often see or experience and see different cultures, places and projects all over the globe, as well as develop their critical thinking and problem-solving skills and gain exposure to multiliteracies (Corkett & Benevides, 2015:35; Oh & French, 2001:2). The term multiliteracies was coined by the New London Group in 1996 with the main aim of “students benefit[ing] from learning in ways that allow them to participate fully in public, community, and economic life” (Cazden, Cope, Fairclough & Gee, 1996:60). This means that pedagogies need to change. Cazden *et al.* (1996:60) view pedagogy as “a teaching and learning relationship that creates the potential for building learning conditions leading to full and equitable social participation”. Kress (2010) also did research on multiliteracies when he published his book *Multimodality*. Other researchers in this field are Norbert Pachler, John Cook, Ben Bachmair and more recent researchers include Nicola Yelland. The multimodal process refers to a “slowmation” which is abbreviated from slow animation (Jablonski, Hoban, Ransom & Ward, 2015:5). During this process, learners get the opportunity to represent what they understand of specific subject content (Jablonski et al., 2015:5). In the multimodality process, digital resources are used to determine whether learners can represent their knowledge (Jablonski et al., 2015:5). Pachler (2007:13) defines multimodality as “digital technologies that allow content to be presented using a diverse range of systems of representation and a combination of different semiotic means of meaning-making”.

In the midst of all the advantages of the use of technology in the EFAL classroom, pre-service teachers experience a certain perception around technology and the use of technology in the classroom (Corkett & Benevides, 2015:35). Among these perceptions, Teo *et al.* (2016) identified five different perceptions held by teachers regarding the integration of technology into instruction. The first perception is the idea that the use of technology would be easy, which means that if teachers think technology is too complicated to use in the integration into classroom instruction, they will tend to avoid the use of it all together (Teo *et al.*, 2016:6). The second perception is the idea that technology is useful, and those teachers believe that technology will improve their “performance”. They therefore tend to use it more (Teo *et al.*, 2016:5-6). The third perception is the “subjective norm” regarding the use of technology, which refers to the idea that it is expected of teachers to use technology by the people they deem as important (Teo *et al.*, 2016:7). The fourth perception is the indirect impact of “facilitating conditions”, which means that technology is incorporated more by teachers if they think there is the necessary support system available to help them in their efforts to use technology in their instruction (Teo *et al.*, 2016:7). The fifth and last perception is the idea that using technology is more complicated for female users than male users (Teo *et al.*, 2016:8).

Moreover, pre-service teachers have the perception that using technology during their lesson planning and presentation will take more of their time (Asan, 2002:226; Beschorner & Kruse, 2016:258). Additionally, a factor that influences the perception regarding the use of technology during the teaching moment in classrooms, is greatly due to the different socio-economic settings teachers find themselves in. Teachers in developed countries ask different questions regarding the use of technology than teachers in developing countries. Teachers in developed countries ask “how” technology can be used, whereas teachers in developing countries ask “whether” technology should be used (Skenderi & Skenderi, 2017:213). Even though many of the current pre-service teachers are part of the ‘digital natives’ generation who grew up with technology as coined by Prensky (2001), there are still perceptions that technology cannot be incorporated effectively (Hesseini & Kamal, 2013:1; Teo *et al.*, 2016).

Additionally, being born in the technology era does not necessarily mean that the skills of teaching while using technology is an automatic trait for pre-service teachers of this era (Hosseini & Kamal, 2013:1; Silverstein *et al.*, 2000). Merely having computer skills is also not enough to successfully integrate technology into instruction, and constant revision of educational practices is necessary to ensure that the integration of technology into classroom instruction occurs effectively (Hosseini & Kamal, 2013:1; Lee, 2002). To support this notion, Akkaya (2016) reported that there was a significant change in teachers’ perspectives regarding the integration of technology into

instruction after mathematics teachers received training through a teacher training program which also supports the five perceptions, as Teo *et al.* (2016) mention. The conclusion can therefore be made that teachers need more support and training before they will be positive about and willing to use technology in classroom instruction. These training programs affect the digital literacy and competency of pre-service teachers.

2.5 TPACK in lesson planning

The Technological Pedagogical Content Knowledge (TPCK) framework was designed by Mishra and Koehler (2006). This framework is solely based on Shulman's seminal work on the Pedagogical Content Knowledge (PCK) notion. The initiative to create such a framework is based on Shulman's (1986:9) statement that many resources and ways of transferring the subject matter to learners need to be utilised in order to make it "comprehensible to others". Technology was therefore added to the term, PCK, in order to use it to create a platform that will aid in making subject matter comprehensible to learners (see the illustration in Figure 2-3). Mishra and Koehler (2006:1023) claim that the use of technology provides "a range of representations, analogies, examples, explanations, and demonstrations that can help make subject matter more accessible to the learner". It is important for a teacher to be able to make decisions on what technology can be used and in what way to facilitate learning. Therefore, a teacher needs to have knowledge about technology and how it can be used to teach specific content.

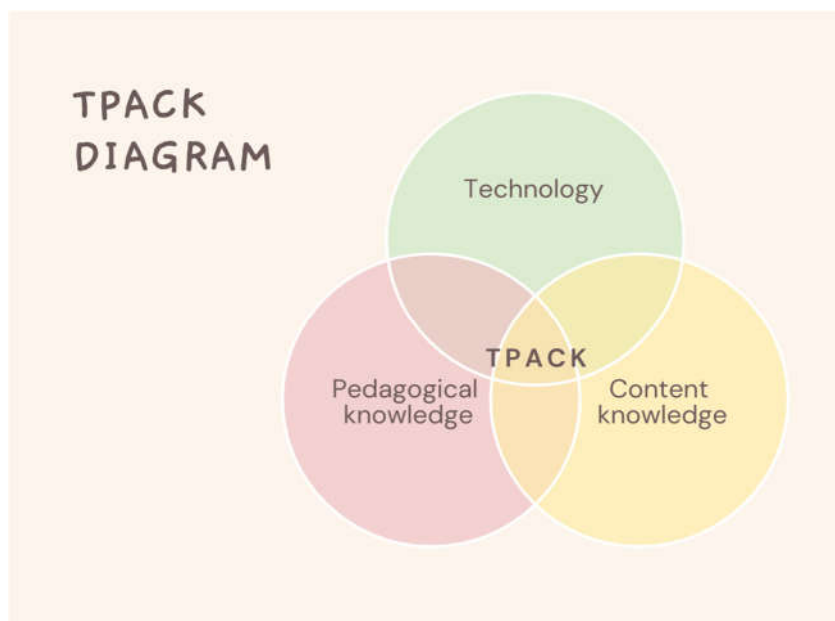


Figure 2-3: Venn diagram of the TPACK model (Mishra & Koehler, 2006)

2.5.1 Content knowledge (CK)

Content knowledge is known as the “amount and organization of knowledge per se in the mind of the teacher” (Shulman, 1986:9). Additionally, Shulman (1987:8) states that content knowledge is the “knowledge, understanding, skill, and disposition that are to be learned by school children”. According to Shulman (1986:9), content knowledge consists of three categories, which are subject matter knowledge, pedagogical knowledge and curricular knowledge. Shulman (1986:9) further states that it is necessary to think about content knowledge in different ways, as knowledge on content “requires going beyond knowledge of the facts or concepts of a domain”. When it comes to the teacher’s content knowledge, Shulman (1987:9) claims that it is necessary for the teacher to have a “broad liberal education that serves as a framework for old learning and as a facilitator for new understanding”, and not just an understanding of the subject that is being taught by the specific teacher.

2.5.2 Pedagogical knowledge (PK)

Pedagogical knowledge refers to the “generic principles of classroom organisation and management” (Shulman, 1986:14). Akbari and Dadvand (2013:13) claim that teachers’ pedagogical belief systems “function as a benchmark for educators’ classroom decision-making”. Shulman (1987:15) states in his model of pedagogical reasoning and action that teachers need to have the necessary comprehension of what they are teaching; transform in terms of preparation, representation, selection, and adaptation of conceptions and how it can be taught; manage their instruction techniques; evaluate their learners’ learning; and reflect on the effectiveness of the instruction techniques they applied in the class.

2.5.3 Technological knowledge (TK)

Technological knowledge is the knowledge pertaining to a “person’s understanding of the function and operation of currently available technology and applications on that technology (Woo Dong Yu & Golden, 2019) and leads to a person’s digital competence and digital literacy.

2.5.4 Technological content knowledge (TCK)

The technological content knowledge in the TPACK framework by Mishra *et al.* (2013) is based on Shulman’s (1986:9) work on content knowledge. This means that all the principles addressed

under CK is followed with the inclusion of effective teaching with technology (Mishra *et al.*, 2013:13).

2.5.5 Technological pedagogical knowledge (TPK)

The technological pedagogical knowledge in the TPACK framework by Mishra *et al.* (2013) is based on Shulman's (1986; 1987) work on pedagogical content knowledge. This means that all the principles addressed under PCK is followed with the inclusion of effective teaching with technology using digital technologies such as computers, cell phones, tablets, software applications and programs, as well as internet (Mishra *et al.*, 2013:13).

Additionally, lesson planning has been defined as the ideas, planning and “thought processes teachers engage in prior to classroom interaction” (Clark & Peterson, 1984:15). Planning, therefore, refers to the time and efforts put in before a lesson commences. This planning phase involves many aspects. When following the backward design by Uys *et al.* (2020), lesson planning and preparation must be done on interpreting the curriculum, designing the SMART² task, assessment methods for activities, designing learning activities and tasks, creating an explicit teaching moment, finding suitable resources and how to use them, design an introduction, and formulating the pertinent question.

The main purpose of a teacher is to teach learners content and the lesson plan is focused on transferring the content to learners and making it understandable for them. It is, therefore, vital for teachers to have good content knowledge. Shulman (1986:9) defines teachers' content knowledge as “the amount and organization of knowledge per se in the mind of the teacher”. In this definition there are two important concepts, namely “organi[s]ation” and “knowledge” (Shulman, 1986:9). The organisation refers not only to the sorting of content knowledge in the mind of the teacher during lesson planning, but also to the planning that goes into a lesson before it commences. In the planning phase, the teacher needs to plan ahead and think of the different ways the subject matter can be explained to the learners in an understandable way, as well as why something is the way it is and why it is important to know this (Shulman, 1986:9). The other concept that Shulman (1986:9) uses is “knowledge”, which refers to the content knowledge the teacher has on the subject matter.

² A SMART task is a task that is **S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**raceable.

Moreover, during this planning process, technology can be a useful tool to incorporate and plan a lesson optimally, and this is where incorporating the TPACK model in lesson planning comes into play.

When looking at Figure 2-3 on the complete TPACK model, it is clear to see how pedagogy, technology and content knowledge overlap. Figure 2-4 focuses only on content knowledge and technological knowledge, whereas it zooms in to see the relation between technology and content knowledge. This area is what we are focusing on during the lesson planning phase.

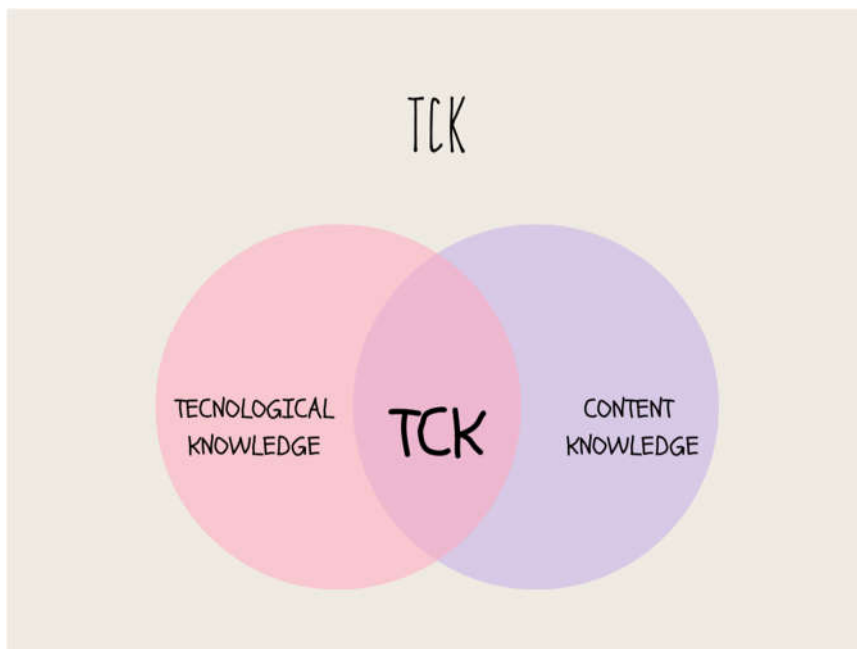


Figure 2-4: Venn diagram of the TCK model as part of the TPACK model (Mishra & Koehler, 2006)

While planning a lesson following the backward design by Uys *et al.* (2020), it is important to focus on the following aspects:

2.5.6 The context of the learners and teachers in South Africa

When planning and preparing for a lesson, the context of the learners and the teacher is an important factor to keep in mind (Rosenberg & Koehler, 2015:186). Shulman (1987:6) stated in 1987 already that “[c]ritical features of teaching, such as subject matter being taught, the classroom context, the physical and psychological characteristics of the students, or the accomplishment of purposes not readily assessed on standardized tests, are typically ignored in the quest for general principles of effective teaching”. One of the main reasons why context is so important for education in South Africa, is the nature of a diverse population with learners who are multilingual and come from different traditions and socio-economic statuses. In such a diverse country, it is almost impossible to design a one-size-fits-all model and to assume that everyone has access to technology in their classrooms. This counts not only for the learners, but also for the teachers who need to prepare their lessons as well. Many teachers in South Africa find themselves in settings with limited resources (Fleisch, 2008; Jordaan, 2011; Mentz & Mentz, 2003;).

Additionally, many learners and teachers struggle to meet the educational objectives due to poverty, the lack of basic needs, hunger, and poor teaching quality (Fleisch, 2008; Jordaan, 2011:80; Mentz & Mentz, 2002). The South African context differs from other countries like the United States of America, Australia and other developed countries in the sense that the country still needs to develop and put the necessary infrastructure for teaching in place (Mentz & Mentz, 2002). Among the obstacles that teachers and learners in a South African context face, is the lack of electricity, to name but one (Mentz & Mentz, 2002:193). It was a problem in 2002 and it is still a problem today. Many schools simply do not have an electricity connection and others who do, cannot use it due to constant load shedding or cable theft or cut electricity due to municipalities not paying their electricity bills.

Another barrier that is found in the South African context is poverty (Fleisch, 2008; Jordaan, 2011:80; Mentz & Mentz, 2002:193). This includes poor financial support from the Department of Basic Education to schools, as well as the socio-economic status of communities (Fleisch, 2008; Jordaan, 2011:80; Mentz & Mentz, 2002:193). If a school is privileged to have electricity and managed to get computers and internet, they are at high risk for theft (Mentz & Mentz, 2002:193). Another aspect that is applicable in the South African context, is the “unfavourable teacher-learner ratio (usually more than 1:30)” (Mentz & Mentz, 2002:193). Additionally, in a study done by Mashile (2016), 56,06% of teachers responded to agree to the statement “[t]he socio-economic divide is replicated by the digital divide”. This study was done 14 years later than the research

done by Mentz and Mentz (2002), which focused on the need of improvement of availability of digital resources in the South African context.

All these aspects affecting the context of learners and teachers can be found in as little as a 60km radius in Gauteng. There are schools who have a computer in every class and learners with a tablet in the classroom, whereas there are schools 60 km outside of Pretoria, for example, who do not have electricity, have class in a 2x2-m corrugated structure, with learners sitting on the floor and where schools need to find a way to have feeding schemes because learners come to school hungry. This is something I have experienced when visiting students at schools to assess their WIL practical lessons. This is but a measure of the diverse context that can be found in South Africa, and guidelines like those which can be found in the International Society for Technology in Education (2022) cannot be taken and applied to the South African context. Specialised and contextualised guidelines need to be provided for South African teachers and learners.

These aspects create a major barrier in incorporating technology in South African schools. Together with the diverse South African context comes the different levels of understanding that learners and teachers are on. Additionally, Rosenberg and Koehler (2015) acknowledge the importance of incorporating context with the TPACK model, and adapted the model to show how the context of learners and teachers underlies the TPACK model. This illustration can be seen below in Figure 2-5.

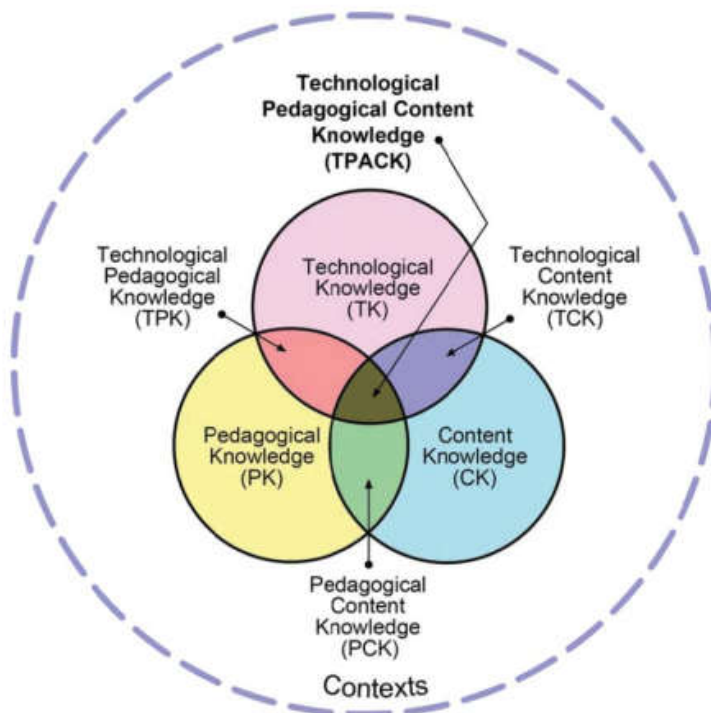


Figure 2-5: The TPACK model indicating the importance of context (Rosenberg & Koehler, 2015:187)

Rosenberg and Koehler (2015:188) stress the importance of including context in the TPACK model, and emphasises context by referring to the micro, meso- and macro levels with the teacher and learner being the actors affecting the levels of contexts. The *micro* factors refer to the direct classroom environmental factors like the organisation of the classroom and the layout of the tables (Rosenberg & Koehler, 2015:188). The *meso* factors refer to the factors that exist between the school environment and learners' learning environment outside the school (Rosenberg & Koehler, 2015:188). The *macro* factors refer to the "societal conditions that affect teaching, learning, and the development of teachers and learners" (Rosenberg & Koehler, 2015:188). These three contextual factors influence "social interactions, resources, scaffolds, and supports that affect teaching with technology" and "facilitates better understanding of the context around teachers' TPACK" (Rosenberg & Koehler, 2015:189).

2.5.7 Level of understanding of technology

The context in South Africa affects the level of understanding of teachers and learners regarding technology. Limited exposure to technology due to contextual factors leads to ineffective use and not enough knowledge on technology and how to use it in a classroom both for teachers and learners. In a study done by Mashile (2016:51), it can be seen that South African teachers are relatively positive about using technology in their lesson preparation, and even design Word documents and PowerPoint presentations. However, they feel that they still need more assistance and training regarding the use of technology (Mashile, 2016:53). These views are also supported by Herselman (2003). As seen in the South African context which was described, it is clear that learners who do not have access to technology will not develop the skills to work with technology.

2.6 TPACK in lesson presentation

Using the TPACK model in lesson presentation or instruction involves much more than simply using a PowerPoint Presentation or playing a YouTube video. It involves the creation of learning opportunities, the integration of lesson goals and outcomes, the incorporation of technology to promote meaningful learning opportunities, as well as using technology to enhance the development of critical thinking and problem-solving skills (Stone Wiske, Franz & Breit, 2005). Stone Wiske, Franz & Breit (2005:16) state that "time with learners is too precious to spend on activities without a clear and important educational purpose". In the TPACK model, the lesson presentation section entails the technology pedagogical knowledge (TPK) integration into a

lesson by the teacher. In Figure 2-5, the whole TPACK model can be seen and in Figure 2-6, the focus is on the technological pedagogical knowledge.

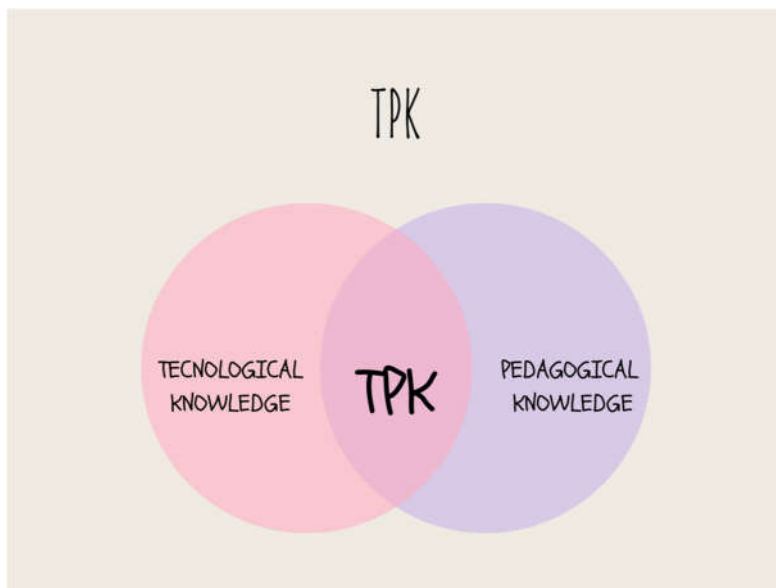


Figure 2-6: Venn diagram of the TPK model as part of the TPACK model (Mishra & Koehler, 2006)

In a study done by Hosseini and Kamal (2016:6), they indicated that pre-service teachers have a knowledge shortage on how to use technology during the teaching moment (TPK) in a classroom, mainly due to it being taught in isolation during their teacher training. The instructional phase in a lesson is also the phase where the teacher utilises the opportunity to teach learners new content. In 1953, Robert Havighurst coined the term *teachable moment*, and describes this as the moment in a lesson as:

“When a body is ripe, and society requires and the self is ready to achieve a certain task, the teachable moment has come. Efforts at teaching which would have been largely wasted if they had come earlier, give gratifying results when they come at the teachable moment, when the task should be learned.” (Havighurst, 1953:5)

The teaching moment is when the teacher uses a desired opportunity optimally to teach new content and make the most of this opportunity with the effective use of technology to support the learning outcomes and goals.

The TPACK model connects technological, content and pedagogical knowledge, which can by no means be removed from each other. Only for the purpose of this study with the two aspects of

lesson preparation and presentation, do I focus more on TCK and TPK individually to indicate how these two aspects fit into the research study.

The teaching moment links with the pedagogical content knowledge in the sense that the “most regularly taught topics in one’s subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations”, which is in other words the methods and techniques the teacher uses “representing and formulating the subject that make it comprehensible to others” (Shulman, 1986:9). In succeeding to do this with the use of technology, it is necessary to focus on helping pre-service teachers decide which technological platforms to use and look at the training pre-service teachers need at university level.

2.6.1 Deciding which technology to use in an EFAL lesson

One aspect that pre-service teachers need to be able to do in the rapidly changing classroom environment, is knowing which technological programs, applications and tools to use for which classroom activities (Lisa *et al.*, 2021; Mishra & Koehler, 2006:1018). In their research, Lisa *et al.* (2021:157) confirm that computer-assisted language learning (CALL) plays an important part of teaching English, and further claims that “teaching and learning should be aligned with technological development”. In this digital era, pre-service teachers need to be able to know which technological tools to use to teach speaking, writing, reading and listening. There are numerous opportunities and resources available to be utilised in an EFAL classroom, but without proper training, it can seem like finding a needle in a haystack for an EFAL teacher. Some aspects the pre-service teacher needs to keep in mind include the curriculum, learning objectives, learner characteristics and context, the resources that are available at the school, school-based support systems, and the budget the school has available (Lisa *et al.*, 2021:157).

There are some ways a pre-service teacher can ensure the technology he/she uses is applicable in an EFAL classroom. Hamilton (2018) suggests using technology that supports Bloom’s Taxonomy (Wilson, 2016). On the remembering level, Hamilton (2018) suggests using technology that includes online searches, writing facts in bullet form, and list events. On the understanding level, Hamilton (2018) suggests creating a flow chart, summarising a text, and sort the text into a diagram (like a Venn diagram) or presenting the information in a blog. On the applying level, learners can go onto a subject-specific website and choose images that explain a concept, conduct interviews using recorders, and even design a presentation (Hamilton, 2018). On the analysing level, technology can be incorporated using the internet to research a topic, develop a mind-map or diagram, develop a questionnaire, and even develop a spreadsheet (Hamilton,

2018). On the evaluating level, learners can write an essay on a computer, conduct online group meetings and sessions, and write an online book review (Hamilton, 2018). Lastly, on the creating level, learners can design logos or book covers, create a podcast on a topic and collaborate on a wiki.

These are all ways to incorporate technology into activities that are scaffolded according to Bloom's Taxonomy, but the teacher still needs to have the necessary knowledge regarding technology to be able to choose the applicable platform to use for the activity and guide the learners through the activity (Herselman, 2003:947). This is where the need arises of training pre-service teachers.

2.6.2 The SAMR model

The SAMR model provides four approaches in "selecting, using and evaluating technology" in classrooms (Hamilton *et al.*, 2016:1). These approaches aim more at a higher level of technology integration in classrooms (Hamilton *et al.*, 2016:1). The model (seen in Figure 2-7) shows how the teacher can select technology by starting at the substitution phase where technology is used, to be a tool that directly substitutes hardcopy resources without "functional improvement", while augmentation refers to the direct digital replacement of resources with "functional improvement" (Puentedura, 2013). These approaches are part of the enhancement phase which is responsible for the enhancement of resources by digitalising it (Puentedura, 2013). The next two approaches are part of the transformation phase and include the modification approach where technology is used to make significant changes in the tasks and resources, while redefinition results in a total recreation of new tasks which were "previously inconceivable" (Puentedura, 2013).

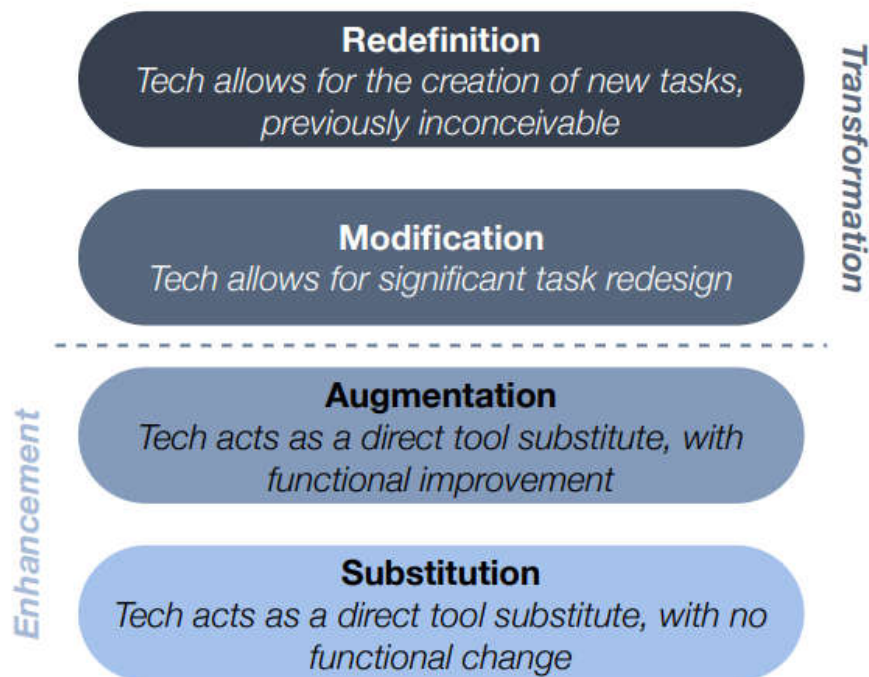


Figure 2-7: The SAMR model (Puentedura, 2013)

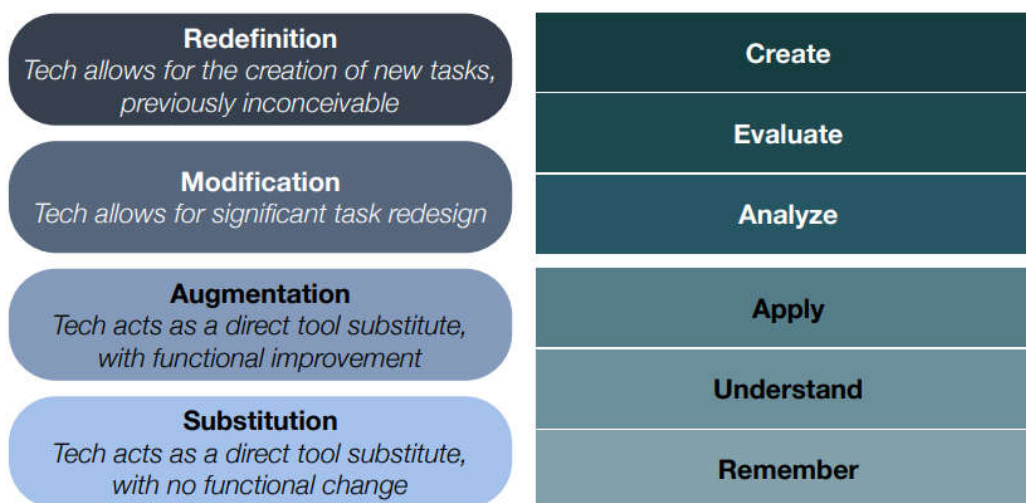


Figure 2-8: The SAMR model with Bloom's Taxonomy (Puentedura, 2014)

In Figure 2-8 it can be seen how the SAMR model fits with the levels of Bloom's Taxonomy. It can also be seen how the first two approaches fit with Bloom's three lower thinking levels, while the two approaches that focus on transformation link with the three higher order thinking levels (Puentedura, 2014).

Figure 2-9 shows how the SAMR model can be used and provides practical examples in the classroom.

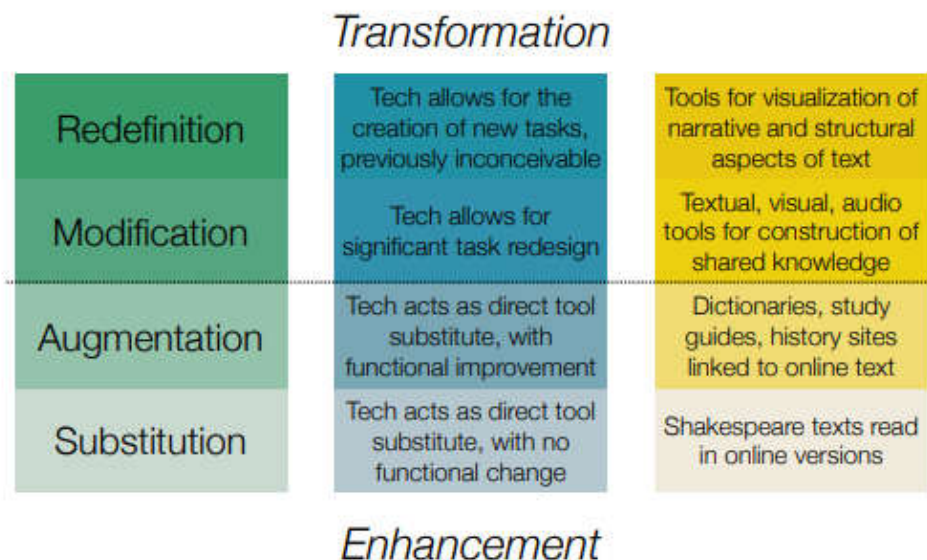


Figure 2-9: Levels of use of the SAMR model: Classroom examples (Puentedura, 2006)

2.6.3 Teacher training

Now that it has been explained that teachers need to decide on the type of technology they want to incorporate in their lessons, it is necessary to point out that they need training in this decision. There are many aspects involved and a teacher cannot merely “introduce technology in the educational process” (Mishra & Koehler, 2006:1018). Additionally, Mishra and Koehler (2006:1018) state that it has become vital to know “*what* teachers need to know in order to appropriately incorporate technology into their teaching”. This involves pre-service teachers to be trained at university level to be able to know how to incorporate technology effectively in subject-specific areas. In a South African context, Mentz and Mentz (2002) focused on the need to include technology as part of classroom learning and teacher training programs.

In another study done by Adetimirin (2020), there is more of a focus on the ethical use of technology and the need is expressed to train teachers and lecturers to use technology in such a way that it does not make them guilty of “copyright infringement and plagiarism in the retrieval of information resources” (Adetimitin, 2020:70). Pre-service teachers need to be trained to know which ethical procedures should be followed when making use of technology in the classroom.

They cannot simply 'know' what the ethical procedures are if they do not receive explicit training in this field.

2.7 Summary

In conclusion, it can be seen what literature says regarding EFAL lesson planning and the need of incorporating technology in teaching English in classrooms, as well as the digital literacy and competence levels of pre-service teachers and their perspectives regarding the use of technology. It was also seen that the TPACK model plays an important role in lesson planning and presentation, but not only does it affect the technological pedagogical content knowledge of pre-service teachers, but also the context regarding technology in South Africa, the methods of deciding which technological devices and applications to use, as well as the teacher training that is needed to achieve these goals during pre-service teachers' lesson planning and presentation.

CHAPTER 3 CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In this chapter, as part of the research design, participatory action learning and research (PALAR) will be addressed as well as the theoretical framework that was used throughout the research project, using the participatory research paradigm. Following the research design, the research methodology will be addressed which covers photovoice, reflective journaling, and group discussions that were conducted during the data gathering phase of this research project. Then, a summary of the group meetings will be provided as well as the population and sampling that was done. Following the population and sampling, the validity and quality of PALAR will be addressed as well as the trustworthiness, credibility, transferability, dependability, and confirmability of PALAR. Finally, the role of the researcher as well as the ethical considerations for this research study will be discussed.

3.2 Research design

A research design is a plan and road map that directs the way research is done in a research project (Denzin & Lincoln, 2011:244). Additionally, a research design involves the development of the whole research plan, which includes developing research questions and objectives, collecting data and analysing it to come to findings that answer the initial research questions of the study (Creswell, 2013:5). A research design, therefore, is the “logical sequence that connects the empirical data to a study’s initial research questions and, ultimately, to its conclusions” (Yin, 2014:28).

3.2.1 Conceptual framework

3.2.1.1 Transformative theory

This project is based on transformative learning theory and specifically the research of Mezirow (1991). Transformative learning theory can be defined as the “process of effecting change in a frame of reference” (Mezirow, 1997:5). These “frames of references” can further be explained as the “structures of assumptions through which we understand our experiences” and contain “cognitive, conative, and emotional components” (Mezirow, 1997:5). Mezirow’s transformative learning theory suggests adults learn through a reflective process when changes occur in their belief systems, attitudes, and behaviour (Kitchenham, 2008) and it consists of four processes of learning (Mezirow, 1991; Kitchenham, 2008:117; Mezirow, 1997:5).

The first process involves critical reflection on how adults learn by “adapting to the needs and demands of the broader, socio-cultural context” (Dirkx, 1998:1-2). This denotes the way in which certain assumptions of individuals (mostly unconscious) shape their views and thoughts (Mezirow, 1991). These assumptions act as a pair of glasses or lenses that individuals use to make sense of the world around them (Mezirow, 1991). The second process involves those unplanned events that occur and which challenge the individuals’ current assumptions, beliefs, and views (Mezirow, 1991). Thirdly, the transformative process involves self-reflection to investigate the assumptions, beliefs, and views that were challenged during unplanned events (Mezirow, 1991) and this reflection can occur in dialogue form with oneself, mentors, or peers (Mezirow, 1991). The fourth part of the transformative process entails the part where the individual changes or adapts his/her current set of assumptions, beliefs and views that were challenged by the unplanned event (Mezirow, 1991), which then leads to a new set of assumptions, beliefs, and views. The process of transformative learning is, therefore cyclical and continuous as adults encounter an event, ponder on the change, reflect, and amend or adapt their assumptions, beliefs, and views (Mezirow, 1991).

Transformative learning theory is fit for a PALAR study as it allows for critical self-reflection of participants and it emphasises the importance of interaction, input, self-reflection, and change.

3.2.1.2 Participatory action learning and research

In the midst of a meat shortage crisis in the 1930s, Kurt Lewin coined the term “action research” with the hope to solve the problem at hand (Creswell, 2015:579; Glassman, 2013:273-274). Action research is a research design that aims to find a solution to a “practical problem” (Creswell, 2015:578), and is “concerned with the betterment of human situations” (Feldman, 2007:22). Furthermore, action research is a “cyclical iterative process of action and reflection on and in action” (Zuber-Skerritt, 2015:10). Generally, action research is used in educational settings to collect information to improve teaching methodologies and settings that will, in turn, improve learning (Cresswell, 2015:579; Glassman *et al.*, 2013:272). Action research is a “proactive strategy”, and the research done in such a study has “political and social relevance” (Sanoff, 2014:139). The moment “people and their concerns” are used as the foundation of a research project, it becomes participatory research (Sanoff, 2014:139). In this research project, a participatory action research approach will be followed.

Participatory action learning and research (PALAR) involves a transformative approach which is holistic in nature (Zuber-Skerritt, 2015:10; Wood, 2019:3). PALAR is a combination of participatory action research (PAR) and action learning (AL) (Wood, 2019:6). PALAR is also described as “transformative” due to it being able to cause change in current practical problems. Additionally, PALAR is known for its ability to create awareness in people's learning and consciousness (Zuber-Skerritt, 2015:10). This ensures that change is eminent through action research. Wood (2019:8) recommends PALAR in a South African context, as too many individuals in this developing country have “a low self-esteem” due to limited access to resources and knowledge, and the integration of “action learning” can provide a safe environment and “dialogical spaces” for participants to act in.

As addressed in the problem statement, many pre-service teachers may feel overwhelmed by technology, and therefore simply do not feel competent to use technology in their lesson preparation and lesson presentation. Additionally, Wood (2019:8) recommends PALAR due to the academic researcher becoming an active participant in the research project. In this research project, the researcher collaborated with the participants to be actively involved in solving the problem of addressing pre-service EFAL teachers' digital literacies in lesson preparation and presentation. Wood (2019:2) and Wright (2014:35) argue for a more democratic and inclusive paradigm, where the people who are experiencing the problem become part of the solution, which leads to these individuals to grow and learn while actively solving the problem they experience. Relationships in the research project were built on “trust, accountability and responsibility”; therefore, it was the aim of the researcher to win the trust of the participants through modelling responsibility and creating a safe space for participants to actively share their concerns and solutions in discussions and meetings (Wood, 2019:8; Rigg, 2014:12). It is due to these advantages that PALAR is used in this research project.

As stated earlier, the PALAR process is a cyclic process and two cycles were used in this research study. The first one was the cycle of asking why and the second cycle was the process of asking how. During the progress of this research project, participants were urged to constantly asked why and how during group sessions to aim to answer the research questions. During the group sessions, the following image was shown to the participants by the researcher to remind everyone of the cyclic process of the research study.

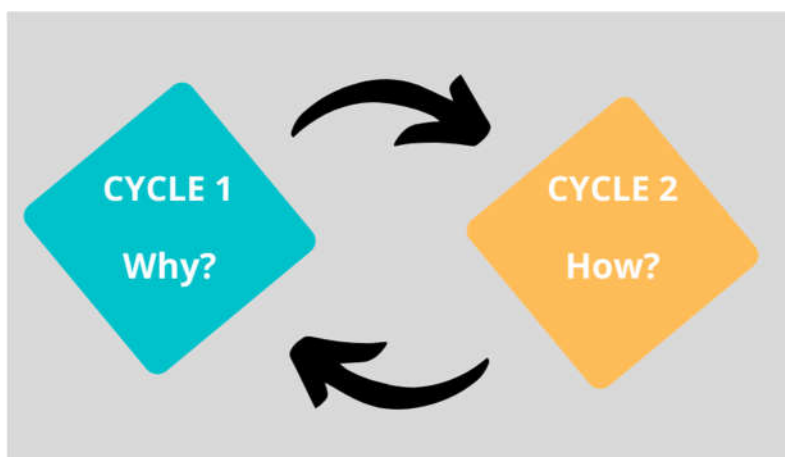


Figure 3-1: Research project cycles

3.2.2 Theoretical framework

To ensure that a research project is successful, a project plan is necessary. Hence a conceptual framework to explain how the study was conducted. Stringer (2013:33) states that action research is a “collaborative approach to inquiry or investigation” which enables the researcher and participants to act and provide answers to practical problems. It is therefore necessary to conduct research in a certain order to ensure the project is seen “in its entirety and therefore identify areas of strength and concern” (Louis, 2014:173). Accordingly, a conceptual framework is needed to provide the researcher with a map of the processes involved in this research project. A conceptual framework was therefore used, as suggested by Wood (2019:130).

Wood (2019:130-139) adapted the PALAR process from Zuber-Skerritt (2013), who developed the “figure eight” research process for the purposes of teachers’ professional development. The PALAR process starts with small groups consisting of the researcher and participants sharing their collaborative ideas on the research project, to come to a collaborative vision for the project. Next, participants in the small group share their best traits and skills to determine what they may add to the research project, as well as what they might learn from it, to determine a mutual purpose where they can work together. The next step is to form the team and to create a “positive climate, [where] members can negotiate roles and responsibilities, building on the strengths identified within the group” (Wood, 2019:133). After the team has been formed, a context analysis – via a mind-map – is done to determine the resources that are available in the community. Once the resources have been identified, research goals were determined, which involves “feasible” and “broad” research goals to prepare for the data gathering phase. After this has been completed, an ethical contract should be developed to apply for ethical clearance from the university.

The next phase involved the research phase, which included the designing of research questions and was done collaboratively with the participants. When the research questions were set, research methods to “generate and analyse data” were determined (Wood, 2019:135). Next, an action plan was created by the small group of participants and researcher to “decide collaboratively on what they will do, who will do what, how it will be done, where and by when” (Wood, 2019:137). Once the action plan was in place, a collaborative analysis of data was done by the participants and researcher. The next step was to decide “on dissemination of learning”, which involved collaborative dissemination, and usually occurs at a “celebratory event” (Wood, 2019:138). Towards the end of the process, participants had the opportunity to reflect on what they have learned through this process, and future plans (regarding the research project) were then addressed.

Afterwards, the PALAR process, initiated the “next cycle of research”, which led to new questions, changes in the existing ones, and adaptations of the vision. General changes were made to members, and gathering knowledge was also addressed. This process then repeated itself. The last part of the process was the “relationship and reflection” as well as the “recognition of participants’ achievements and learning” parts (Wood, 2019:138). Wood (2019:139) states that “ongoing critical self-reflection and reflection on collaborative learning is the cornerstone of all action research processes”. The process on the next page is adapted from Wood (2019) to illustrate what the PALAR process looks like:

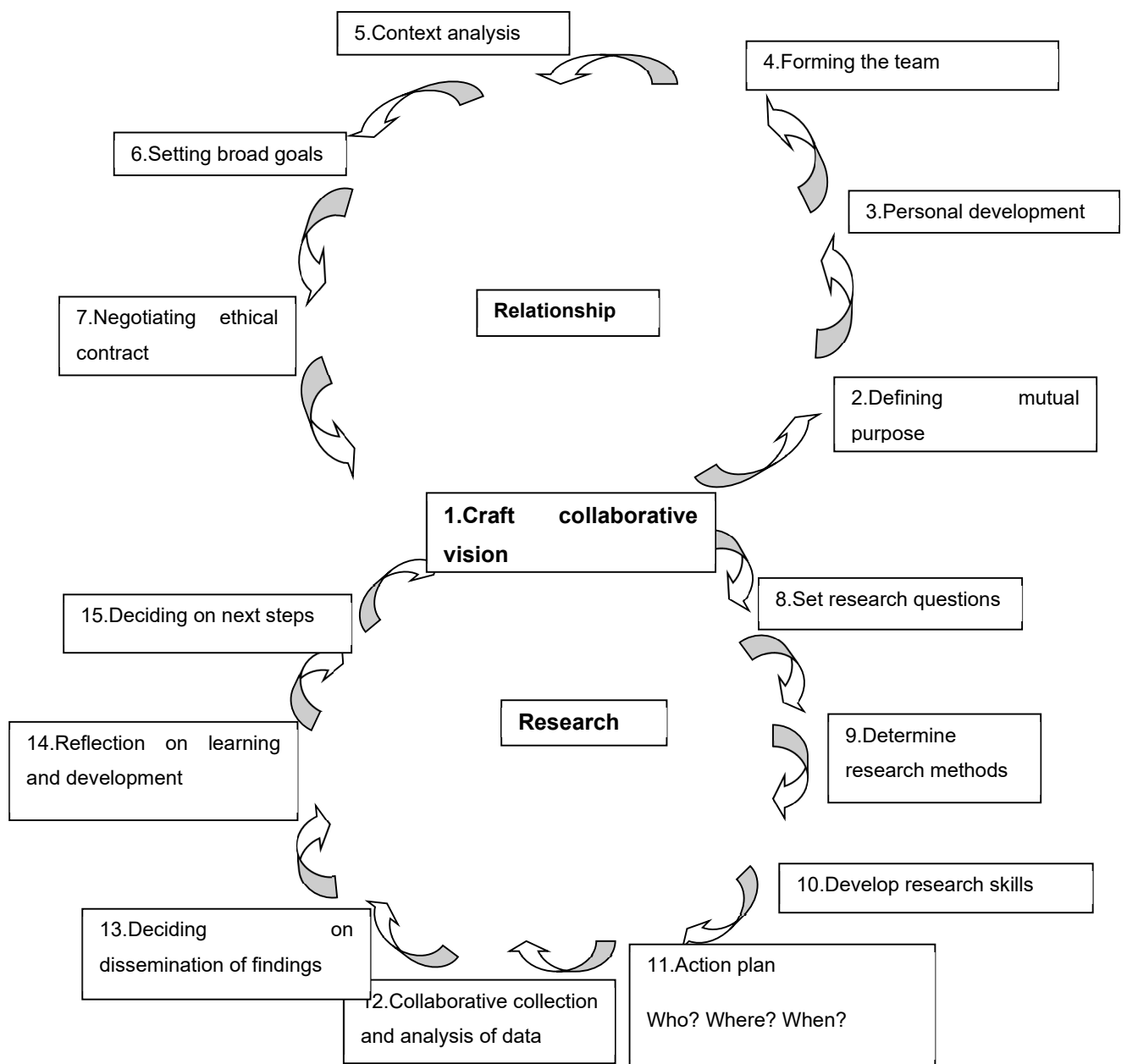


Figure 3-2: PALAR figure 8 process.

3.2.3 Research paradigm

The paradigm of a research study refers to the assumptions about essential perspectives which underlies a specific worldview (Nieuwenhuis, 2016a:52; Zuber-Skerritt, 2015:12). It therefore refers to the perspective from which the research is executed (Burton *et al.*, 2011:6-7). The very heart of action research relies on its epistemological features (Zuber-Skerritt, 2015:12). In this research project, the group of people who form a community, is the third- and

fourth-year senior and FET-phase pre-service English for Education teachers at the North-West University.

To ensure that findings stay as objective as possible, action research relies on the participation of subjectively involved views and interpretations, which relies on beliefs, viewpoints and value systems (Zuber-Skerritt, 2015:12). Additionally, Wood (2019:3) recommends that research paradigms should be transformative, collaborative and democratic. Wood (2019:3) continues and describes “transformative” as “a way of thinking that is continually open to change”. Thus, research paradigms need to be democratic, which ensures that participants and partakers have an “equal say in decision making” during a collaborative learning process. This research study was conducted from a participatory paradigm.

A participatory paradigm assumes that the researcher understands “reality from the viewpoint of others” (Wood, 2019:23). This paradigm also aims towards “positive change” by taking political action in collaborating with others in the research project (Wood, 2019:23). In this research study, a participatory paradigm enabled third- and fourth-year pre-service English for Education teachers to share their experiences regarding the inclusion of technology in their lesson preparation and lesson planning from their point of view.

3.2.4 Research design summary

It is evident that by following the conceptual framework of PALAR and incorporating transformative, democratic and inclusive methods and strategies, it will help to solve the problem of including technology in pre-service teachers’ lesson planning and presentation phases, and is therefore an effective way to actively improve the learning and development of the third-and-fourth year pre-service teachers who took part in this research study.

3.3 Research methodology

3.3.1 Data collection strategies, population, and sampling

The process of collecting data involves certain techniques in gathering data regarding a certain topic (Nieuwenhuis, 2016a:87). Data collection includes that the researcher notices the data and uses it “as data for the purposes of his or her research” (Dey, 1993:15). This research study used participatory reflection as a data gathering strategy (Ebersöhn *et al.*, 2016:148).

3.3.2 Participatory action research data collection techniques

In this participatory active learning and research project, three data gathering techniques were used, which include photovoice, reflective journaling and action learning group discussions.

Firstly, photovoice is defined as a creative participatory research technique that provides participants with cameras to visually document their first-hand experiences to “promote an effective, participatory means of sharing expertise and knowledge” (Wang & Burris, 1997:369; Wang, 1999:185). Photovoice has three primary goals, which is to “record and reflect” on community strengths and concerns, to illicit an opportunity for dialogue to address “personal and community issues through group discussions”, and to “reach policymakers” (Wang & Burris, 1997:369; Wang, 1999:185; Wood, 2019:137).

In this study, photovoice was used to capture participants’ perceptions of using technology in their lesson preparation. The photos captured by the participants were shown at action group discussions where other participants could talk about what they see on the photos, what they understand regarding technology in lesson preparation, and guiding learners to become active and independent learners. In this research study, the data gathered from photovoice data will be analysed by Atlas.ti. The reflective journals written by the participants was coded and analysed using Atlas.ti.

Secondly, reflective learning journaling was used as a “pedagogical tool” to promote learning through journal-writing as part of professional development and growth (Moon, 2006:8; O’Connell & Dymont, 2011:47). Reflective journaling as a data gathering strategy is defined as “written documents that students create as they think about various concepts, events, or interactions over a period of time for the purposes of gaining insight into self-awareness and learning” (Thorpe, 2014:328). Together with reflective journaling, video journaling was done, which is just the video recording of the participants’ view. Reflective journaling holds many advantages for a participatory action learning and research study, as it motivates and urges participants to reflect on their own “thinking and problem-solving strategies”. It also promotes “effective acquisition and transferability of cognitive and metacognitive skills”, as it urges participants to identify a problem and look for new ways to solve the problem, and it also “makes conceptual changes” which are “visible for assessment purposes” (Dunlap, 2006:20). Thorpe (2014:328) postulates that reflective journaling rests on trust between the researcher and participants as true and honest feelings and thoughts are journaled. Reflective journaling also takes time, commitment and a whole “involvement of self” (Thorpe, 2014:328). Therefore, reflective journaling will be done by all participants including the

researcher in this study. It can be done by means of Padlet, which can easily be shared. The reflective journaling will be used and analysed by the researcher using Atlas.ti.

Thirdly, action learning group discussions were held (as suggested by Wood, 2019:177). Action group discussions in PALAR encourages participants to think together in a group setting and tap into one another's knowledge, experience and problem-solving skills. Through action learning group discussions, the researcher directed participatory group members to what their role is in the research project and to determine their next actions (Wood, 2019:177). During the first action group discussion, the participants and researcher met, and the process of building trust began by means of an introduction where everyone introduced themselves. An introductory game was then played to get a better idea of everyone's perception about technology in lesson preparation and presentation.

The action learning group discussions were transcribed, and the verbatim transcribed data will be coded by the researcher using thematic content analysis (TCA) (as described by Anderson, 2007). TCA involves the "thematic content of interview transcripts by identifying common themes in the texts provided for analysis" (Anderson, 2007:1). The verbatim transcribed action learning group discussions were analysed using the biographical narrative interpretive method (BNIM) (as described by Corbally & O'Neill, 2014). BNIM is a data analysis technique that provides the researcher with an in-depth look at participants' "life stories in context" (Corbally & O'Neill, 2014:2). BNIM rely on a "full verbatim transcript of the interview" and involves three aspects of humanity, which includes a participants' life story and history (Biography), how they tell their life story (Narrative), and their social interpretation of their life story (Interpretive) (Corbally & O'Neil, 2014:1). This includes how the participants introduce themselves and see themselves as future teachers, and how they tell their own story and their attitude during the narration. This influences their view of themselves as teachers, their capabilities in teaching and in using technology. It also indicates how they see themselves while participating in the group discussions, and whether they are confident to talk about their view of incorporating technology, finding new ways, and reflecting on their current practices.

During the course of this research study, nine (9) meetings were held until a point of data saturation were reached and when participants felt that they did not have more information to add to answer the research questions. A short summary of every meeting is provided to give an overview these sessions.

Meeting 1

During meeting 1, the research solely focused on starting to meet the participants who were willing to take part in the study and start building a relationship with them. The researcher used different methods to enhance relationship building, and during this session the participants were asked to create a tree diagram to introduce themselves. They were guided by asking them to draw the leaves, branches, trunk, roots and environment to express how they see themselves. After the ice-breaker activity, the researcher proceeded to explain what the study is about, what cycles are involved, and what questions the project aims to answer. The session concluded after setting the date for the second meeting.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1J228Jfo7vdmBepJwqoBdB4xYpwmjB2GX/view?usp=sharing>

Meeting 2

During meeting 2, everyone was welcomed back, and the researcher explained the process of a PALAR study and all the aspects that are involved in this research project. After that, Mentimeter was used to ask the participants which of the aspects provided (logic, emotions, manager or optimist) explains their personality the best. After everyone answered the question on Mentimeter, we played a guessing game where the researcher asked each participant individually what they think the other participants chose. This resulted in a fun activity where everyone got to know each other better. After the ice-breaker activity, the researcher explained the figure 8 process as well as the cycles in this research study. I also explained the relationship between the researcher and the pre-service teachers who are all collaborative participants, and we addressed the roles they think they have in the research project. After this, we continued answering questions on Mentimeter. At the end of the meeting, I asked everyone to search for an image that explains their idea of a perfect classroom the best. The meeting ended after we determined the date of the next meeting.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

https://drive.google.com/file/d/1JWsPul5OYdCJn_qR88zRIEg0I_oWTTQS/view?usp=sharing

Meeting 3

During meeting 3 I welcomed everyone back and introduced the ice-breaker activity, where the participants had to choose a superpower and say why they chose it. The ice-breaker activity strengthened the relationships of the participants, and everyone was eager to share their choice of superpower. After that, I explained to everyone what a fishbone analysis is, after which we looked at the research questions again, and continued to look at possible causes why pre-service teachers might not use technology during their lesson planning and presentation. After discussing that, we looked at the effect it has as well. After setting the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1MFzd-cM6wB0XdJLIph98IEs2AGfYcrjO/view?usp=sharing>

Meeting 4

Before meeting 4, I sent the participants an ice-breaker activity with a backpack image and asked them to write down their positive traits and skills they received to do things in their life. After we looked at everyone's backpack and discussed their skills, we used Mentimeter again to answer questions regarding the types of programs they use during their lesson planning. After we discussed everyone's answers, we completed a chart on Mentimeter that asked how long it takes them to complete a lesson plan. We then commenced to focus more on lesson planning and created a graphic organiser in the form of a mind-map to determine what works well during their lesson planning phase, what their feelings and perspectives are during lesson planning, what activities they prefer to use, and what aspects they are struggling with during lesson planning. After asking everyone to reflect on Padlet, and setting the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1Lc2OaGNgwn88nnK5qwTcd3msMaZ0vC1V/view?usp=sharing>

Meeting 5:

During this meeting, many of the participants were sick and others struggled with semester work and external factors like load shedding. We started the meeting by doing a spin-the-wheel activity where I allocated certain numbers to every participant and spun an online wheel. When the wheel stopped on the participant's number, I asked them a question to get to know them better. After the ice-breaker activity, we continued to focus more on the context of the participants and the learners they work with, and proceeded to find themselves by completing an asset mapping document. We looked at the resources we have available as individuals, the organisations and associations that are available, as well as the institutions, services and the economy in the South African context. After discussing these resources and determining the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/drive/folders/1LdbgrIRLKunMXHbZznlgW2aPkCTXZMUW?usp=sharing>

Meeting 6

During meeting 6, the participants got together in the midst of Stage 4 load shedding, and I asked them to choose a colour of the rainbow that represented their current mood and situation and say why. We then continued to recap on the different cycles of the research study and what we addressed in the previous five meetings. We then started thinking of ideas to create an intervention plan to give pre-service teachers guidelines on how to use technology effectively in their lesson planning and presentation in an EFAL classroom. After discussing possible intervention plans and determining the next meeting date, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

https://drive.google.com/file/d/1MN2k_mB5BvDhW3FYqcn5e8h1D3W2iGbw/view?usp=sharing

Meeting 7

During meeting 7, the participants got together on MS Teams, and as an ice-breaker activity I asked everyone to share one thing that is on their bucket list that they still want to do one day. After discussing everyone's response, we continued to work on an intervention plan to give pre-service teachers guidelines on how to use technology effectively in their lesson planning and presentation in an EFAL classroom. After discussing the intervention plan and setting a date for the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link: https://drive.google.com/file/d/1NZasjqGg_ZilcNvupWOrhCEcjc_rEezg/view?usp=sharing

Meeting 8

During meeting 8, we used Mentimeter during the ice-breaker activity. For this activity everyone had to say which goal they have reached this year that they are proud of. After discussing that, we continued to answer questions on Mentimeter regarding their use of technology during the WIL, what their perceptions are now after time passed, using technology throughout the year, and whether they used technology during their teaching moment at their WIL practical. We then continued to write down responses on Mentimeter on what guideline they would give other pre-service teachers when using technology in their EFAL lesson planning. After determining the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link: https://drive.google.com/file/d/1O5jDJMnbfEoS1py4w1_svEGydaulqi2g/view?usp=sharing

Meeting 9

During this meeting, I asked everyone to search for an image on Google or take a photo resembling their experience of taking part in this research project. I told everyone to search for that during the meeting and that we will get back to the icebreaker at the end of the meeting. We then continued to look at the fishbone analysis and the intervention plan again, and added information where necessary. I reminded everyone about the cyclical process in this study, and after adding information to the fishbone analysis and the intervention plan, we looked at each

person's ice-breaker image. After thanking everyone for taking part in this research project and asking them to complete the Padlet reflection for meetings 4 to 9, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1P6S-OThbM6fWUS-ccSi79LUmRqP8c8Ps/view?usp=sharing>

3.3.3 Participatory action research data analysis

Data analysis plays a key part in the cyclical action and critical reflection of participatory action research (Cahill, 2007:181). McNiff and Whitehead (2002:32) state that rigorous data analysis involves arriving "at agreed interpretations of the data". When analysing data, it is imperative to provide "detailed consideration to the proposed data analysis" (Norton, 2009:89). It is also necessary to clearly state the exact methods that will be used to analyse the data (Norton, 2009:89). Additionally, Creswell (2015:243) states that there are numerous ways to analyse data and there are also certain steps to follow while coding the data. In this research study, the data was coded using the following steps suggested by Creswell (2015:243):

Step 1: First, I carefully read through all the transcriptions, captions of the photos that were sent by the participants, the fishbone analysis and the graphic organiser to get a complete idea of all the group meetings that were held. As I read through the transcriptions, I made notes of possible themes.

Step 2: I then took the transcription of the first meeting and asked the question as suggested by Creswell (2015:243) "what is this person talking about?" From there I considered the meaning underlying the comments each person was making.

Step 3: Then I started to code the verbatim transcription of meeting 1 by starting with the main themes in my research questions, as this is ultimately where I want to end up, and put the segments that are applicable to these themes (perceptions, technology, training, lesson planning, lesson presentation, digital literacy, digital competence, lesson presentation) in brackets.

Step 4: After coding the verbatim transcription of meeting 1, I made a list of the codes that were used the most and left the ones I did not use as much. At this stage, I did not code too much, as I planned to come back to this document and code the sections I have missed.

Step 5: I then took this list of codes and coded the other documents as well. I also added new codes, as there were other themes that arose during the group discussions.

Step 6: After coding the documents, I reduced the codes and created themes where these codes fall under. I then reread the documents to code the sections, comments and segments I might have missed.

Through coding the data gathered through the verbatim transcriptions of the meetings, the reflections and photovoice, the following themes were identified:

Table 3-1: Themes and codes

Themes	Codes
Context	Context
Technology	Digital competence
	Digital literacy
	Pre-service teachers' perceptions
	Teacher training
	Lesson planning
	Lesson presentation
	Teaching moment

3.3.4 Population and sampling

In this research study, purposive sampling was used. According to Etikan *et al.* (2016:2), this sampling method is also called “judgement sampling”, where there is a specific choice made by the researcher in the search for participants. The researcher was not allowed to contact the students directly, therefore an independent person posted an advertisement on the relevant eFundi sites and briefly explained the research study. The interested students contacted the independent person, and thereafter the researcher provided more clarity and answered questions. The independent person collected the consent forms from the interested participants. Thereafter, the students who were willing to participate were added to a WhatsApp group where the researcher communicated with them. The aim was to create a collaborative group of the willing participants. Group discussions were held, and these small group sessions took place on an online platform (Microsoft Teams) to limit exposure and interaction concerning the COVID-19 regulations of the NWU. It was during these meetings that the primary researcher made field notes and journaled the observations made during the sessions. These observations were to see whether the participants were willing to adapt and change their attitudes, as well as whether their perceptions were that of a reflective teacher-to-be, and whether they were willing to look at themselves objectively and change what they see needs changing.

The profile of the different participants are as follows:

Table 3-2: Participant profiles

Participant number:	Age:	Gender:	Home Language:
Participant 1	47	Female	Afrikaans
Participant 2	26	Female	Se-Tswana
Participant 3	20	Female	Afrikaans
Participant 4	20	Female	Se-Tswana
Participant 5	21	Female	Se-Tswana
Participant 6	20	Female	Afrikaans

3.4 Quality assurance and data verification

Rigour in action research plays an important role, as it is necessary to determine whether the data have been verified correctly and that there is evidence for the outcomes of an action research project. Academic rigour is determined whether the work done in a research study can actually “stand”, which means that it has contributed to the “knowledge-creating society” (McNiff & Whitehead, 2002:106).

3.4.1 Participatory action learning and research (PALAR) data assurance

3.4.1.1 Validity and quality of PALAR

Validity in action research is defined as the “relationship between the research and the situation researched” (Dick, 2014:805). Due to action research being done in social settings and achieving different results every time the research is repeated, many researchers have decided to use different terms for “validity” in action research (Dick, 2014:805). The term “quality” is often used as a synonym for validity (Dick, 2014:690; Feldman, 2007:22). In this research study, validity and quality are used synonymously to illustrate the trustworthiness and reliability of the study.

There are certain factors that affect the validity and quality of action research. To determine the validity and quality of a research study, questions can be asked like whether suitable participants are involved in the research study and whether they are dedicated in such a way that they are willing to provide truthful feedback (Dick, 2014:805). For instance, in this research project, it proved challenging to get fourth-year pre-service teachers who are dedicated to the project and willing to provide truthful answers, as they are already busy with their final years in their B.Ed.

degree and have other responsibilities besides those pertaining to academics. One way of solving this was through continuous processes within the cycle (Dick, 2014:805; Ebersöhn *et al.*, 2016:145). It is possible to pursue action and knowledge until it is attained through continuously searching for pre-service teachers who are interested in the project and willing to reflect on their own knowledge and practices (Dick, 2014:805; Ebersöhn *et al.*, 2016:145).

There are also different types of validity in a PALAR study. Wood (2019:126) postulates that validity in a PALAR study includes the process validity, dialogic validity, catalytic validity, democratic validity, and outcome validity.

3.4.1.1.1 Process validity

This type of validity focuses on the “quality of the research process” (Wood, 2019:126). In a PALAR study, relationship building plays an important role during the research process, and it is important to keep to the principles and determined cycle of the research process (Wood, 2019:126). In this study, the researcher explained, showed and talked about the two cycles that this PALAR study focussed on, which is the *why* and *how* cycles. During the nine meetings that were held, I constantly asked *why* and *how* to evidently answer the research questions that ask what the perspectives of pre-service teachers are regarding technology, how pre-service teachers use technology in their lesson planning and presentation, and how pre-service teachers can ensure they include the teaching moment using the TPACK model in their EFAL classrooms.

3.4.1.1.2 Dialogic validity

This type of validity focuses on the available area in the study where participants can share their experiences and collaborate freely to “enable mutual learning and understanding in developing knowledge” (Wood, 2019:127). This was done in this research study by continuously asking the participants what their opinions were, as well as to respect each other’s views throughout the study.

3.4.1.1.3 Catalytic validity

This type of validity involves participants to understand the problem at hand as well as “their reality in order to change it” (Wood, 2019:130). During this process, participants change and redirect their “attitudes, self-belief and agency” to successfully provide a possible solution to the real-life problem at hand (Wood, 2016:130). In this research study, the participants constantly reflected on their own practices on a Padlet, and constantly evaluated their input by going back and forth in the study to add information to areas where they might have missed something.

3.4.1.1.4 Democratic validity

This type of validity forms part of the core principles of a PALAR study in the sense that it focuses on the participants having a direct “stake in the problem under investigation” (Wood, 2019:131). The problem that is being investigated has a link to the lives of the participants (Wood, 2016:131), which was also the case in this research study. The participants are pre-service teachers who are experiencing the problem of technology inclusion in lesson planning and presentation in their own lives, and who aimed to change this notion by designing guidelines to help themselves and their peers improve.

3.4.1.1.5 Outcome validity

This final type of validity focuses on whether a solution was provided to the problem under investigation at the end of the research study (Wood, 2019:129). This was in fact the case in this study, where the participants worked together in their group sessions to identify the problem areas and create guidelines that can be used by pre-service teachers to effectively include technology in their lesson planning and presentation.

3.4.1.2 Trustworthiness of PALAR

“Trustworthiness” in research is also known as “rigour” (Dick, 2014:805). To establish rigour in action research, it is necessary to ensure “applicability, consistency and neutrality” through enabling “post hoc assessment” of the results found (Baskerville, 2014:690). When this is done, the “knowledge product” becomes trustworthy, as it has been proved that researchers demonstrate their involvement and are “aware of the context” as well as being “open and attentive, careful and conscientious, sensitive, and empathic and honest and reflexive” (Baskerville, 2014:690). In this research project, the researcher was an active participant and worked with the participants to search for answers to the guidelines pre-service teachers need to incorporate technology in their lesson planning and preparation. In order to establish trustworthiness in participatory action learning and research, it is necessary to look at the following concepts in this research project: credibility, transferability, dependability, and confirmability (Baskerville, 2014:380; Ebersöhn *et al.*, 2016:145).

3.4.1.3 Credibility of PALAR

It is necessary for action research to provide “persuasive evidence” for the claims that are made in order for it to be assessable and acceptable to the person reading it (Zuber-Skerritt, Fletcher & Kearney, 2015:17; Baskerville, 2014:690). As a researcher who actively participates in the

research project, it is necessary to be credible in the sense that participants can observe how action research is applied and demonstrated in practice to add to the “knowledge construction of the group” (Zuber-Skerritt *et al.*, 2015:153). The researcher was therefore actively involved in finding answers to how technology can be better used in lesson planning and preparation.

Credibility can be achieved through different ways in an action research project. One way is to ensure that there is enough “time commitment” to the research project to illustrate how results have been achieved to the “practical problem at hand” (Baskerville, 2014:690; Ebersöhn *et al.*, 2016:145). This was achieved in this research project by spending time with the participants during our group discussions and win the trust of the participants.

Another way to add to the credibility of the research study is to ensure that there is a “theory-action-consequence relationship” in the study, to ensure that there are “persistent observations” in the “practical and theoretical outcomes” of the research study (Baskerville, 2014:690). This was done by making field notes and writing journals during small group meetings.

Credibility is also increased in a research study when rich and valuable evidence is collected when the researcher becomes an active member in “social settings” (Baskerville, 2014:690). “[F]orming the team” (Wood, 2019:130) was done by creating a social and welcoming atmosphere. Repetition during the data gathering phase caused for “a large volume of empirical data”, which is also beneficial for the triangulation of the findings from “multiple data sources, multiple theories and multiple iterations” (Baskerville, 2014:690; Ebersöhn *et al.*, 2016:145). This was achieved by going back and re-evaluating the research questions, re-planning the goals, and reflecting on what has been addressed during the small group meetings. According to Baskerville (2014:690), credibility can be increased when the research incorporates “reflexive evaluation” by explicitly identifying what findings have been uncovered about the “setting, theory, action”, etc.

3.4.1.4 Transferability of PALAR

Baskerville (2014:690) states that effective credibility provides the foundation for transferability in a research study. It is necessary for “future researchers” to see the findings from an action research study done in the past, as relevant to current situations and settings (Baskerville, 2014:690; Ebersöhn *et al.*, 2016:146). “Transferability” involves the understanding of an old research setting and theory, as well as the current and future settings (Baskerville, 2014:690; Ebersöhn *et al.*, 2016:146). To achieve this, ample notes, journals, diaries, etc., are needed (Baskerville, 2014:690). In this research project, it was necessary to collect the necessary data to ensure that the action research done in this study will still be valuable in future studies.

By going back to re-evaluate the research questions and goals, and restructuring the small groups, it is possible to answer the question of which guidelines are necessary to help EFAL teachers incorporate the TPACK model in their lesson preparation and planning phases. This can also be used for future research, as the use of online teaching only increases.

3.4.1.5 Dependability of PALAR

It is crucial for action research to make sense to participants and provide “deeper insights into their lives and worlds” (Zuber-Skerritt *et al.*, 2015:17). It must therefore be useful in practice to the extent that it ensures actual change to an existing problem (Zuber-Skerritt *et al.*, 2015:17). The dependability of an action research study relies on the study operating successfully for long periods, and not only once (Baskerville, 2014:690). Therefore, this research project can be repeated with future fourth-year pre-service teachers to ensure that they actively look for new ways to become competent in applying the TPACK model in their EFAL lesson preparation and lesson plans. An action research project becomes dependable by repeating the research cycle “until the theory-action-consequence moves beyond an action experiment to become a documented operating solution” (Baskerville, 2014:690). It is possible to achieve these well-documented operating solutions through taking thorough field notes (Ebersöhn *et al.*, 2016:146).

3.4.1.6 Confirmability of PALAR

Confirmability involves that the action research must be done in such a way that it can be “reconstructed” (Baskerville, 2014:691). Once the necessary documentation is present in an audit of the study in an inquiry, credibility, transferability and confirmability are achieved (Baskerville, 2014:691). Baskerville (2014:691) furthermore claims that in action research “the purpose of an inquiry audit is to confirm the knowledge, not necessarily the research but rather the process” which produces the knowledge. For action research to have confirmability, an inquiry auditor can analyse the research process to determine whether it was done thoroughly (Baskerville, 2014:691). The most important component of action research is the researcher’s reflexive journals and field notes (Baskerville, 2014:691; Ebersöhn *et al.*, 2016:146). To ensure that observations and discussions were done correctly and are dependable, it is necessary to go back to the field notes taken and reflect on the discussions during small group meetings. By doing this, the researcher will be able to ensure confirmability in the research project due to the reflexive nature of notes taken and observations made.

3.5 Role of the researcher

The researcher is a key element in this research study, and it is the sole responsibility of the researcher to develop the title of the study as well as to do the research and report on the findings (Creswell, 2013:45). In action research, the role of the researcher is to be a “participant in your own research project” (Creswell, 2015:595). The manner in which the action researcher acts, entails to enable “choices of identity and collaboration to take place through appreciating another’s point of view” (McIntosh, 2010:37). McDermott (2002:130) claims that putting oneself in the middle of an action research project and having an “attitude to enquiry that is reflective, reflexive and sceptical puts many taken-for-granted assumptions about research under pressure”.

As an external marker and temporary junior lecturer at the North-West University and research assistant for the English for Education Department at the Faculty of Education during the COVID-19 lockdown (2020 and 2021), we have identified the need of pre-service teachers to be better equipped with technology. Being in the position to mark students’ lesson plans makes me, the researcher, part of this research project and an active participant in solving the problem of utilising technology effectively in EFAL lesson plans, as well as ensuring that a teaching moment is included in these lessons. It was, therefore, my aim to work with students to generate guidelines for fourth-year pre-service teachers on how to use technology correctly in their EFAL lesson planning and presentation at the end of this research project.

3.6 Ethical considerations

Ethical considerations during action research plays an essential part in the research project. Ethics can be defined as a “system of principles and rules that help us determine which actions are right and which are wrong” (Manzo & Brightbill, 2007:33). This set of principles, which governs research ethics, includes respect for persons, beneficence, non-maleficence and justice (Manzo & Brightbil, 2007:33; Wood, 2019:113).

Respect for persons includes having respect for people, the decisions they make as well as those who cannot make decisions by themselves, like children and people with disabilities who need protection (CREO, 2015; Manzo & Brightbill, 2007:34). Respect for others also includes that the researcher uses understandable language to clearly explain what is expected of the participants (CREO, 2015). Furthermore, respect for others also includes that participants voluntarily participate in the research study (CREO, 2015).

Beneficence in action research ethics refers to doing no harm, but focusing on the best outcome for everyone (Manzo & Brightbill, 2007:34; Wood, 2019:113). The Community Research Ethics Office describes harm as “social, behavioural, psychological, physical, or economic”, and adds that participants’ contexts be kept in mind as well as their privacy being protected during the course of this research study (CREO, 2015). However, the researcher cannot guarantee that what transpired during group discussions will stay within the group, as violation of privacy by other participants in the group may occur. Participatory action research aims to get involved in solving a practical problem at hand, and it is therefore necessary to “do no harm”, but to do something to change the problem (Manzo & Brightbill, 2007). In this research study, there were participants from different backgrounds, race and contexts, and everyone respected each other during our discussions on WhatsApp and during our online discussions.

The third ethical principle in action research that needs to be considered is justice, which includes ensuring that all individuals are treated equally and fairly, that no one is excluded based on race, gender, ethnicity, etc. (Manzo & Brightbill, 2007:33; CREO, 2015; Wood, 2019:114). Another ethical aspect that needs to be taken into account regarding action research is respect for the community, which involves researchers looking for new ways to understand the context of the community in which the research study takes place, as well as having respect for the “community’s cultural traditions” (CREO, 2015). During our online discussions, we all enjoyed hearing from each other and the experiences each one brings to the discussion. We soon realised in our sessions that context plays an important part and we embraced the differences we have as a group.

A critical aspect that affects ethical considerations of action research, is the fact that the participants are actively and subjectively involved in the research process as well as the change that is set to occur. This causes the possibility that the research project may “shift unpredictably in response to the social dynamics and changing needs of participants” (Manzo & Brightbill, 2007:34).

Initially, there was a possibility for the participants who were the pre-service teachers in their third or fourth year of study, to influence the research project in such a way that the goals changed and different findings were uncovered. This occurred in a sense that was beneficial to the research project. A better sense of participants’ context was uncovered and included in the findings of the research project. Creswell (2015:590) claims that the relationship between participants and the researcher needs to be considerate and cannot allow data collection to become insistent. There must always be an opportunity for the participants to stop participating in the research project “without being penalized” (Creswell, 2015:590). This was the case for two students who realised

that their schedules did not allow them to continue, and they left the group, which was accepted by everyone.

In this research project, a third-party person was asked to approach third- and fourth-year FET students to take part in this research study with a clear description of what the study entailed and the assurance that any participant can leave the study at any given time without it being held against them. The third- and fourth-year pre-service teachers had the option therefore to choose at any given moment to stop their participation in this research project. Creswell (2015:590) states that it is necessary for the researcher and participants to have a “shared commitment to social justice”. This includes a commitment to be “open and transparent” during participation, to respect others' insight and knowledge, to adopt “non-hierarchical practices”, and to be “positive and sustainable” in the “action research community” (Creswell, 2015:590). The researcher applied for ethical clearance from the NWU to conduct the research, and ethical clearance was given with the ethical clearance number: NWU-01058-21-S2.

CHAPTER 4 DATA ANALYSIS, INTERPRETATION AND FINDINGS

4.1 Introduction

In this chapter, focus is placed on the themes that stood out during the coding process on Atlas.ti. Thematic content analysis (TCA) of the verbatim transcriptions were used which involved the “thematic content of interview transcripts by identifying common themes in the texts provided for analysis” (Anderson, 2007:1). Among the themes that were identified were context, digital competence, digital literacy, lesson planning, lesson preparation, pre-service teachers’ perceptions and teaching moment. These themes were generated through the codes made on the verbatim transcriptions of the nine (9) group sessions, viz.: the Mentimeter slides and question results, a graphic organiser to address lesson planning, an asset mapping document to address the resources pre-service teachers have available, a fishbone analysis, an intervention document and Padlet reflections. These themes will be evaluated and compared to the literature that was found in chapter 2 to show the correspondence between the findings and literature.

4.2 Pre-service teachers’ perceptions of technology

The research question which asks what pre-service teachers’ perception of technology is, will be addressed first. The themes and codes that were identified regarding the perceptions of pre-service teachers will be dealt with now.

4.2.1 Code: Digital competence

When coding the verbatim transcriptions and Mentimeter results, the use of technology was described as “challenging”, “time consuming”, “frustrating” and also not trustworthy. By calling it “challenging”, some participants indicated that they often struggle to use technology during their lesson planning and presenting phase and that it is frustrating for them to deal with technology. They did, however, add that it is “easily accessible”, “convenient”, and “advanced”. In general, the participants were positive towards the use of technology regardless of the fact that it is often challenging and frustrating to use. They also stated at more than one meeting that they preferred to use Word, Google, PowerPoint and YouTube most and also preferred online applications like Kahoot and PowToon. In the ice-breaker activity of meeting 3, I asked the participants which programs they like to use. They had to send three responses using Mentimeter, and the one response that was mentioned the most, appeared in a larger font on the word cloud. The program that the participants use the most is PowerPoint. This is one program that is used by almost all the participants in most of their lessons. PowerPoint might be used this frequently due to its

accessibility but also due to the participants not knowing which other programs to use (Becker, 2017:337). The participants also indicated that they frequently use technology in their lesson planning and presentation, but participant 3 stated that she “only [use it] as a tool” in the classroom as there is limited time; consequently, they do not have access to more tools and are unsure about which tools to use.

An important factor that was addressed under the code of digital competence was the willingness to learn. This perception indicated that self-reflection needs more attention in pre-service teachers and the need to know how to use technology in teacher training programs is also necessary. This concept is also part of the five perceptions teachers have regarding the use of technology in the classroom (Teo *et al.*, 2016:8). Pre-service teachers have the perception that technology is difficult to understand and use, and this perception affects their use of technology during classroom instruction (Teo *et al.*, 2016:8).

4.2.2 Code: Digital literacy

Among the participants, there was one who is 47 years old (participant 1). She stated that her age had an impact on her digital literacy and that the other younger participants, “[grew] up with technology” and that “age definitely plays a role”, which makes it easier for them to understand technology. In a response to this, participant 3, who is in her early twenties, stated that being able to understand and work with technology is an advantage and that “it can contribute to [the learners’] learning experience”. During the design of the fishbone analysis, a possible cause for not using technology during lesson planning and presenting was identified as a lack of knowledge. Participant 6 who is also in her early twenties, commented on this and stated that “yes, lack of knowledge because we don’t always know how to use technology and to use it in planning”. We further discussed the fact that this leads to pre-service teachers avoiding the use of technology altogether. Besides, participant 6 continued and added that another reason for not using technology in lesson planning and presentation could be that some pre-service teachers did not know how to use the software and programs like PowerPoint. In this discussion, it became clear that age was not necessarily the reason for not using technology, but rather the lack of knowledge on how to use technology could be the reason behind pre-service teachers avoiding it.

Another aspect that stood out was that if teachers had a good understanding of the possible uses of technology, they would be able to “model” the use of it and break the “cycle” of not computer/digitally literate, hesitant learners; these would then experience how technology could be utilised. These were the words of the participants who stated that it was necessary to show the learners how the teacher applied the various forms of technology. Again, their lack of

knowledge of how to use technology revealed the sad fact of their not being exposed much to the many uses of technology – this, regardless of the pre-service teacher's age.

Participants also stated that pre-service teachers might not want to use technology because they were not sure how it worked and were afraid that learners might “cheat” while using technology in the classroom. Participants also stated that if teachers did not have the necessary knowledge of the use of technology, it might have a negative impact on their self-confidence as a teacher.

4.2.3 Code: Perceptions

An interesting statement made by participant 2 in meeting 3 was:

When it comes to the use of technology in class, it might be that we feel overwhelmed with the work we already have. So if it's not compulsory or if it's not part of the requirements for us to obtain our degree, then I feel why should I learn it anyway? So, if I get at[to] a school and find that they use a traditional way of teaching and it seems to be working for them, then that's what I will do.

This statement reflects one participant's perception of learning by making use of technology as well as the utilisation of various technological processes in her lessons. This notion is supported as part of the perceptions of the other five teachers regarding the use of technology in a class as noted by Teo *et al.* (2016:6). This perception is called the “subjective norm” (Teo *et al.*, 2016:6). This is when teachers only deem the use of technology necessary if it is expected by the people and organisations that they view as important (Teo *et al.*, 2016:6). When talking to the participants, it can also be seen that they would rather conform to this notion than try to change it, not because they do not want to, but because they feel overwhelmed by the amount of work that is expected of them.

Another aspect regarding pre-service teachers' perceptions when asked what their first thought was when thinking about lesson planning, they responded with phrases like “Oh no, not this again” and “overwhelmed, I think, initially overwhelmed. And then you just do the step-by-step process and carry on.” Incidentally, participant 1 added and said “I panic a lot every time I have to do a lesson plan”. Another response to this question was “I'd say quite anxious” (participant 5). This shows that at university level, pre-service teachers experience some sort of anxiety regarding lesson planning. This also has a direct effect on their attitude and perceptions towards the use of technology if they are already anxious when starting to plan their lessons. The research done by Teo *et al.* (2016:6) indicates that if teachers feel that using technology will be too much of a

challenge, they tend to avoid it. This notion of anxiety is also supported by McNeill (2005) who states that this can occur when pre-service teachers need to improve their KAL.

Then too, as mentioned under the topic of digital competence, the words “challenging”, “frustrating”, “time consuming” are supported by research done by Teo *et al.* (2016:6) regarding teachers’ perceptions of the use of technology. On the other hand, participants added that they also see the use of technology as “advanced”, “easily accessible” and “convenient” as used at the beginning of the meetings. Teo *et al.* (2016:5-6) state that if teachers had the perspective that using technology in classroom instruction would improve their “performance”, they would use it more frequently. However, the biggest need is not for teachers to use technology more frequently, but more effectively. In the group discussions, it was clear that the participants tend to use the programs they know best, like PowerPoint and YouTube, to prepare and present their lessons while admitting that they feel they lack knowledge on the uses of other technology. Therefore, it is necessary to ask whether these programmes are used effectively enough to enhance critical thinking as well as problem-solving skills of learners in the EFAL classroom.

During the last meeting, I asked the participants to reflect on their journey through this research study and one participant wrote:

I have learned that as UODL student you are not the only one experiencing certain daunting moments like lesson planning and various ICT platforms. I learned that ICT can be used to collaborate and build relationships. I learned how much I respect the other participant's input. Their opinions broadened my perspective.

This viewpoint of a participant changed from a negative- orientated perspective to a positive perspective regarding the use of technology through discussions and collaborative efforts to look for ways to use technology more effectively in lesson preparation and presentation. This was also seen in a study done by Akram *et al.* (2022).

4.3 Pre-service teachers’ adoption and use of technology in their lesson planning and presentation

The research question which asks how pre-service teachers adopt and use relevant technology in their lesson planning and presentation, as well as the themes and codes that were identified regarding pre-service teachers’ use of technology, will now be addressed.

4.3.1 Code: Context

Soon after having the online group meetings, it was noted that one very significant factor continually arose, and this was that the context played such an important part in the lives of the participants as pre-service teachers. The context referred to the classrooms they occupied during their work- integrated learning (WIL) and the context of the learners they taught during their WIL. Of the six participants who took part in this research project, two participants constantly addressed the context that differed regarding the use of technology in their lesson planning, lesson presentation and in their classes. One comment that participant 2 made, was that technology could sometimes get in the way of the teaching phase during a lesson because the learners at the school were not used to technological gadgets “so once they see that kind of gadget in front of them, they get excited and all of a sudden the focus is on the object, the gadget and not the lesson itself”. The participant later stated that this was the reason why she did not include technology in her lesson presentation because the learners tended to misbehave and the lesson resulted in chaos. Among the theme of context, many participants commented and said that not everyone had access to the same resources, and due to this, not all learners were equally exposed to technology and when they suddenly saw technology in a lesson “it can be a huge distraction”. This notion that learners who are not used to technology are easily distracted, is also supported by literature in the studies done by Jordaan (2011), Mentz & Mentz (2002), Fleisch (2008), and Mashile (2016). Literature shows that there are many socio-economic barriers in South Africa and not all learners, schools and teachers have access to the same resources (Fleisch, 2008; Jordaan, 2011; Mentz & Mentz, 2002). The fact that the learners are not used to seeing and using technology in their daily lives, results in teachers not wanting to use technology due to the disruption it causes in the class which leads to misbehaved learners and disciplinary problems.

Added to this, participant 2 later stated that she felt she wanted to “avoid using your own gadgets” because they contained information about the teachers’ personal life and in order to keep a professional image, it is preferred to use the technological tools provided by the school. This feeling is also due to theft that occurs in schools, and this idea is also supported by literature, where Mentz and Mentz (2002) indicate that theft in South African schools is one of the reasons why schools do not have access to technology. As soon as schools install computers and other electronic equipment at schools, they become a potential target for theft (Mentz & Mentz, 2002). This also results in teachers avoiding the use of technology altogether because of the lack of safety in schools.

Moreover, the participants added that they had to consider the context of the learners they were planning to teach very carefully to ensure that they would have access to technology before they wanted to incorporate technological tools into their lessons. As seen earlier, the participants do not want to use technology in their lessons if the learners they are teaching are not familiar with such technology and were to disrupt the class due to this.

Another factor that stood out regarding the context was that technology is expensive and that not everyone (learners, teachers or even schools) can afford to have technology readily available during the lesson preparation phase as well as the presentation during classes. This viewpoint is also supported by Mashile (2016) whose research study focused on the digital divide that is being caused by the socio-economic gap which is present in South African classrooms and corresponds with the research done by Herselman (2003). The participants are therefore unwilling to use technology in their lessons because they have to buy and provide this equipment themselves because the schools do not have the necessary funding to buy computers and other resources for the school. Pre-service teachers then end up using their own computers if they want to incorporate technology into their lessons. This has a negative effect on their willingness to adopt technology in their lesson planning and presentation as they have safety and other factors to consider as well.

At meeting 2, the participants were asked to search for images on Google or take a photo of what their idea of a classroom is. Among the photos that were sent were the following:



Figure 4-1: Participant 7's image of a classroom

The participant commented on this photo in Figure 4.1 and said she liked the fact that everyone is sitting in groups with one computer that is available to be used by the group.



Figure 4-2: Participant 3's image of a classroom

The participant who sent this image in Figure 4.2, stated that she chose this image that represents her idea of a classroom because it is “close enough to collaborate with one another, but you can also have, like, I don’t mean like personal space, but like desk space”.

Another participant sent the following image in Figure 4.3 that represents her idea of a classroom.



Figure 4-3: Participant 5's image of a classroom

When asked why she chose this image in Figure 4.3 she stated that “it is a typical government school”. After asking the participant whether she thought technology could be added to this classroom setting, she stated “[y]es you can, but it’s not easily accessible, but you can add technology” and continued to say that “they [the learners] will be over excited when they see gadgets and stuff, so it would be wise to use it maybe once in a while, not very often”. This notion is also supported by the statement made earlier in this section regarding the context of learners in South Africa and the literature of Fleisch (2008), Jordaan (2011), Mashile (2016), and Mentz and Mentz (2002). This opinion of participant 5 corresponds with the statement participant 2 made when she said that using technology only results in learners misbehaving because they are not used to seeing and using technology. Therefore, the participants feel that they cannot provide all the learners with computers or technological tools, so they will just have to use technology less in the class.

After realising that context is very important, it was decided that asset mapping of the resources that were available for pre-service teachers should be done. The resources were grouped under the following headings: **individuals, organisations/associations, public institutions and services, physical resources** and **economy**. This was to summarise the general resources that were available in the general South African context under the main headings of individuals; the following were listed as knowledge resources that are available in themselves as pre-service teachers which incorporate their skills and experience. They also added that they had time

management skills, a passion for what they do, good communication and listening skills, a body of knowledge (other more experienced teachers) to ask for assistance, they had patience, multi-tasking skills and improvising skills. Under the heading of organisations and associations, SACE, universities, schools, the Department of Education and private organisations were mentioned. Under the heading of public institutions and services, the internet, library services and museums, plants and factories were mentioned as resources. Under physical resources, computers, the CAPS document, textbooks, books and magazines and data completed research studies were listed. Under economy, a wide socio-economic diversity was mentioned as well as the fact that not everyone had access to all these mentioned resources and though there may be very wealthy people there are also very poor people who do not even have access to basic resources to help them fill their basic needs.

Table 4-1: Table of asset-mapping the resources that are available to pre-service teachers

Individuals:	Organisations/associations:	Public institutions and services:	Physical resources:	Economy:
Knowledge, skills, and experience on lesson planning.	SACE	Internet	Computers	Wide socio-economic diversity
Good time management skills.	The university	Library services	CAPS documents	Not everyone has access to the same resources.
Passion for what we do.	Schools where we do our practicals during WIL	Museums, plants, factories, etc.	Textbooks	Some people are very rich, while others do not have access to the basic resources.

Good communication and listening skills.	The Department of Basic Education		Books	
A good body of knowledge to ask for assistance if there's a struggle.	Private school tours organisations		Magazines	
Participants have more patience.			Completed research studies.	
Good multi-tasking and improvising skills.				

The view that these listed resources are not available to all the learners and that there is a digital divide, is also supported by literature (Mashile, 2016) with some schools and learners having access to these resources yet others that do not even have electricity. Mentz and Mentz (2002:193) indicate lists where these resources are missing and state the following: that there is not enough financial support from the Department of Basic Education; there are untrained teachers at schools; there are also schools who do not have electricity, there are time-constraints regarding the inclusion of technology in the curriculum, there are also overcrowded classrooms; there is a lack in buildings and space at schools and when there is a room available, it is not suited for house computers (Mentz & Mentz, 2002).

Another aspect that stood out when looking at the context, was that there is a tendency among certain learners in certain traditions that attach a sort of bad stigma to having knowledge of something and learners will mock one another if one shows that he can do something or succeed in something in class. Participant 7 stated that this was something she saw often; that “learners see that if you can do something, you are being mocked”. This stigma is one that needs to change not only for the learners, but for the learners who become teachers as well as the teachers in

these settings. This stigma that occurs among learners in schools, also occurs among teachers in schools because this problem is not addressed at school level. Teachers have the idea that we live in a technological era where everyone just needs to know technology, resulting in them not having the confidence to ask for help and assistance with technology. Addressing this stigma will also enable teachers to model their self-directed learning and reflective practices to their learners and break ideas down that feed this stigma.

4.3.2 Code: training

Another theme that stood out was that the participants felt that they needed more training in the use and incorporation of technology into their lesson planning and instruction. Participant 1 and 6 indicated that they preferred to look for information on the internet to “help me where I don’t understand”. This notion directly links to the need for technology-training programs for teachers, as the participants acknowledge that in themselves they lack the necessary knowledge on how to use technology in their lesson planning and presentation. While designing the fishbone analysis, a possible cause for pre-service teachers not using technology in lesson planning and presentation is the fact that they need training in “how to apply it in cooperative learning” as well as on choosing “appropriate” tools, programs and applications. These viewpoints are supported by literature which focuses on the need for correct and effective application of technology for classroom activities (Lisa *et al.*, 2021:157; Mishra & Koehler, 2006:1018). The participants, therefore, admitted that they not only lacked the knowledge on how to use technology in their lessons but also how to apply the use of technology in the class. This resulted in their not knowing how to use technology effectively in their lessons.

In another instance, the participants indicated that they found it difficult to choose the correct type of programs, applications and tools to use and also struggled to determine which level of understanding the learners were on. This concept/situation was one that was seen as a gap by Hamilton (2018) who used Bloom’s Taxonomy to match up the technological activities. This indicates the need to identify the level of understanding which the learners have in order to use the technology effectively. This adds to the previous notion that the participants feel that they do not have the necessary knowledge of how to use and incorporate technology in their lessons, so therefore that explains the urgent need for technology training programs to equip pre-service teachers with the necessary knowledge of the use and incorporation of technology in their lessons.

Another aspect that surfaced under teacher training was that the participants saw in-service teachers while they were on their WIL and realised that they were constantly helping one another

if they did not understand something that involved technology; in other instances, participants reported that if there was an in-service teacher who could work with technology (e.g. creating reports), he/she would be tasked with doing the work that related to technology. This also added to the “willingness to learn” aspect that was identified during the design of the fishbone analyses. Literature supports this notion that teachers tend to avoid the use of technology altogether if they deem it too difficult (Teo *et al.*, 2016:6).

4.4 Ensuring the teaching moment is included in the EFAL lesson using the TPACK model

The research question which asks how pre-service teachers can ensure that they include the teaching moment in their EFAL lesson using the TPACK model (as well as the themes and codes that were identified) will now be addressed.

4.4.1 Code: lesson planning

Regarding the theme on the use of technology in lesson planning, the participants stated that they like to use their cell phones to look for information about the lesson content when planning a lesson. They also indicated that they look for creative activities and images on the internet. They would then use these to show to their learners. During the design of the fishbone analysis, participants stated that it was time-consuming to plan to use technology in the classroom because they had to search for the correct tools and applications that could be used to fit in with the content of the lesson. This inclination/complaint of a lesson-planning being time-consuming is also supported by research done by Asan (2002:226) and Beschorner and Kruse (2016:258). The participants in the study done by Beschorner and Kruse (2016:265) stated that using technology took “chomps” from their time.

Participants also stated that due to technology not working in many cases when they needed it to work, was important to “practice beforehand because half the lesson might be gone if there’s a double adapter not available”. Other participants added that it was important to have a back-up plan in place in case technology did not work during a lesson. This would take up even more time and might result in teachers not utilising the teaching moment optimally during the lesson, due to these time-consuming preparations. This would result in time lost during the teaching moment as pre-service teachers needed to put extra time in during their lesson planning and also time wasted in class if technology failed them. It is also necessary to mention here that if they had enough knowledge about the use of technology, they would also know how to avoid those problems and/or handle them once they arose.

Furthermore, while creating the graphic organiser in the form of a mind-map, the participants were asked with which aspects regarding the EFAL lesson planning they were struggling. Their responses included that they struggled to design the lesson plans quickly, to think of creative activities, to connect the dots between different sections in the lesson, to make sure that the lesson was integrated to create a SMART task and to know which assessments to use in the lesson. These aspects mentioned by the participants, were simply put, part of lesson planning. Uys *et al.* (2020) postulate that taking the time to plan properly will result in better lessons. Additionally, Uys *et al.* (2020) see solving the gap of connecting the dots in lesson planning by creating the lesson wheel (backward design) to ensure that all the lesson facets are aligned during the planning phase of a lesson. The participants experience these struggles without the use of technology which makes the integration of technology into their lessons an even bigger task as they not only need to plan the lesson, but to learn how to use technology and do it effectively at the same time. This adds to the problem which they are experiencing in technology integration in their lesson planning and presentation.

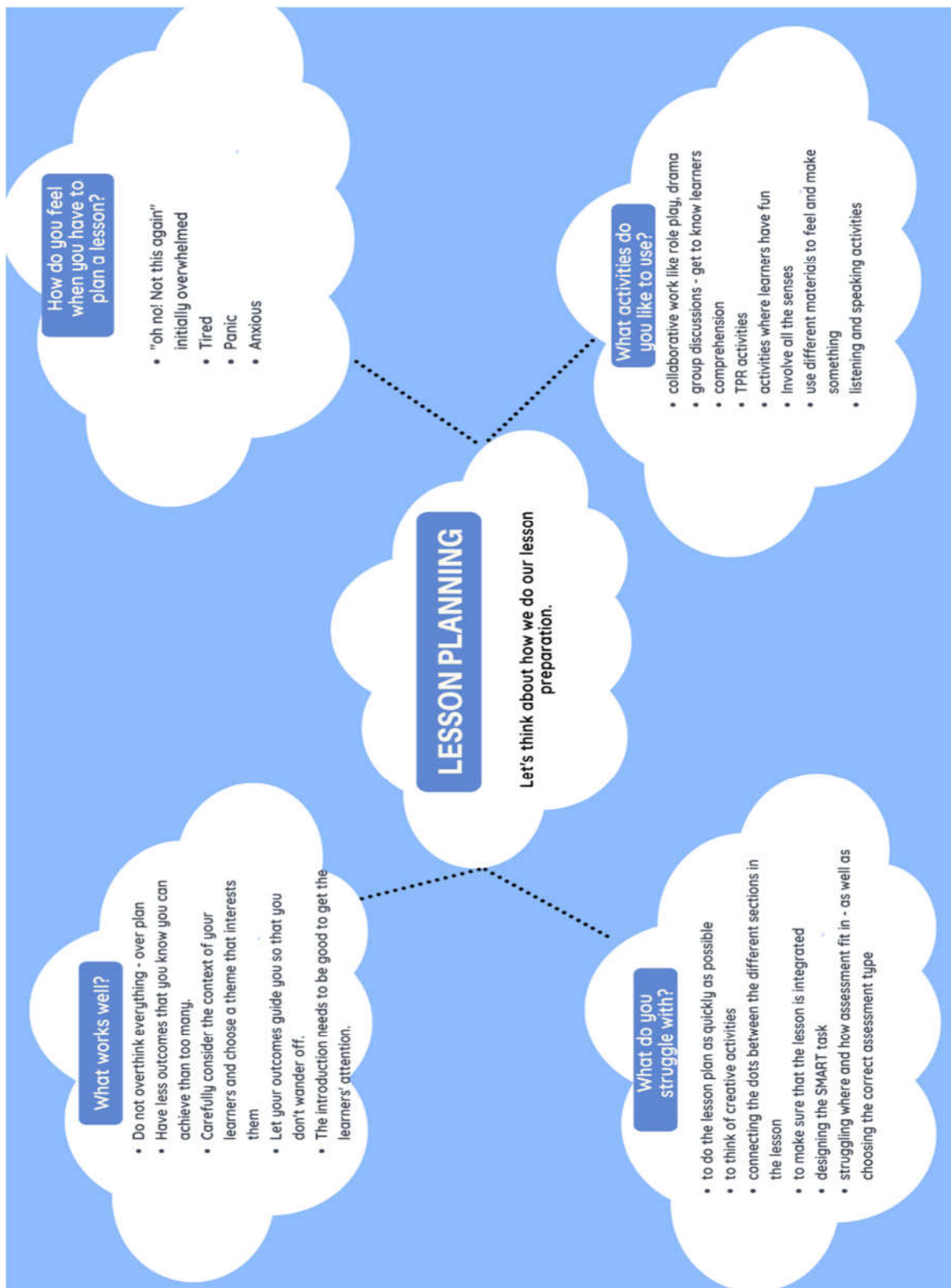


Figure 4-4: Lesson planning graphic organiser

4.4.2 Code: teaching moment

The context of the learners and the school have a direct link with the use of technology during the teaching moment in a lesson. In one meeting, participant 2 stated that she wanted to use technology during her lesson and “test how my learners would behave” and see whether they would “cope using the internet on their own”. After sharing the internet site with them and starting the lesson, she realised that “most of them did not even know what Google is, and those who knew did not know how to follow the link and stuff”. The participant then stated that she realised in that lesson that a teacher needs to be “hands-on” and needs to “prepare your learners first so that they know what they are using or what they are dealing with because they might go to a site and there is a lot of pop-ups with adverts and stuff and then they just get overwhelmed and then lose interest altogether”. She then continued to stress the importance of the teacher to guide the learners in the use of technology during the teaching moment. Literature supports this view of learners in South African who do not have exposure to technology and the use of it (Mashile, 2016). Besides, it is necessary for the teacher to do research on the context of the learners before engaging in classroom instruction in order to link the content with the learning experiences of the learners (Uys *et al*, 2020; Wiggins & McTighe, 2011).

Then too, the participants stated that they liked to incorporate technology in their EFAL lessons that provides opportunities for listening and speaking as well as the use of comprehensions. Hamilton’s (2016) research supports this viewpoint and suggests many different tools and technological features that can be used with Bloom’s Taxonomy to provide the learners with the necessary subject- specific learning- opportunities.

Another aspect that surfaced was the fear of learners not knowing how to use technology and that it would make teachers too nervous to incorporate technology because they feared it would “take up most of their lesson time”. This notion is one that is also supported by Mentz and Mentz (2002:193) who claim that there is already a time constraint in the curriculum. The participants’ inkling regarding the fear of time being lost also related to learners’ limited exposure to technology in certain South African school contexts (Jordaan, 2011; Mashile, 2016; Mentz & Mentz, 2002). When referring to the previous statement it is obvious that teachers need to start to use technology in their lessons and model the use thereof to their learners. If teachers do this from an early grade, learners would already be more exposed to technology and be confident to use it themselves. This will also decrease the bottle-necking of problems that occur at a later stage.

Participants also stated that when it came to the teaching moment, it was important to teach content that is “relevant and match your learning outcomes”. This is also supported by Uys *et al*.

(2020) where the lesson outcomes are aligned with the teaching moment in the backward design of the lesson wheel.

Incidentally, a participant commented and said that by incorporating technology into the teaching moment, the teacher was also “showing them what’s going on in the real life” and by asking questions of learners during the teaching moment, while using technology, learners would develop critical thinking and problem-solving skills. Together with this, participants stated that “sometimes you can use the teaching moment to enforce your teaching moment”.

Another aspect participants mentioned, was the need for “guided practice” when using technology during the teaching moment. The importance of guiding the learners through the use of technology during the teaching moment was emphasised and mentioned a few times during the group meetings.

Furthermore, during the designing of the graphic organiser in the form of a mind-map, the participants were asked which activities they liked to use during their EFAL lessons. They responded with activities that promote collaborative work like role-play, group discussions, comprehension activities, total physical response activities, activities where learners have fun and involve all their senses as well as listening and speaking activities. These activities are also mentioned by Hamilton (2016) when using technology in classroom activities.

Fishbone Analysis

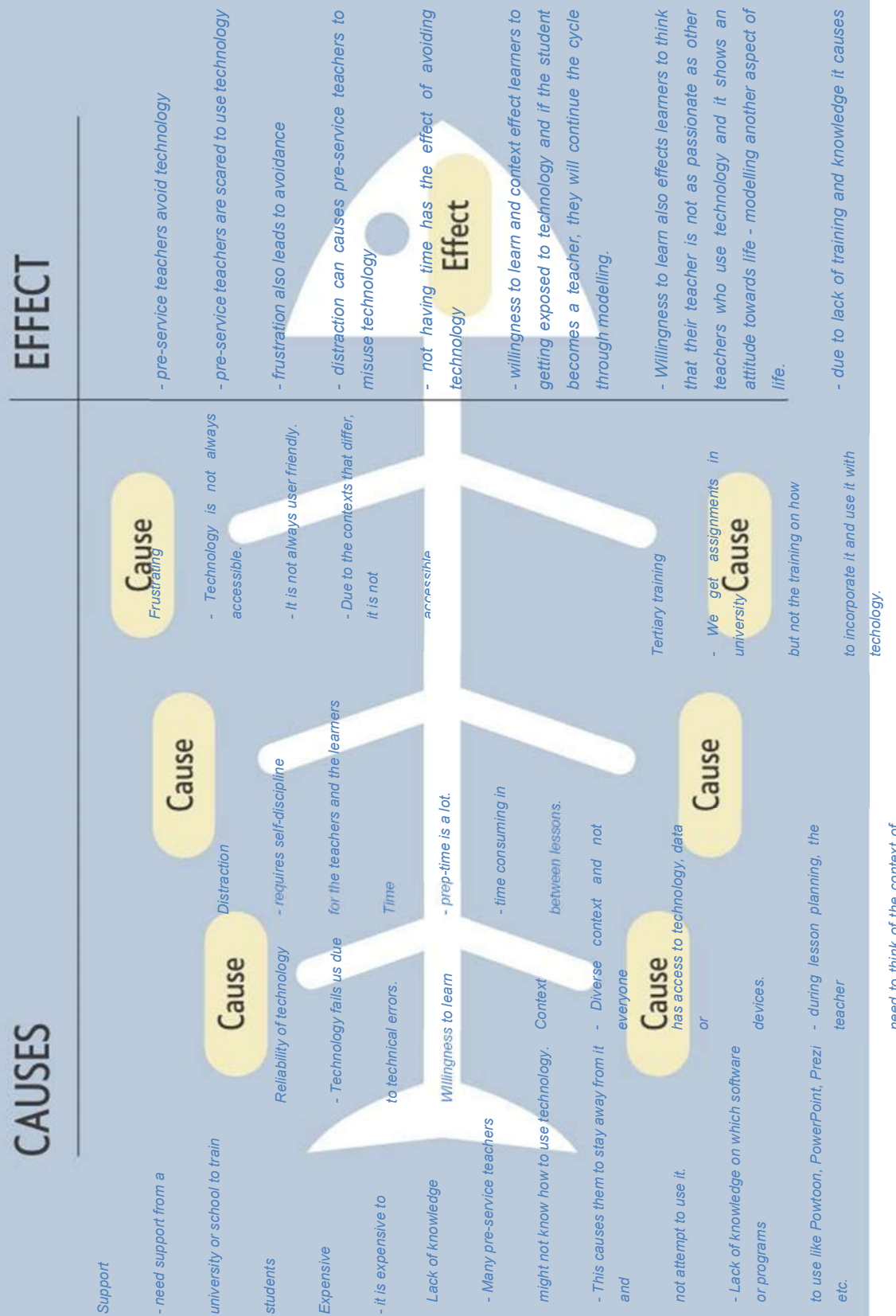


Figure 4-5: Fishbone analysis

4.5 Summary

Among the final reflections on the last Padlet, were the following comments:

I feel that I've grown a lot since we started working on the intervention plans. I also learned new things like how important teacher context is during lesson planning and presentation. I also learned how valuable teamwork is and how grateful I am to be able to work with such talented group of people.

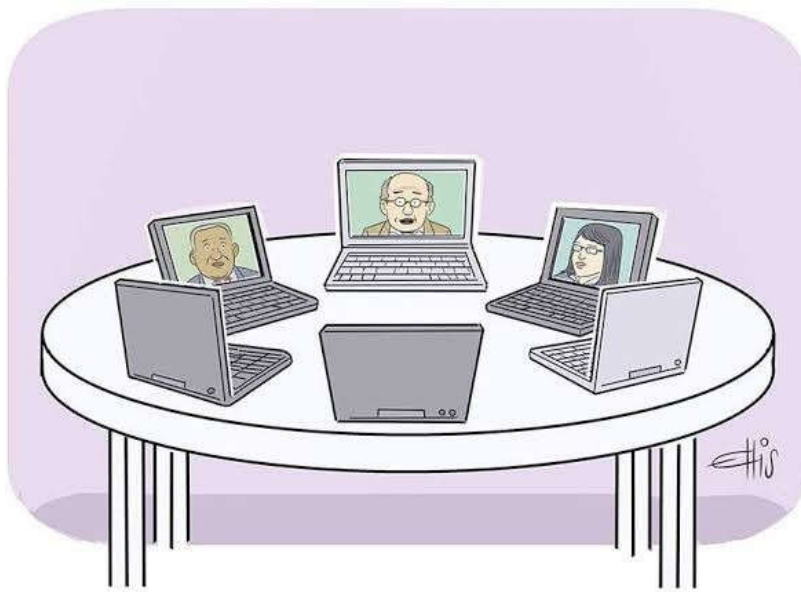
The session have been insightful. I got the opportunity to learn from the team members and explore new possibilities of what I can do to make teaching and learning in my future class more fruitful. Engaging with members of the team in different context and sharing experiences has made me a better person. It has really been a great experience.

Thereafter, I asked the participants to take a photo or search for a photo on the internet that best represented their experience in taking part in this research project. Among the photos that the participants sent, were the following.



Figure 4-6: Photo of participants 2

The caption for this photo said: "Happily surprised by the new knowledge I gained and excited to implement it in teaching practices."



"Who called this meeting again?"

Figure 4-7: Photo of participant 4

The caption that accompanied this image says: "Got to use and know how to incorporate technology in my lessons."

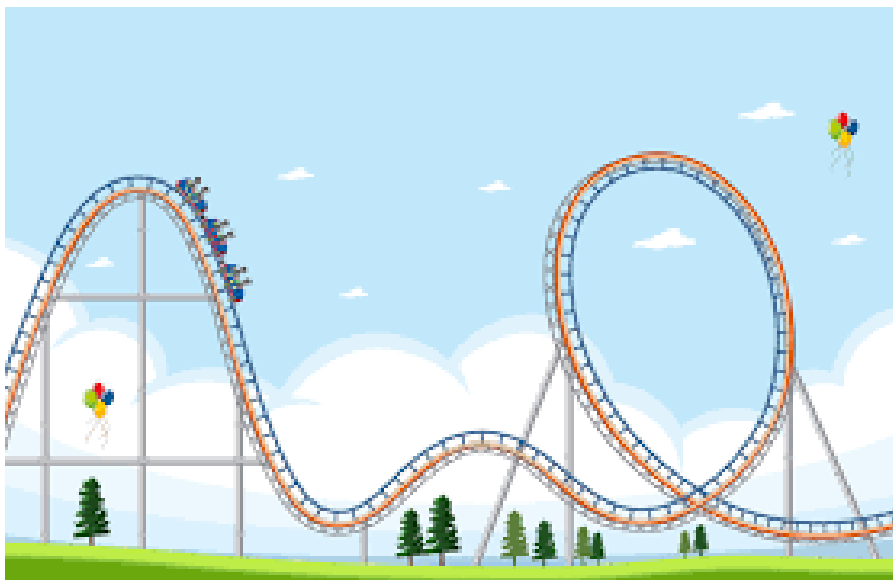


Figure 4-8: Photo of participant 7

The caption that accompanied this image says: “Taking part in this research project was like a roller coaster ride. It had its ups and downs, but at the end you climb off and say ‘I want to do that again!’”.



Figure 4-9: Photo of participant 3

The caption that accompanied this image says: “I've been learning a lot, from different people. It was really insightful to learn or understand other people's perspectives.”



Figure 4-10: Photo of participant 5

The caption that accompanied this image says: “It was a fun-empowering and enlightening experience. It is crazy fun learning. Felt like a first day at school, learning new things that makes one go woooooow....”



Figure 4-11: Photo of participant 1

The caption that accompanied this image says: *“Being part of the Masters Study focus group was eye opening. The other participants have given me the opportunity to see learning and teaching in different contexts, and to apply this in practice. I have learned the value in using technology in the classroom and that it enables one to be a life-long learner. I think in today’s day and age it is vital to incorporate it into the curriculum.”*

Through these photos and images of participants, it can be seen how important it is to engage in collaborative work with others to look for answers to problems everyone is experiencing. It can also be seen how these participants grew in their willingness to engage and learn about technology and how their participating in this PALAR study made them reflect on their own teaching practices and think about the way they view the use of technology as well as how effectively they can incorporate it into their lessons.

CHAPTER 5 LESSON PLANNING AND PRESENTATION

GUIDELINES, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In the previous chapter, several challenges were identified which needed intervention surrounding participant detachment and how to reduce it. This chapter will focus on answering and providing possible solutions and guidelines to the research questions of this project, which are: What are pre-service teachers' understanding and conception of technology?; How do pre-service teachers adopt the use and incorporation of technology in their lesson planning and presentation?; and How can pre-service teachers ensure that a teaching moment is included in their EFAL lessons using the TPACK model?

5.2 Pre-service teachers' perceptions of technology

In Chapter 4, it was seen that the participants are mainly positive in using technology but state that they feel they lack knowledge and are often frustrated and unsure when using technology.

As seen in Chapter 2, the SAMR model provides four approaches in "selecting, using and evaluating technology" in classrooms. PuenteDura (2013) provides (in figure 5.1) how TPACK and SAMR can be used to illustrate how these two models can be combined to ensure that the type of technology that is chosen, aids the pedagogical and content areas of a lesson. He also provides a diagram of programs that can be used in classrooms that fit into the TPACK and SAMR model as seen in Figure 5.2.

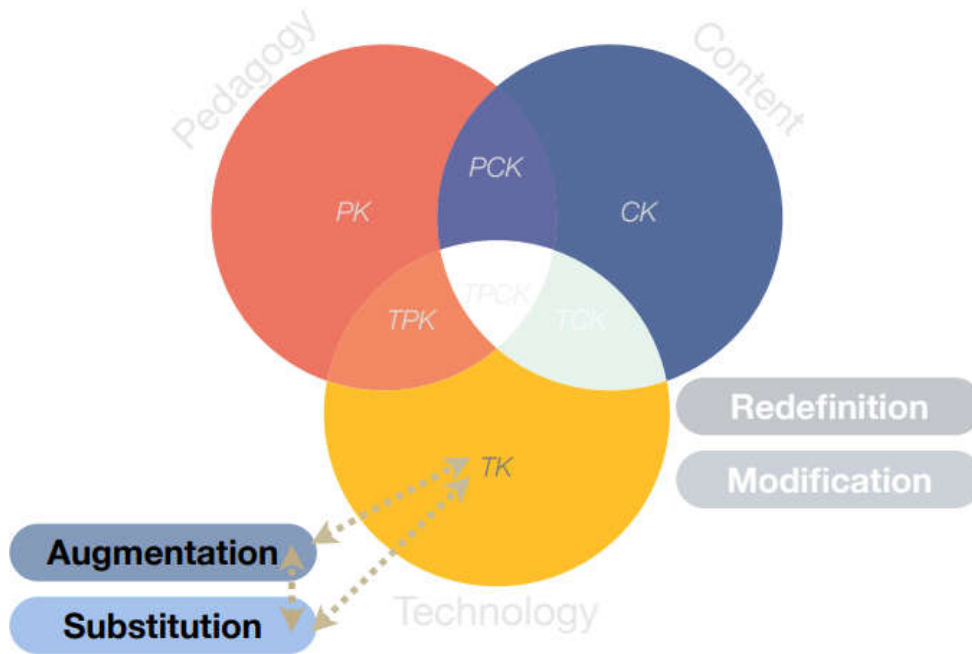


Figure 5-1: A combination of the SAMR and TPACK models

(Source: Puentedura, 2013)

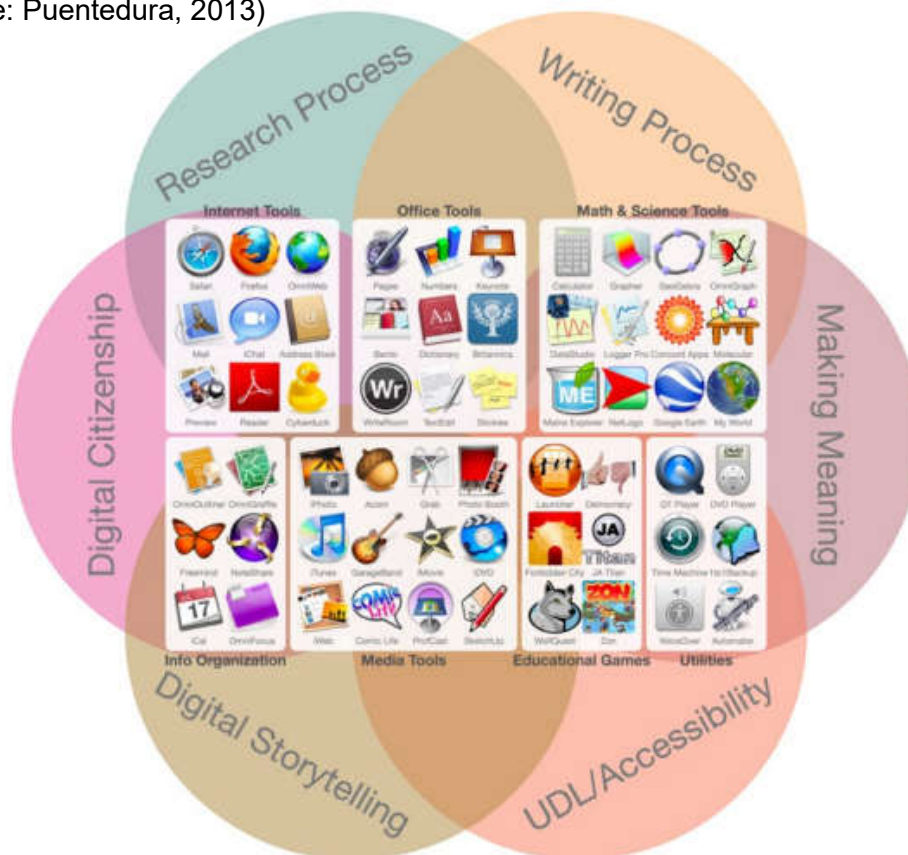


Figure 5-2: Programs that can be used while combining the SAMR and the TPACK models

(Source: Puentedura, 2013)

Figure 5.2 illustrates how the TPACK model and the SAMR model are intertwined to provide resources that learners and teachers can use in the classroom to help them with digital citizenship, the research process, the writing process, meaning making, accessibility, and digital storytelling (Puentedura, 2013).

5.3 Pre-service teachers' adoption and use of technology in their lesson planning and presentation

When looking at the data found in the previous chapter, a table was created to indicate what challenges pre-service teachers experienced regarding the use and adoption of technology in their lesson planning and presentation. The reasons for these problems and possible solutions to these problems are also addressed in the following table.

Table 5-1: Table of identified problems, reasons, and possible solutions.

The problem that was experienced.	Reasons for the problem.	Possible solutions to the problem.
Using technology in the class causes chaos.	There are different contexts in South Africa and not all the learners have access to technology. Learners in rural areas who do not have access to technology get too excited when they see or use technology because it is new to them.	To integrate technology from earlier grades to expose learners to technology; change the educational context in South Africa to ensure that more schools have access to these resources. This is supported by research done by Sharkins et al. (2016), who claim that when young children are exposed to technology (MeTS), it will have a positive effect on their technological use.
Teachers using their own resources.	Many schools are too poor and do not have access to resources like computers. Teachers then use their	Raise awareness at the DBE about the necessity for resources and safety in schools to ensure

	personal computers to incorporate technology in their lessons.	education and exposure to technology for all South African learners by addressing these at meetings, discussions, in correspondence, etc.
Technology is expensive.	Schools do not have the necessary finances to buy resources like computers.	Again, a call to the DBE, as well as the private sector and all citizens to assist and support schools in receiving the resources they need to provide learners with quality education.
Stigmatising of achievements.	Many learners have a stigma regarding other learners who accomplish something and succeeds in educational efforts, specifically related to technological/digital literacy.	Teachers should focus on breaking this chain of thought in learners by modelling achievements and accomplishments, gaining knowledge on how to work with technology in the classroom. Learners need to see the bigger picture and start considering their future. Teachers can support and acknowledge positive learning attitudes and discourage negative attitudes from an early age.
Need for technology training for teachers.	The participants indicated that they lack the necessary knowledge to work with technology successfully	Pre-service teachers need to receive training on tertiary level on how to use technology in their lessons and how to apply the

	and incorporate it in their lessons effectively.	knowledge they have gained to ensure that they model the use of technology to their learners and incorporate it effectively to enhance critical thinking and problem-solving skills of their learners.
Pre-service teachers do not know which programs to choose.	The participants indicated that they do not know which programs to use to incorporate in their lessons or how to use them.	Teachers should be trained on how to use different programs integrated with self-directed learning endeavours to learn about technology and the different programs. They can consider tools like the pedagogy wheel by Allan Carrington (2016), which shows which programs can be used to teach at the different levels of Bloom's taxonomy. There are also other resources available such as the book of Jennifer Gonzalez (2022) <i>Teacher's guide to tech</i> that provides a lot of information on which programs to use during teaching.

In an attempt to help and guide pre-service teachers, the pedagogical wheel which is based on the SAMR model and designed by Carrington (2016) can be used in combination with the different segments of the lesson wheel to help support pre-service teachers in their decisions on which programs to include in their lesson planning segments, which is simultaneously aligned with Bloom's taxonomy. This will help teachers to scaffold activities according to Bloom's taxonomy, normalise technology, self-directed learning and learning strategies in classrooms, and learn more about the programs that are suggested in the pedagogy wheel (see Figure 5-3). Teachers can also start identifying more specific areas where they need additional training and report this to organisations like SACA and the DBE. Additionally, they can do research studies to help create training programs for other teachers.

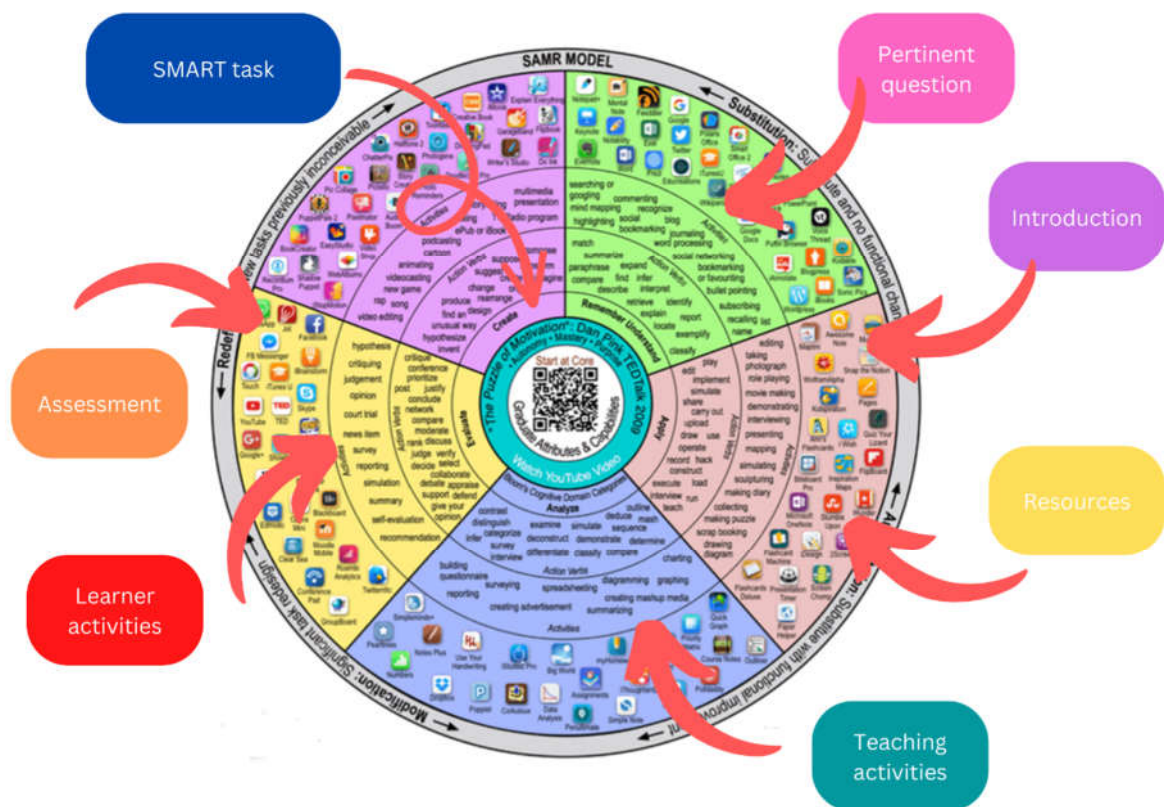


Figure 5-3: Lesson wheel (Uys et al., 2020) integration with the pedagogy wheel by Carrington (2016)

Figure 5.3 shows how the pedagogical wheel of Carrington (2016) can support the lesson wheel and provide pre-service teachers as well as in-service teachers with the necessary resources to support every phase of the lesson plan.

The inner wheel supports the SMART task as it indicates the levels of Bloom's taxonomy. The provided programs by Carrington (2016) support the learner activities, teacher activities, introduction, pertinent questions, and assessments. The learner and teacher activities are also supported by the provided list of activities in the different levels of Bloom's taxonomy. This model acts as a tool for teachers to start taking action and put in effort to learn more about technological programs that can improve their teaching in class. This model combines the scaffolded activities with certain programs, which aligns teachers' learner activities and outcomes. The model further ensures that the use of technology is more goal orientated and ensures that the outcomes are met with the successful implementation of technology.

5.4 Ensuring the teaching moment is included in the EFAL lesson using the TPACK model

The guidelines suggested by the participants of this research study aimed to help answer the research question: How can pre-service teachers ensure that a teaching moment is included in their EFAL lessons using the TPACK model?

To answer this question, the participants first spent time to determine and examine the problem of the notion that pre-service teachers tend to use technology ineffectively while planning and presenting a lesson or leave the teaching moment out altogether. To ensure that pre-service teachers include the teaching moment in their lessons, the following guidelines were provided.

The guidelines are divided into three phases:

Phase 1: Before teaching

During this phase, it is first necessary for the pre-service teacher to ask: *What* am I teaching?; *Who* am I teaching?; *When* am I teaching it?; *How* am I teaching it?; and *Where* am I teaching this?. The "*what*" refers to the content and subject pattern that is being taught as well as the incorporation of the EFAL CAPS. This related to the type of technology that is going to be included in the teaching moment of the lesson. By asking "*what*", the lesson objectives and outcomes should be kept in mind to ensure the teaching moment focuses on reaching these goals. This is where the pre-service teacher needs to determine which programs, tools and resources will be used. Hamilton (2016) provides suggestions on which technological tools and applications can be used in teaching English.

The "*who*" refers to the context of the learners. It is important for pre-service teachers to determine who the learners are and what their capabilities in terms of technology use, academic

literacy and social setting are. This will allow the pre-service teacher to ensure that the teaching moment is applicable to the learners.

The “*when*” refers to the time, duration as well how long it will take to teach learners the content through the use of technology. This is to determine whether there is enough time available to teach the specific content and to ensure that the use of technology in the teaching moment supports the time available and do not waste time.

The “*how*” relates to the method of explicit instruction during the teaching moment and how technology can aid in the instructional phase and prevents a distraction or for technology to end up being an entertainment tool for learners.

The “*where*” relates to the physical classroom and what resources are available as well as where in the curriculum the learners are. This is to use technology more goal-orientated in the EFAL classroom.

Phase 2: While teaching

This phase is the actual explicit teaching moment, and the pre-service teacher needs to ensure that the technology that is being used, is used through guided practice to lead the learners to ask “*why*” and “*how*” when using technology in the explicit teaching moment. Technology needs to lead to learners wanting to know more and elicit curiosity to want to go and do research to know more on the content that is being taught.

Phase 3: After teaching

During this phase, the pre-service teacher needs to reflect on the explicit teaching moment and ask *What* worked during the lesson?; *Who* worked?; and *How* did it work? The “*What* worked” refers to the actual teaching moment and technology that was used and whether it elicited interest in the learners to ask “*why*” and “*how*” during the teaching moment with the use of technology. The “*who*” refers to the actions and activities of the teacher and the learners during the explicit teaching moment. This is to ensure that the teacher taught the content and subject matter and that the learners were active participants in this learning phase. The “*how*” refers to the whether the teaching moment using technology was effective and successfully used to reach the learning objectives and outcomes of the lesson that were determined before the teaching phase. After answering these questions, the pre-service teacher then needs to be willing to change and adapt the teaching moment with the use of technology to ensure that it is used more effectively when the process starts again for the next lesson.

Figure 5.3 is a graphic representation of the guidelines to include the teaching moment with the use of technology in an EFAL classroom.

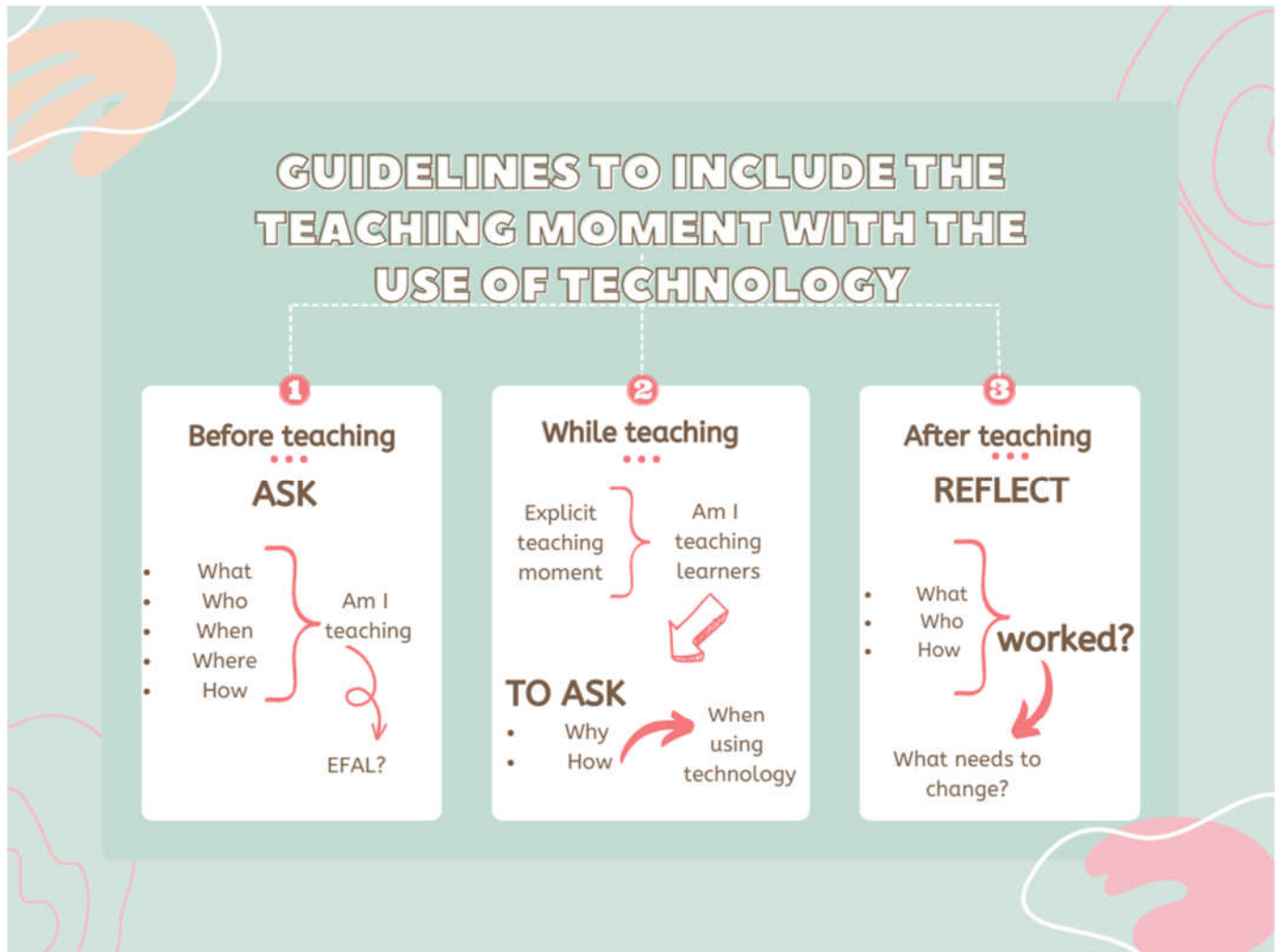


Figure 5-4: Guidelines to include the teaching moment with the use of technology

5.5 Limitations and future actions

Participatory action research is a powerful research methodology and creates an opportunity to solve problems. However, there are some limitations that need to be kept in mind while conducting action research.

Firstly, it might be difficult for the researcher to earn the trust of participants (Chouinard, 2013:247; Ebersöhn *et al.*, 2016:147). For the researcher to win the trust of participants, it is necessary to spend ample time with them, which might hinder the research process and require extra time to look for new creative ways to earn the trust of the participants (Chouinard, 2013:247; Ebersöhn

et al., 2016:147). There were also time and resource constraints in completing this research project.

Secondly, load shedding up until stage 5 was experienced which made it very difficult for the participants to attend meetings and when they did, we had to struggle with connectivity problems.

Thirdly, action research relies on a certain group of participants or community in which findings are found, which affects the “transferability” and generalisation of the research findings (Ebersöhn *et al.*, 2016:148). There was also only one set of six participants which made it difficult to get a broad idea of perspectives.

Future recommendations include designing a course or module for pre-service teachers based on the TPACK model to sufficiently prepare future teachers to effectively use technology in their classrooms. Future research can be done by including in-service teachers and the lecturers who train these students to collaborate and work on courses that can be included in teacher training programs. The DBE can also be asked to be involved in future studies as many of the challenges relate to them.

5.6 Summary and overview of chapters

In this research study, the following chapters were provided and addressed to answer the investigated problem at hand which was to determine how pre-service EFAL teachers use their digital competencies in lesson planning and presentation as well as what their perceptions are, how they adopt the use of technology, and how pre-service teachers can ensure they include the teaching moment in their classroom instruction.



Figure 5-5: Overview of chapters

5.7 Conclusions

I would like to conclude this research study with the words of John Dewey:

“If we teach today’s students as we did yesterday’s, we are robbing them of tomorrow.”

It must be part of the teachers’ natural instinct to reflect on every action taken before a lesson is presented, while it is being presented and after it has been presented. If, we as teachers, apply this reflective attitude in our daily lives we cannot do anything else than improve on our former actions.

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ANNEXURES

ANNEXURE A: RESEARCH STUDY ADVERTISEMENT

Be part of a PALAR (Participatory action learning and research) study that wants to find new ways for teachers to use technology and ensure there is a teaching moment in your lesson!

Scan this QR code for more information or click on this [HERE](#)



DO YOU WANT TO
LEARN MORE ABOUT USING
TECHNOLOGY IN YOUR
LESSONS?
IMPROVE YOUR TEACHING
MOMENT IN SIMULATED
TEACHING?

March
2022

If you take part in this study you will receive 200MB data for each meeting you attend and a R300 Takealot voucher at the end of the study.

This is a postgraduate study done at North-West University

5 Weeks	Max 10 sessions	Online meetings
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Alternatively contact: tarienbreytenbach@icloud.com or WhatsApp 0791941294

ANNEXURE B: GOOGLE FORMS INFORMATION AND CONSENT

Link to Google Form: https://docs.google.com/forms/d/e/1FAIpQLSfWNhbYhVMetAINpKc4T-3dc0gDErF1aZ10O0qYOqHS9as9uw/viewform?usp=pp_url

Information

Dear Student

You are being invited to take part in a research study that forms part of Ms Venter's Masters study. Please take some time to read the information presented here, which will explain the details of this study. Please ask the Principal Investigator or Ms Venter if you have any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about, and how you might be involved. Also, your participation is entirely voluntary and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee (NWU-EMELTEN-REC) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

- ☐ We plan to work together in groups and look for ways teachers can use technology more effectively in the English first additional language classroom.
- ☐ This study will be conducted on an online platform such as Google Teams and will be done by experienced researchers trained as teachers.
- ☐ Ten participants will be included in this study.

Why have you been invited to participate?

- ☐ You have been invited to be part of this research because you are a third or fourth year BEd student with English as main subject.
- ☐ You will unfortunately not be able to take part in this research if you do not offer English as main subject.

What will be expected of you?

- ☐ You will be expected to participate in five online 50 minute meetings via Google Teams. One meeting will be held per week that will address different aspects during each meeting. More meetings may be held until satisfactory guidelines for teachers using technology in their English first additional language lessons have been designed. You will also be expected to take photos of your views and perceptions of technology use in classrooms. This method is called photo-voice. These photos will then be analysed and discussed during group meetings. You will also be expected to keep a reflective journal of your own use of technology in your lesson preparation and lesson presentations.

Will you gain anything from taking part in this research?

- ☐ The gains for you if you take part in this study will be to participate in a study that provides new guidelines that can help other teachers to use technology effectively in their lesson preparation and presentation, as well as to develop your own knowledge and skills as a prospective teacher.
- ☐ The other gains of the study is to grow as a prospective teacher and become equipped to use technology effectively in lesson preparation and presentation.

Are there risks involved in you taking part in this research and what will be done to prevent them?

- ☐ The risks to you in this study are minimal.
- ☐ The risk of COVID-19 infections is mitigated because no face to face contact sessions will be held.
- ☐ There are more gains for you in joining this study than there are risks.

How will we protect your confidentiality and who will see your data?

- ☐ Anonymity of your data will be protected by not using your real names in the research study, as well as not sharing any personal details of you including your name, telephone number or address with anybody not involved in the research. Only the researchers will be able to look at your data. Your privacy will be respected by using pseudonyms and not your real in the research report... Data will be kept safe by locking all hard copies in locked cupboards in the Principal Investigator's office and electronic data will be saved on password protected computers. As soon as audio data has been transcribed it will be deleted from the recorders. Data will be stored for five years after which it will be destroyed by the Principal Investigator.

What will happen with the data ?

- ☐ The data of this study will only be used for the purposes of this Master's study.

How will you know about the results of this research?

- ☐ We share a summary of the findings electronically with you after the completion of the study.
- ☐

Will you be paid to take part in this study and are there any costs for you?

Yes, you will receive a R300 Takealot voucher at the end of your participation and 200MB of data will be given to you for every online meeting when you decide to take part in this research study.

There will thus be no costs involved for you, if you do take part in this study.

Is there anything else that you should know or do?

☐ You can contact Erika (SFA) Venter at 0724769930 if you have any further questions or have any problems.

☐ You can also contact the North-West University Education, Management and Economic Sciences, Law, Theology, Engineering and Natural Sciences Research Ethics Committee via Mrs Villera le Roux at 018 299 1707 or villera.leroux@nwu.ac.za if you have any concerns that were not answered about the research or if you have complaints about the research.

* Required

By signing below, I (Name/s and Surname) agree to *
take part in the research study titled: Pre-service English first additional language teachers' digital competencies in lesson planning and presentation I declare that:-
• I have read this information in a language with which I am fluent and comfortable.
• The research was clearly explained to me.
• I have had a chance to ask questions to the researcher and all my questions have been answered.
• I understand that taking part in this study is voluntary and I have not been pressurised to take part.
• I may choose to leave the study at any time and will not be handled in a negative way if I do so.
• I may be asked to leave the study before it has finished, if the researcher feels it is in the best interest, or if I do not follow the study plan, as agreed to. Please click the consent button, should you decide to participate in the study and fill in the information on the next page.

Your answer

Information

If you want to take part in a participatory action research Masters research study, please fill in your information. Please read the description of this study first and what will be expected of you as a participant.

This study is completely voluntary

- You will be part of a group of 10 other participants
- We will work together in finding guidelines that will help teachers to use technology correctly in their lesson planning and presentation
- The title of the research study is: Pre-service English first additional language teachers' digital competencies in lesson planning and presentation.
- Your information will not be shared with anyone
- Meetings will occur online via Google Teams
- Meetings will be for 5 weeks with one meeting per week
- Meetings will be a maximum of 60 minutes
- You will receive 200MD of data for before every online meeting
- You will receive a R300 Takealot voucher the same day of the last meeting.

If you have any other questions, please contact the third-party representative:

tar.enbreytenbach@icloud.com

Name and surname *

Your answer

Email *

Your answer

Address *

Your answer

Phone number *

Your answer

Any other comments or questions?

Your answer:

Get link

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Google Forms

ANNEXURE C: ETHICAL APPROVAL LETTER



Private Bag X0001, Potchefstroom
South Africa 2520

Tel: +2710 299 1111/2022

Web: <http://www.nwu.ac.za>

North-West University Education, Management
and Economic Sciences, Law, Theology,
Engineering and Natural Sciences Research
Ethics Office (NWU-EMELTEN-REC)

tel: +2710 299 4707

Email: ethics.mgmt@nwu.ac.za

20 January 2022

Dear Prof Kaiser

APPROVAL OF YOUR RESEARCH ETHICS APPLICATION BY THE NWU-EMELTEN-REC

Ethics number: NWU 01068 21 S2

Kindly use the ethics reference number provided above in all correspondence or documents submitted to the NWU-EMELTEN-REC secretariat.

Study title: Pre-service English first additional language teachers' digital competencies in lesson planning and presentation

Primary Investigator: Prof Katie Kaiser

Student: Mr. Susanna Emrika Aleke Venter

Application type: Single study

Risk level for participants: Minimal Risk

You are kindly informed that your application was re-reviewed and approved and will be formally ratified at the NWU-EMELTEN-REC meeting to be held on 7 February 2022.

The commencement date for this study is 21/01/2022 and is dependent on fulfilling the condition stipulated below. Continuation of the study is dependent on the receipt of a twelve-monthly monitoring report and the concomitant issuing of a letter of continuation up to a maximum period of one year when extension will be facilitated during the monitoring process.

Condition:

1. The commencement and execution of the study are subject to the prevailing COVID-19 restrictions and regulations and must strictly adhere to the prescribed COVID-19 research procedures and protocols.

After formal ethical approval:

Translation of the informed consent document into the languages of the study participants should be submitted to the NWU-EMELTEN-REC (if applicable).

The NWU-EMELTEN-REC requires immediate reporting of any aspects that warrants a change of ethical approval. Any amendments, extensions or other modifications to the proposal or other associated documentation must be submitted to the NWU-EMELTEN-REC prior to implementing these changes. Any adverse/unexpected/unforeseen events or incidents must be reported on either an adverse event report form or incident report form.

A monitoring report must be submitted within twelve months of approval of this study and before the year has expired, to ensure timely renewal of the study. A final report must be provided at the completion of the study or the NWU-EMELTEN-REC must be notified if the study is temporarily suspended or terminated. The monitoring report template is obtainable from the NWU-EMELTEN-REC Office at Ethics.EMELTEN.men@nwu.ac.za. Annually a number of studies may be randomly selected for an external audit.

Please note that the NWU-EMELTEN-REC has the prerogative and authority to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process.

Please note that for any research at governmental or private institutions, permission must still be obtained from relevant authorities and provided to the NWU-EMELTEN-REC Office. Ethics approval is required BEFORE approval can be obtained from these authorities.

The NWU-EMELTEN-REC complies with the South African National Health Act 61 (2003), the Regulations on Research with Human Participants (2014), the Ethics in Health Research: Principles, Structures and Processes (2015), the Belmont Report and the Declaration of Helsinki (2013).

We wish you the best as you conduct your research. If you have any questions or need further assistance, please contact the NWU-EMELTEN-REC Office at Ethics-EMELTEN@nwu.ac.za.

Yours sincerely



Chairperson NWU-EMELTEN-REC

Original Details: (2213800) C:\My Drive\2019 Ethics\Research and integrated education\2019 Ethics\NWU-22140-1X-52_Final\22140-1X-52_1_Signed Approval

Date: 9 April 2019

File Path: 2019-04-09

ANNEXURE D: GATEKEEPER APPROVAL LETTER



Private Reg XE001, Potchefstroom
South Africa 2520

Tel: +2718 200 1111/2222

Web: <http://www.nwu.ac.za>

Research Data Gatekeeper Committee

NWU RDGC PERMISSION GRANTED / DENIED LETTER

Based on the documentation provided by the researcher specified below, on 04/02/2022 the North-West University (NWU) Research Data Gatekeeper Committee (NWU-RDGC) hereby grants permission for the specific project (as indicated below) to be conducted at the NWU.

<u>Project title:</u> Pre-service english first additional language teachers' digital competencies in lesson planning and presentation <u>Project leader:</u> Prof K. Kaiser <u>Researcher/Project Team:</u> S.F.A. Venter <u>Ethics reference no.:</u> NWU-E1058-21-02 <u>NWU RDGC reference no.:</u> NWU GRK 22 010 <u>Specific Conditions:</u> <u>Approval date:</u> 04/02/2022 <u>Expiry date:</u> 03/02/2023

General Conditions of Approval:

- The NWU-RDGC will not take the responsibility to recruit research participants or to gather data on behalf of the researcher. This committee can therefore not guarantee the participation of our relevant stakeholders.
- Any changes to the research protocol within the permission period (for a maximum of 1 year) must be communicated to the NWU-RDGC. Failure to do so will lead to withdrawal of the permission.
- The NWU-RDGC should be provided with a report or document in which the results of said project are disseminated.
- Due to the COVID-19 pandemic the Committee would like to advise the researcher to practise the necessary caution and adhere to the National Covid-19 Guidelines when conducting research with participants.

Please note that under no circumstances will any personal information of possible research subjects be provided to the researcher by the NWU RDGC. The NWU complies with the Promotion of Access to Information Act 2 of 2000 (PAIA) as well as the Protection of Personal Information Act 1 of 2013 (POPI). For an application to access such information please contact Ms Annemare De Kock (018 285 2771) for the relevant enquiry form or more information on how the NWU complies with PAIA and POPI.

The NWU RDGC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the NWU RDGC for any further enquiries or requests for assistance.

Yours sincerely



Prof Jeffrey Mphahlele
Chairperson NWU Research Data Gatekeeper Committee

Original includes: RDGC 1000 - Culture and Research Data Gatekeeper Committee
10 November 2018

Current includes: RDGC 1000 - Culture and Research Data Gatekeeper Committee
10 November 2018

File extension: .pdf

ANNEXURE E: ETHICAL TRAINING CERTIFICATE



Private Bag X0261, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Web: <http://www.nwu.ac.za>

Research Ethics Committee of the Faculty of
Education (EduREC)

Faculty of Education

IE: 018 299 2010
Email: jako.oliver@nwu.ac.za

16 August 2021

PROOF OF ATTENDANCE AND ASSESSMENT

Dear Susanna Fredrika Aletta Venter

This letter certifies that the abovementioned individual attended a 1-day online workshop on 14 August 2021 and completed online assessment on:

Research Ethics for Education

The workshop was presented by Prof. Jako Olivier, Chairperson of the Research Ethics Committee of the Faculty of Education (EduREC).

This letter of attendance, as proof of ethics training and assessment, is valid for 3 years and expires on 14 August 2024.

Yours sincerely

Prof. JAK Olivier

Chairperson: Research Ethics Committee of the Faculty of Education (EduREC)

ANNEXURE F: LANGUAGE EDITING CERTIFICATE



■ Language Matters Pty Ltd
■ info@languagematters.co.za
■ 082 920 2991
■ www.languagematters.co.za

Language Editor's Declaration

Language editing – Translation – Transcription – Simultaneous interpreting

[Company E-mail]

156 O R Tambo Street

Miederpark

Potchefstroom

2531

This document certifies that the manuscript/title listed below has been edited, within reasonable, ethical and professional limits, for syntax, grammar, spelling, punctuation and specific stylistic requirements of the English language by one or more qualified language practitioner(s) at Language Matters. The editor's revisions and comments serve as recommendations; the overall quality of the final manuscript's contents remains the responsibility of the client/author. The language editor does not accept responsibility for any changes made to the manuscript after the issuing of this declaration.

Manuscript title: Enhancing pre-service English first additional language teachers' digital competencies in lesson planning and presentation.

Author(s): SFA Venter

Date Issued: 30 November 2022

Issued by: BGS Language Matters and Media Services

ANNEXURE G: INFORMATION OF GROUP MEETINGS

Summary of the nine meetings:

Meeting 1

During meeting 1, the research solely focused on starting to meet the participants who were willing to take part in the study and start building a relationship with them. The researcher used different methods to enhance relationship building, and during this session the participants were asked to create a tree diagram to introduce themselves. They were guided by asking them to draw the leaves, branches, trunk, roots and environment to express how they see themselves. After the ice-breaker activity, the researcher proceeded to explain what the study is about, what cycles are involved, and what questions the project aims to answer. The session concluded after setting the date for the second meeting.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1J228Jfo7vdmBepJwqoBdB4xYpwmjB2GX/view?usp=sharing>

Meeting 2

During meeting 2, everyone was welcomed back, and the researcher explained the process of a PALAR study and all the aspects that are involved in this research project. After that, Mentimeter was used to ask the participants which of the aspects provided (logic, emotions, manager or optimist) explains their personality the best. After everyone answered the question on Mentimeter, we played a guessing game where the researcher asked each participant individually what they think the other participants chose. This resulted in a fun activity where everyone got to know each other better. After the ice-breaker activity, the researcher explained the figure 8 process as well as the cycles in this research study. I also explained the relationship between the researcher and the pre-service teachers who are all collaborative participants, and we addressed the roles they think they have in the research project. After this, we continued answering questions on Mentimeter. At the end of the meeting, I asked everyone to search for an image that explains their idea of a perfect classroom the best. The meeting ended after we determined the date of the next meeting.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

https://drive.google.com/file/d/1JWsPul5OYdCJn_qR88zRIEg0I_oWTTQS/view?usp=sharing

Meeting 3

During meeting 3 I welcomed everyone back and introduced the ice-breaker activity, where the participants had to choose a superpower and say why they chose it. The ice-breaker activity strengthened the relationships of the participants, and everyone was eager to share their choice of superpower. After that, I explained to everyone what a fishbone analysis is, after which we looked at the research questions again, and continued to look at possible causes why pre-service teachers might not use technology during their lesson planning and presentation. After discussing that, we looked at the effect it has as well. After setting the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1MFzd-cM6wB0XdJLlph98lEs2AGfYcrjO/view?usp=sharing>

Meeting 4

Before meeting 4, I sent the participants an ice-breaker activity with a backpack image and asked them to write down their positive traits and skills they received to do things in their life. After we looked at everyone's backpack and discussed their skills, we used Mentimeter again to answer questions regarding the types of programs they use during their lesson planning. After we discussed everyone's answers, we completed a chart on Mentimeter that asked how long it takes them to complete a lesson plan. We then commenced to focus more on lesson planning and created a graphic organiser in the form of a mind-map to determine what works well during their lesson planning phase, what their feelings and perspectives are during lesson planning, what activities they prefer to use, and what aspects they are struggling with during lesson planning. After asking everyone to reflect on Padlet, and setting the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1Lc2OaGNgwn88nnK5qwTcd3msMaZ0vC1V/view?usp=sharing>

Meeting 5:

During this meeting, many of the participants were sick and others struggled with semester work and external factors like load shedding. We started the meeting by doing a spin-the-wheel activity where I allocated certain numbers to every participant and spun an online wheel. When the wheel stopped on the participant's number, I asked them a question to get to know them better. After the ice-breaker activity, we continued to focus more on the context of the participants and the learners they work with, and proceeded to find themselves by completing an asset mapping document. We looked at the resources we have available as individuals, the organisations and associations that are available, as well as the institutions, services and the economy in the South African context. After discussing these resources and determining the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/drive/folders/1LdbgrIRLKunMXHbZznlgW2aPkCTXZMUW?usp=sharing>

Meeting 6

During meeting 6, the participants got together in the midst of Stage 4 load shedding, and I asked them to choose a colour of the rainbow that represented their current mood and situation and say why. We then continued to recap on the different cycles of the research study and what we addressed in the previous five meetings. We then started thinking of ideas to create an intervention plan to give pre-service teachers guidelines on how to use technology effectively in their lesson planning and presentation in an EFAL classroom. After discussing possible intervention plans and determining the next meeting date, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

https://drive.google.com/file/d/1MN2k_mB5BvDhW3FYqcn5e8h1D3W2iGbw/view?usp=sharing

Meeting 7

During meeting 7, the participants got together on MS Teams, and as an ice-breaker activity I asked everyone to share one thing that is on their bucket list that they still want to do one day. After discussing everyone's response, we continued to work on an intervention plan to give pre-service teachers guidelines on how to use technology effectively in their lesson planning and presentation in an EFAL classroom. After discussing the intervention plan and setting a date for the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link: https://drive.google.com/file/d/1NZasjqGg_ZilcNvupWOrhCEcjc_rEezg/view?usp=sharing

Meeting 8

During meeting 8, we used Mentimeter during the ice-breaker activity. For this activity everyone had to say which goal they have reached this year that they are proud of. After discussing that, we continued to answer questions on Mentimeter regarding their use of technology during the WIL, what their perceptions are now after time passed, using technology throughout the year, and whether they used technology during their teaching moment at their WIL practical. We then continued to write down responses on Mentimeter on what guideline they would give other pre-service teachers when using technology in their EFAL lesson planning. After determining the date of the next meeting, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link: https://drive.google.com/file/d/1O5jDJMnbfEoS1py4w1_svEGydaulqi2g/view?usp=sharing

Meeting 9

During this meeting, I asked everyone to search for an image on Google or take a photo resembling their experience of taking part in this research project. I told everyone to search for that during the meeting and that we will get back to the icebreaker at the end of the meeting. We then continued to look at the fishbone analysis and the intervention plan again, and added information where necessary. I reminded everyone about the cyclical process in this study, and after adding information to the fishbone analysis and the intervention plan, we looked at each person's ice-breaker image. After thanking everyone for taking part in this research project and asking them to complete the Padlet reflection for meetings 4 to 9, the meeting ended.

The meeting recording, verbatim transcription and all the extra information can be found in this link:

<https://drive.google.com/file/d/1P6S-OThbM6fWUS-ccSi79LUmRqP8c8Ps/view?usp=sharing>

A. MEETING 1

1. i) Agenda

SIMT Project

Focus group meeting 1: 30 March 2022 (18:00 – 19:00)

MS Teams

Agenda:

1. Welcome.
2. Attendance
3. Study overview (cycle 1: why and cycle 2: how)
4. PALAR overview
5. Introduction: each person introduces themselves and state what their name and surname is, where they are from, what year group they are in and what do they hope to gain from participating in this study.
6. Ice-breaker activity – each person presents their tree diagram.
7. Explain data gathering techniques:
 - 7.1 Focus group meetings
 - 7.2 Photovoice – 3 guidelines to remember with photovoice:
 - 7.2.1 Gain consent

7.2.2 Respect others

7.2.3 Have fun!

7.3 Reflective journaling through Padlet

8. Next meeting aims: start cycle 1 and identify the problem at hand.

9. Do Padlet reflection

10. Determine next meeting date and times:

2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 1:

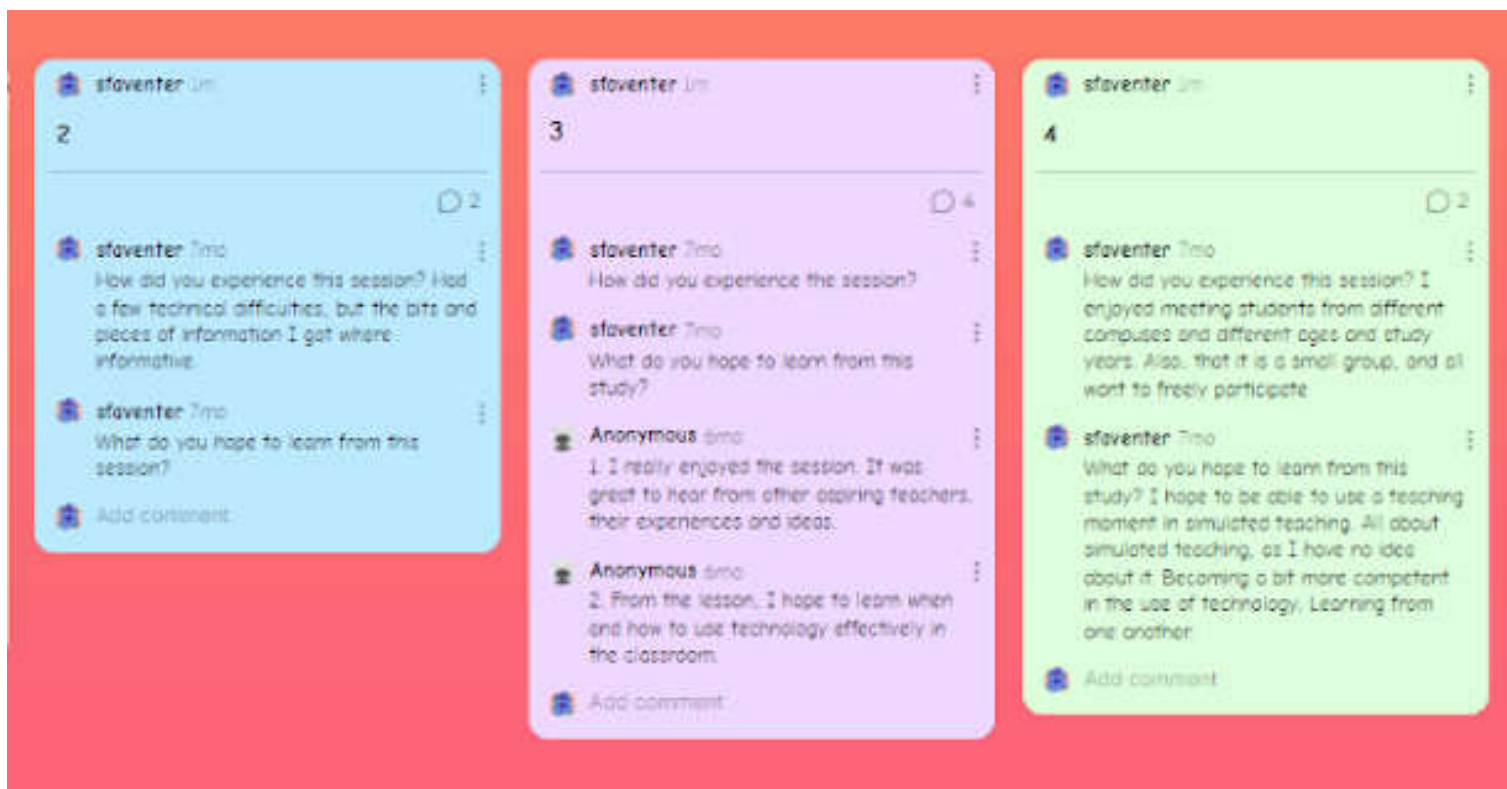
<https://drive.google.com/drive/folders/1IXYl6phxRJe1aO5kOgcK0wNbEskNhCQV?usp=sharing>

3. iii) Link to video recording

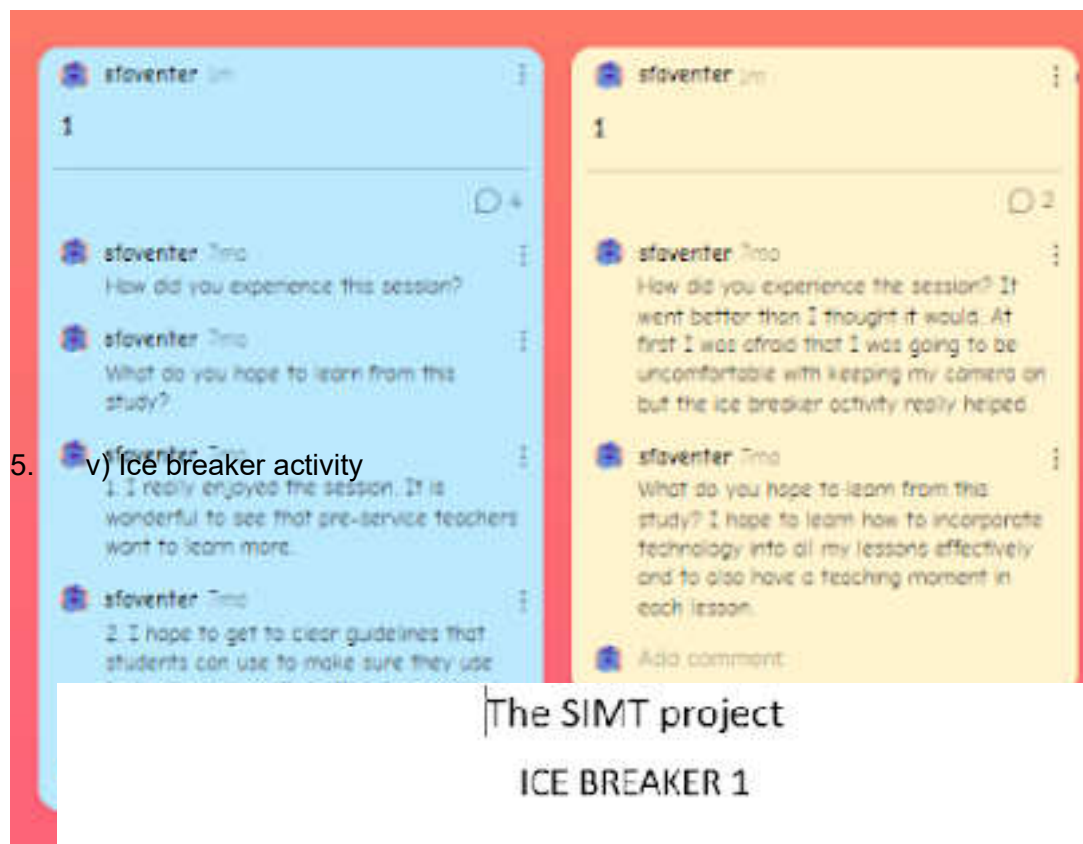
Link to meeting 1:

<https://drive.google.com/drive/folders/1IXYl6phxRJe1aO5kOgcK0wNbEskNhCQV?usp=sharing>

4. iv) Padlet reflection



5. v) Ice breaker activity



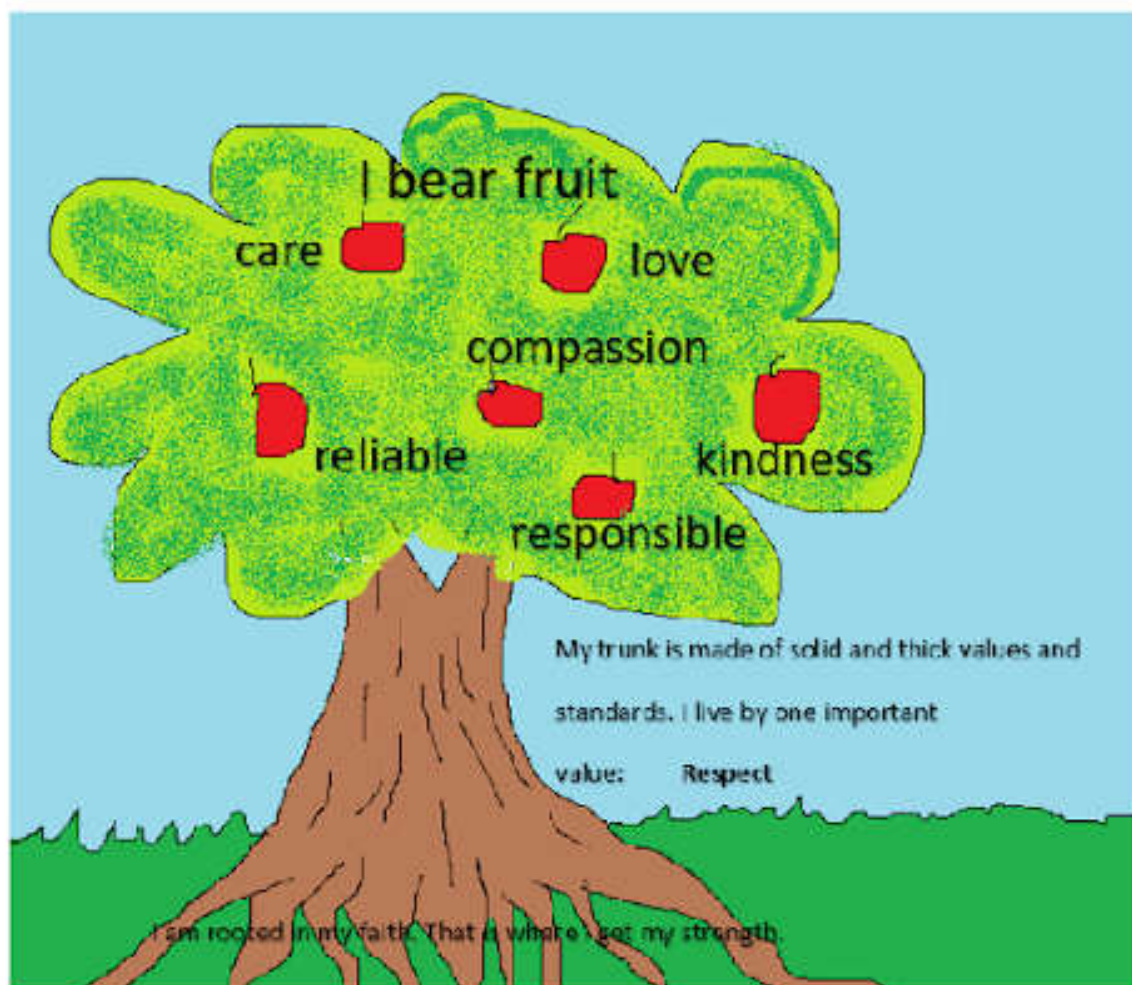
Draw yourself as a tree and describe yourself with specific reference to the colours of your leaves and stem, your size, the environment in which you are planted, the threats you experience and the conditions that contribute to your wellbeing.

PLEASE CONSIDER THE FOLLOWING BEFORE YOU START WITH THE DRAWING

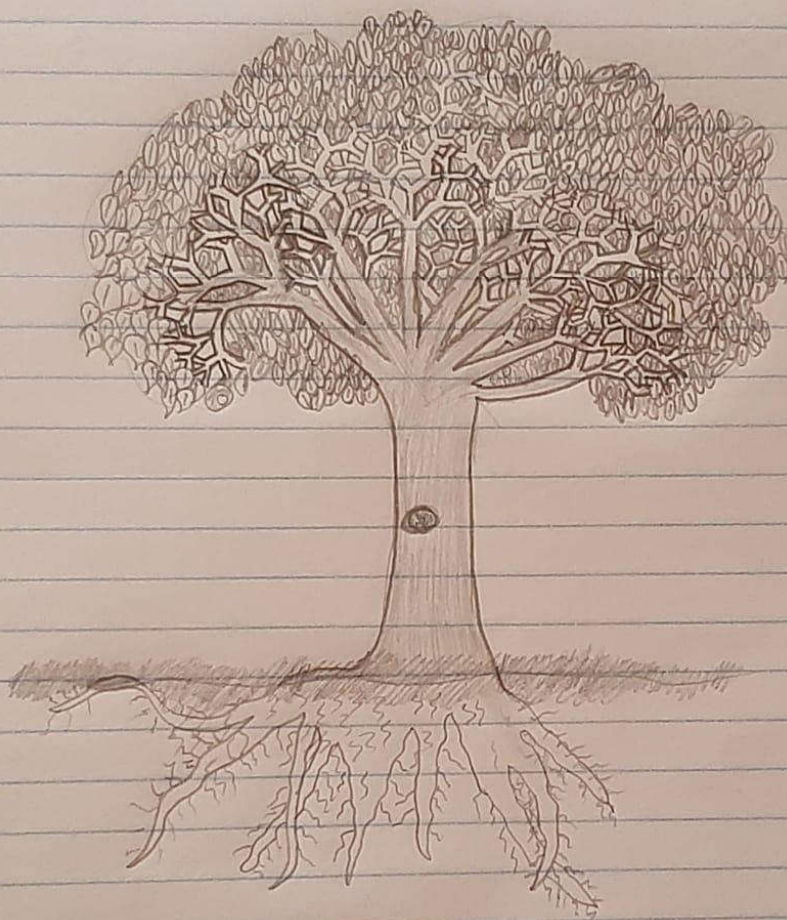
- ❖ The exercise intends to provide you with an opportunity to think about the way you perceive yourself and how you position yourself in your context.
- ❖ There is not a right or wrong way to do it and it is not an assessment of your artistic skills
- ❖ On completion of the drawing and the description you can share your drawing with someone you trust – it may be a fellow participant, a family member or a colleague.
- ❖ Please see the example below:



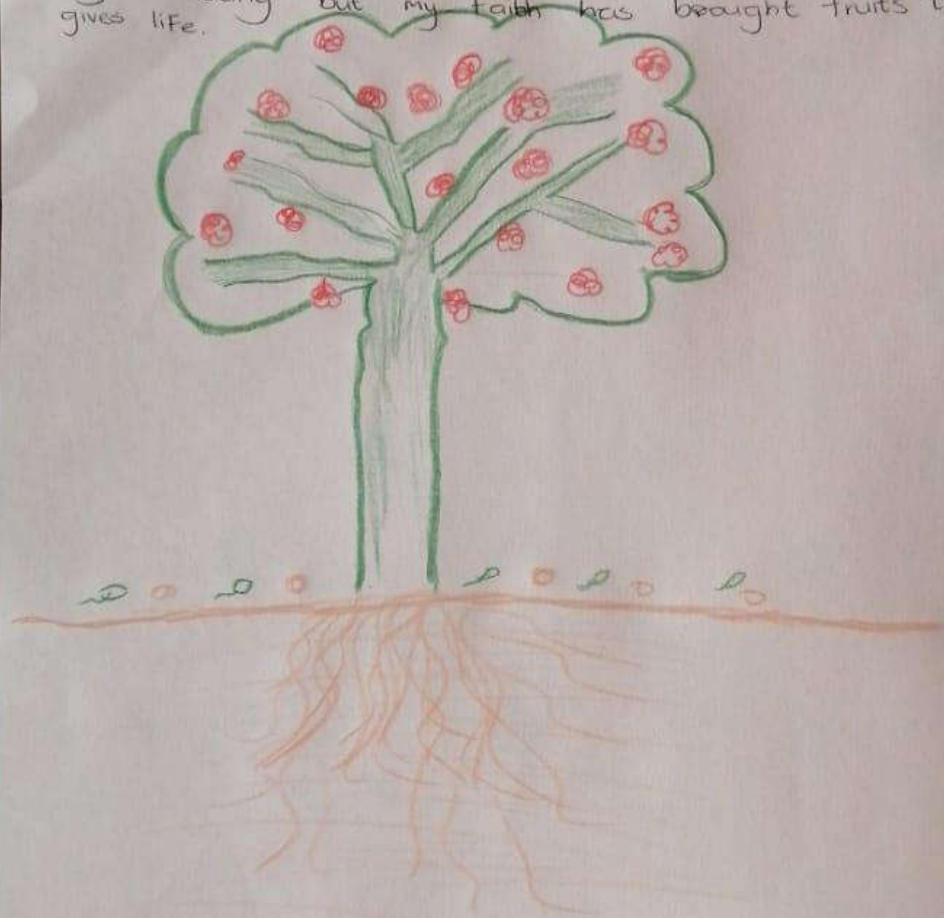
I am a tree grounded in the belief that I am strong because I am rooted in the love that flows from my connectedness to my roots. My stem firmly supports me in dealing with the winds of change that have blown throughout my life. My branches have grown in different directions reflexive of the journey that bear leaves and fruit for which I am grateful. I am not too tall because I



I see myself as a big tree in an open field. Rooted firmly in the soil by ~~to~~ my believe system. I have a thick, sturdy trunk that can and had withstand the worst and best of times. I have a ~~I~~ vast network of branches ~~Supporting~~ Supporting my goals in life. My branches hold up my leaves of trust, loyalty and respect.



I am a tree grounded in love, my roots deep within love of family. I am held up strong by the stem of faith and belief in prayer. It has anchored me through all the storms I had to withstand. My branches have gone through all the seasons of life. They were green then became yellow then brown because of death but have grown again because of new life and the roots kept absorbing love through all seasons. Death and loneliness have threatened my wellbeing but my faith has brought fruits that gives life.





Name: Francisca Sarro
 Student number: 29 866 103

The colours of my leaves are the different seasonal colours. This represents the cycle of growth ending in winter where all are shed to start afresh in spring.

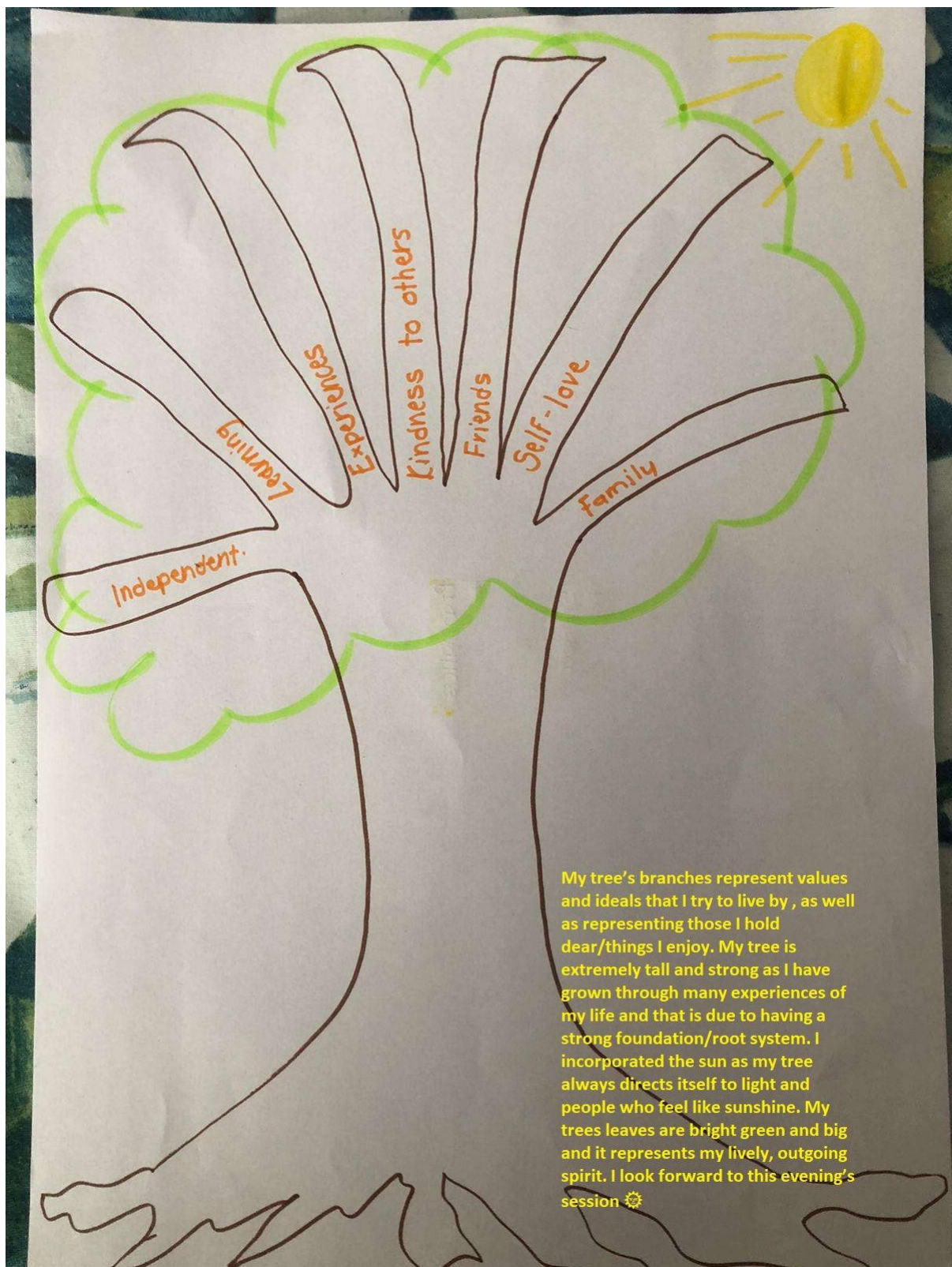
The heart represent what leads to final decisions.

My roots are strong because surrounded by a strong support system: Nature, family & friends.

I am about 5m tall, & still growing.

I am planted in fertile soil where everything I need to grow, my food, feed animals, and my shadow protect bird eggs protected.

Nature (sunlight, water & a life) & exercise nature the (ocean)



My tree's branches represent values and ideals that I try to live by, as well as representing those I hold dear/things I enjoy. My tree is extremely tall and strong as I have grown through many experiences of my life and that is due to having a strong foundation/root system. I incorporated the sun as my tree always directs itself to light and people who feel like sunshine. My tree's leaves are bright green and big and it represents my lively, outgoing spirit. I look forward to this evening's session ☀

B. MEETING 2

1. i) Agenda

SIMT Project

Focus group meeting 1: 5 April 2022 (18:00 – 19:00)

MS Teams

Agenda:

1. Welcome.
2. Attendance
3. Study overview (cycle 1: why and cycle 2: how)
4. Research study cycle
5. Identify the problem.
6. Ice-breaker activity – each person presents their tree diagram.
7. Do Padlet reflection
8. Determine next meeting date and times
9. End the meeting.

2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 2: <https://drive.google.com/drive/folders/1JI4kXeFmgz-OEbETsZ9wPd7NFV7Sc31u?usp=sharing>

3. iii) Link to video recording

Link to the video recording of meeting 2: <https://drive.google.com/drive/folders/1JI4kXeFmgz-OEbETsZ9wPd7NFV7Sc31u?usp=sharing>

4. iv) Padlet reflection

staveren + 4 • 6mo

SIM-T meeting 2

Reflection

1

+

1. How did you experience meeting 2?

2. What would you say is your perspective on using technology in your lessons?

Your feedback:

1. This was such a productive session. I enjoyed the session so much! I really like doing and experiencing collaborative work using technology and brainstorming with the team.

2. I realised that even I had a different idea of using technology. After our meeting I was thinking about critical thinking and how can I elicit critical thinking using technology. This is something I hope to address in future meetings.

2

+

1. I enjoyed everyone's opinions and input. Using Microsoft teams, the quiz alongside Google search made the session very interesting.

2. For learners to benefit from the use of technology it should be used in an interactive, cooperative manner.

1. How did you experience meeting 2?

2. What would you say is your perspective on using technology in your lessons?

Your feedback:

3

+

1. How did you experience meeting 2?

2. What would you say is your perspective on using technology in your lessons?

Your feedback:

4	5	6
+	+	+
I found the meeting to be interesting, hearing the opinions of different people gave me lot to think about. Being in different places deepens the discussion as we all bring different opinions based on our experience. Technology can be a useful tool for teaching and learning, however, it is not always reliable or accessible. Many schools cannot afford the gadgets needed and also many teachers don't have the knowledge on how to use technology to prepare, present or even assess a lesson.	1. I found the second meeting meaningful. I enjoyed giving feedback and hearing others' opinions. I just didn't like having to use my phone to share pictures of my ideal classroom as I wanted to remain focused and I felt the time given to search for the picture was maybe a bit too long. 2. I am definitely for using technology in the classroom where ever possible. It is so convenient and easy to use (with the proper training) and I think it can give your lessons extra flair. It obviously isn't appropriate in ALL contexts, but I think it should be used where the context allows for it.	1. The meeting was interesting and I learned a lot in the hour that we talked. 2. I would say that technology is a help tool to use in the preparation an presentation of a lesson.
1. How did you experience meeting 2? 2. What would you say is your perspective on using technology in your lessons?	1. How did you experience meeting 2? 2. What would you say is your perspective on using technology in your lessons?	1. How did you experience meeting 2? 2. What would you say is your perspective on using technology in your lessons?
Your feedback:	Your feedback:	Your feedback:

5. v) Ice breaker activity

Mentimeter

Discussion

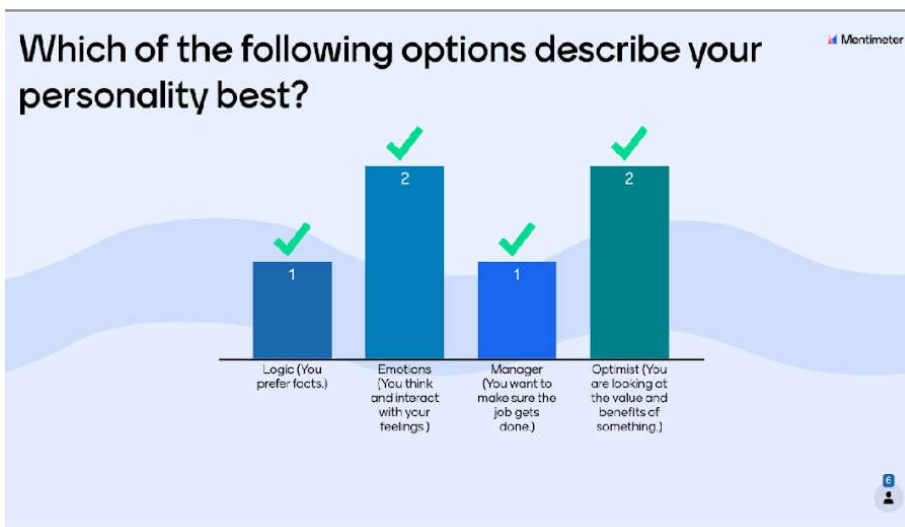
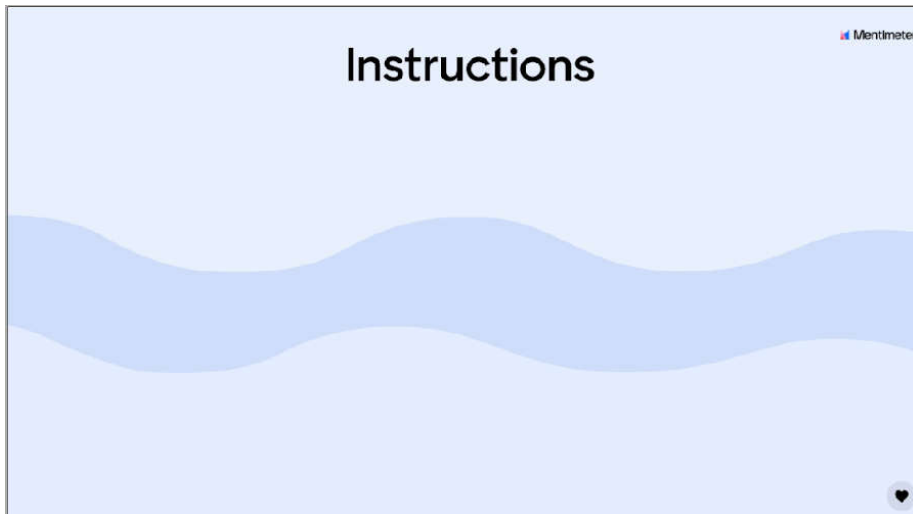
Please search for a photo or image on Google that best illustrates what you think a classroom setting looks like. WhatsApp it to me and I will display your image while we are discussing it.

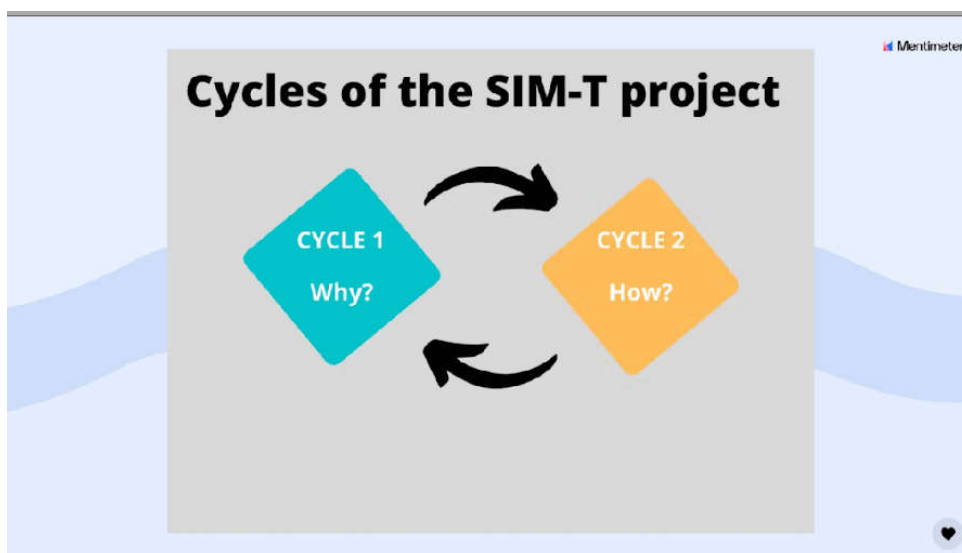
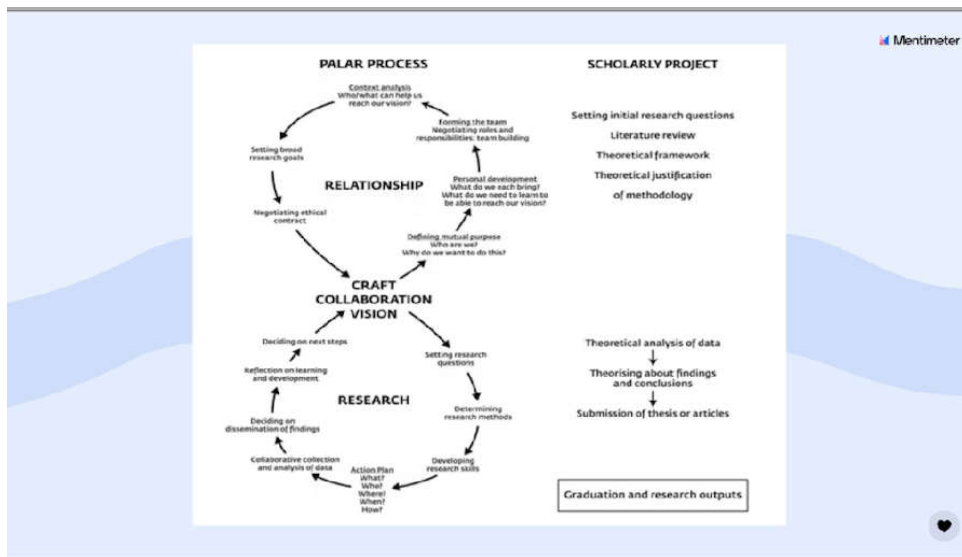






6. vi) Group meeting resources





Mentimeter

The participants of the SIM-T project

In this P4L-IR project, we are working together to find an answer to the research questions and help future pre-service teachers to incorporate technology correctly in their lesson plans.

Pre-service teachers

COLLABORATIVE PARTICIPANTS

Researcher

Heart icon

Mentimeter

Write down 3 words or phrases that describe your idea of technology and your use thereof.

discoveries

improvements

useful tool

time consuming

great learning tool

frustrating

convenient

exciting

challenging

advanced

different

at times foreign

easily accessible

exciting for learners

next world

5

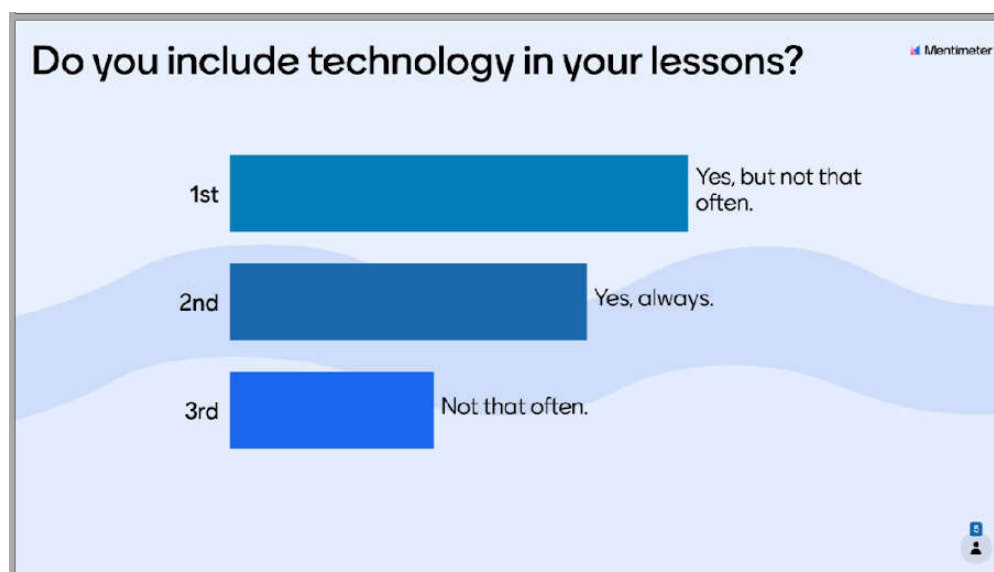
Person icon

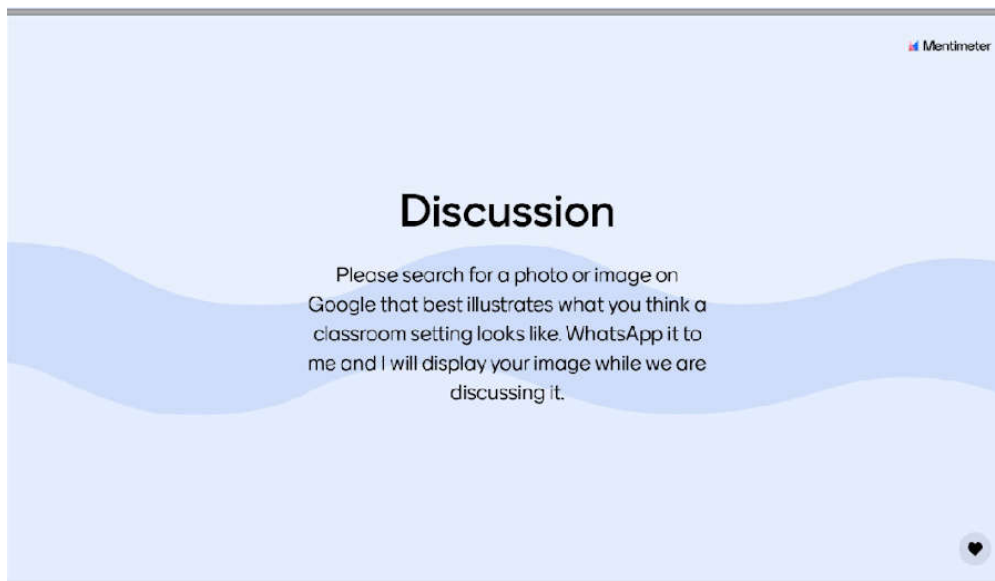
Mentimeter

Pedagogical Content Knowledge is
"the ways of representing and formulating
the subject that make it comprehensible to
others"

— Lee Shulman (1986)

♥





C. MEETING 3

1. i) Agenda

SIMT Project

Focus group meeting 1: 7 April 2022 (18:00 – 19:00)

MS Teams

Agenda:

1. Welcome.
2. Attendance
3. Study overview (cycle 1: why and cycle 2: how)
4. Do the fish bone analysis together.
5. Do Padlet reflection
6. Determine next meeting date and times
7. End the meeting.

2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 3:

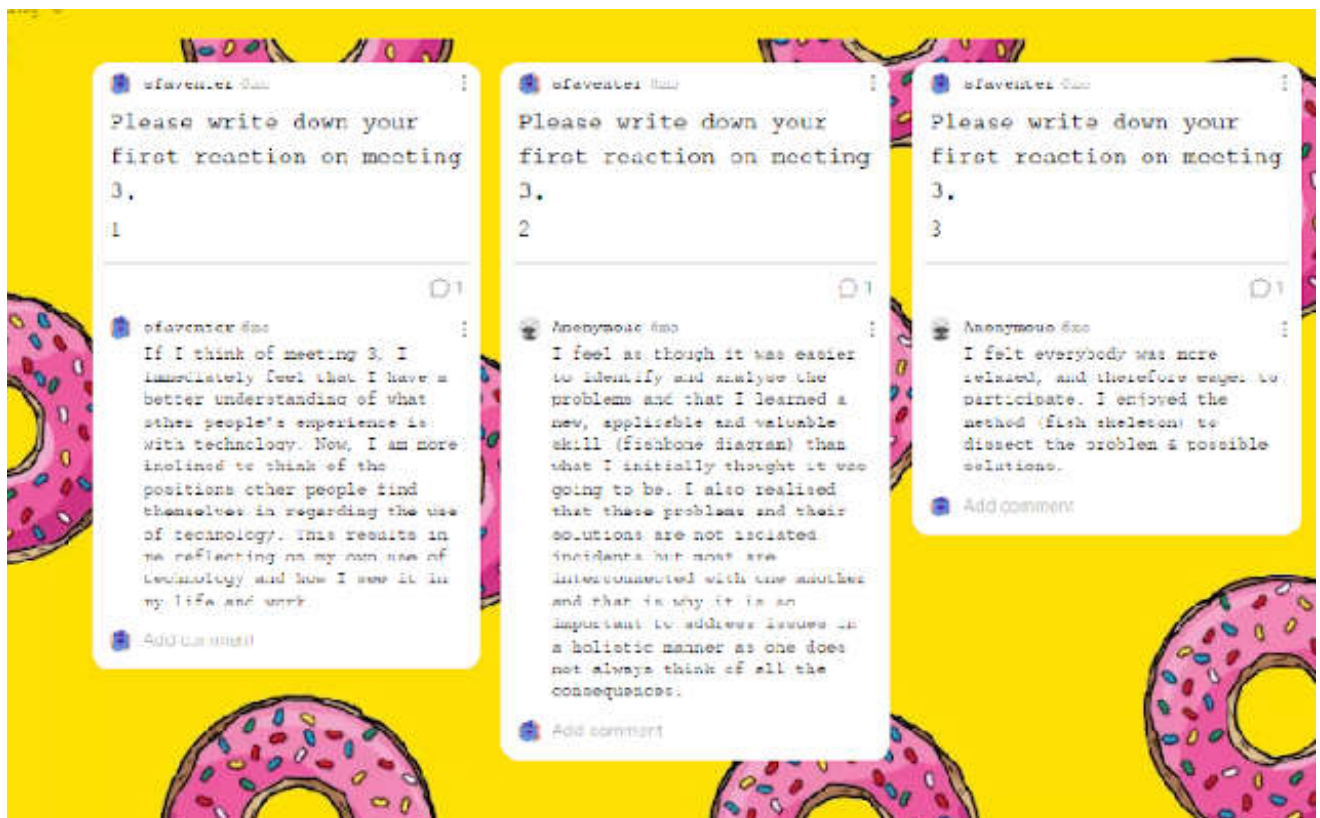
https://drive.google.com/drive/folders/1KQdV0TTf2AvEHJB6gPO_nTGPffCOUsSS?usp=sharing

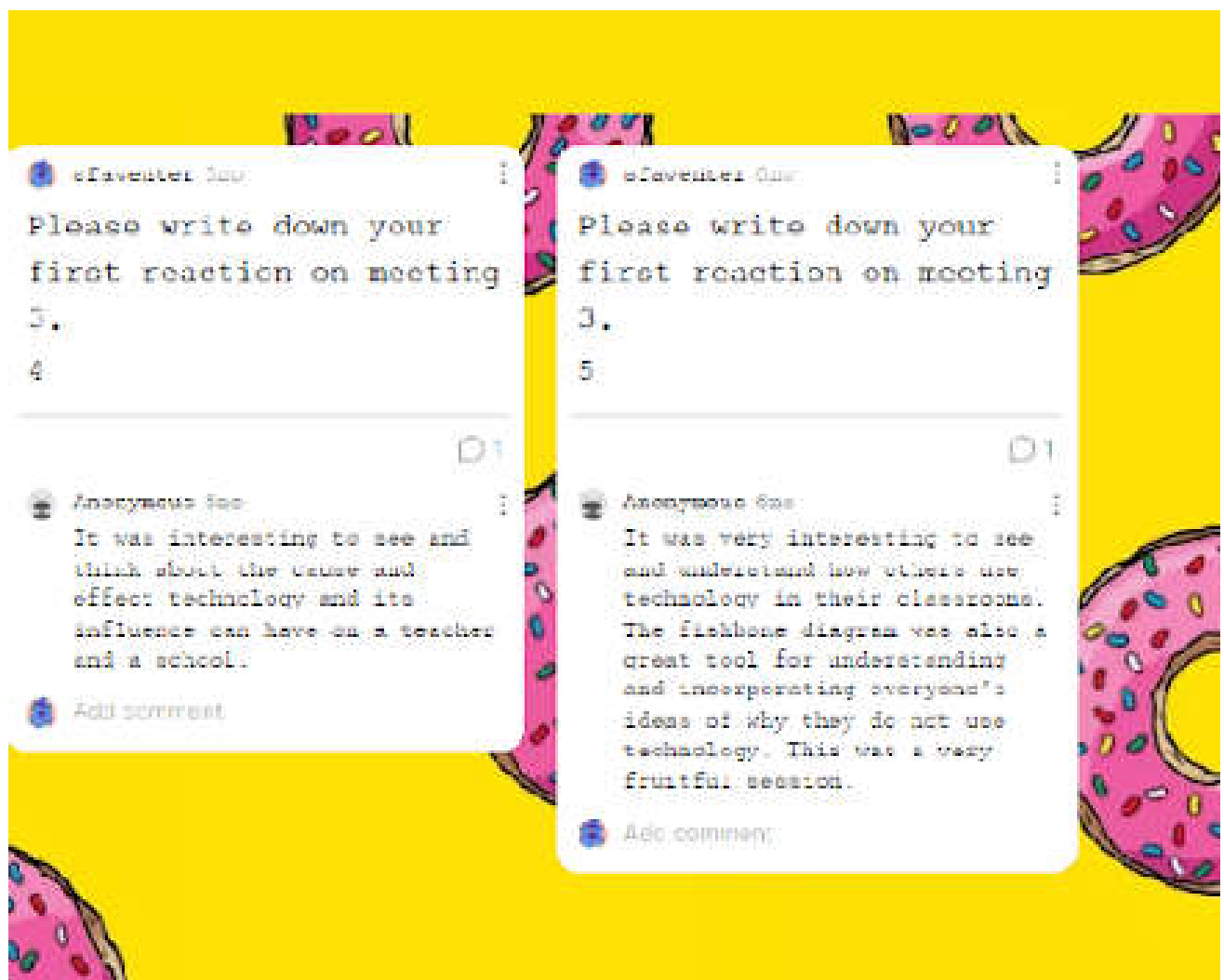
3. iii) Link to video recording

Link to the video recording of meeting 3:

https://drive.google.com/drive/folders/1KQdV0TTf2AvEHJB6gPO_nTGPffCOUsSS?usp=sharing

4. iv) Padlet reflection





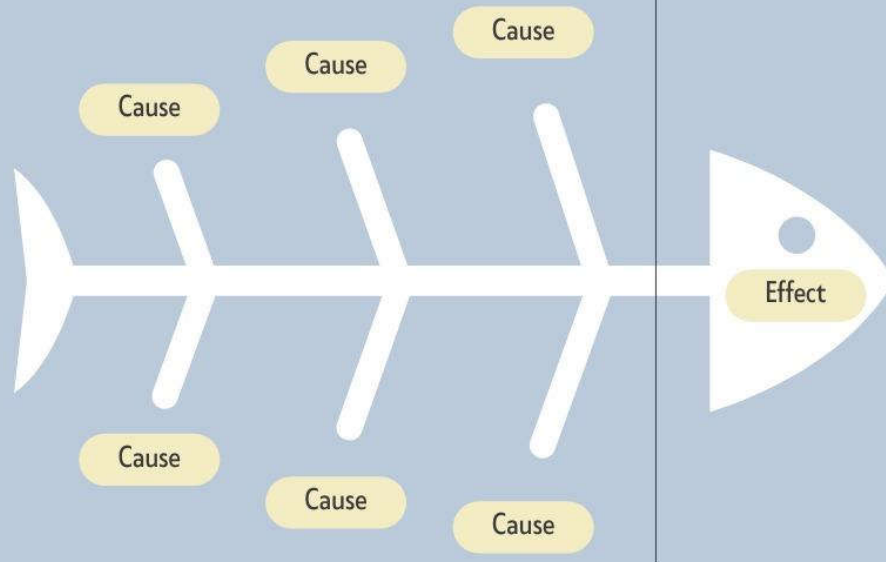
5. v) Group meeting resources

Before the meeting:

Fishbone Analysis

CAUSES

EFFECT

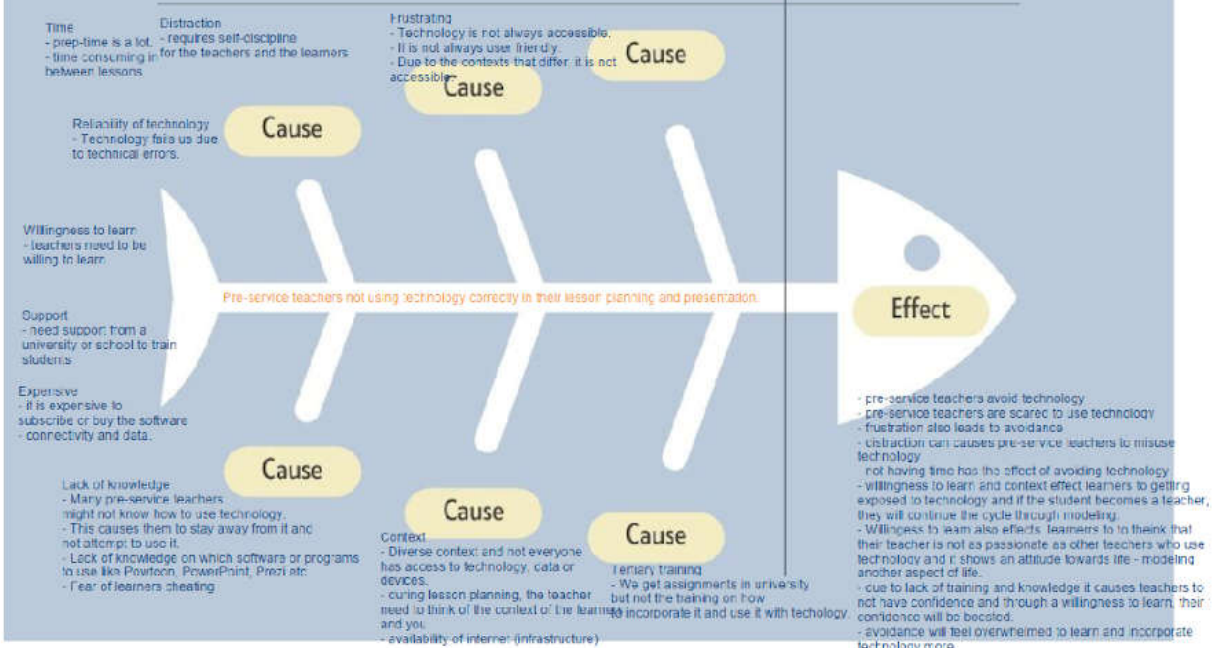


After the meeting:

Fishbone Analysis

CAUSES

EFFECT



D. MEETING 4

1. i) Agenda

SIMT Project

Focus group meeting 1: 5 April 2022 (18:00 – 19:00)

MS Teams

Agenda:

1. Welcome.
2. Attendance
3. Ice-breaker activity
4. Do a graphic organizer together on the use of technology.
5. Do Padlet reflection
6. Determine next meeting date and times
7. End the meeting.

2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 4:

https://drive.google.com/drive/folders/1KyVanCHf_pc_QAawiiYRPVfVqRYm5WsE?usp=sharing

3. iii) Link to video recording

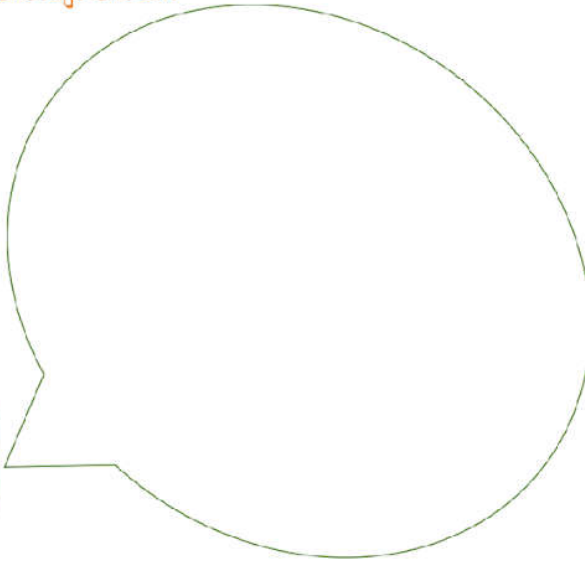
Link to the video recording of meeting 4:

https://drive.google.com/drive/folders/1KyVanCHf_pc_QAawiiYRPVfVqRYm5WsE?usp=sharing

4. v) Ice breaker activity

What is in your backpack?

We all received a backpack
in life with certain skills that
help us and make us who we are.
What special skills did you get in
Your backpack that make you special?
E.g. planning, managing, etc.
Write them in the bubble.



Ice breaker activity response from participants:

What is in your backpack?

We all received a backpack
in life with certain skills that
help us and make us who we are.
What special skills did you get in
Your backpack that make you special?
E.g. planning, managing, etc.
Write them in the bubble.



I am motivated. When I set my
mind to something I finish it as
best I can.

I have a sense of humour, and like
to have fun.

Flexible and adaptable.

Helpful

Good people skills.

What is in your backpack?

We all received a backpack
in life with certain skills that
help us and make us who we are.
What special skills did you get in
Your backpack that make you special?
E.g. planning, managing, etc.
Write them in the bubble.



Time management

Detail orientated

Adaptability

Flexible

Creative

**QUICK
LEARNER**

What is in your backpack?

We all received a backpack
in life with certain skills that
help us and make us who we are.
What special skills did you get in
Your backpack that make you special?
E.g. planning, managing, etc.
Write them in the bubble.



Self discipline
Planning
Cooperating
People skills
Creativity
Organising

What is in your backpack?

We all received a backpack
in life with certain skills that
help us and make us who we are.
What special skills did you get in
Your backpack that make you special?
E.g. planning, managing, etc.
Write them in the bubble.



Organizing
Multi-tasking
Delegating

What is in your backpack?

We all received a backpack
in life with certain skills that
help us and make us who we are.
What special skills did you get in
Your backpack that make you special?
E.g. planning, managing, etc.
Write them in the bubble.



- Organization
- Growth mindset.
- Critical thinking.
- Adaptability.
- Flexibility.

5. vi) Group meeting resources

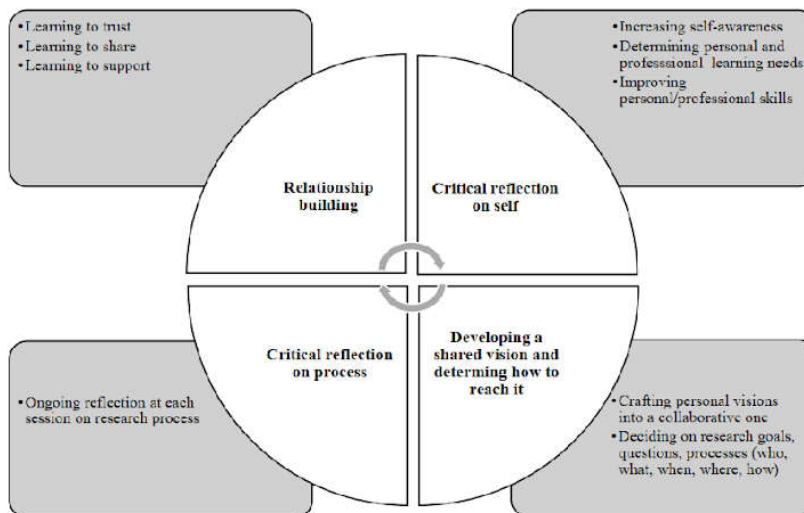


Figure 4.1: An overview of the action learning set within PALAR (Wood, 2020, p.67)



E. MEETING 5

1. i) Agenda

SIMT Project

Focus group meeting 5: 27 April 2022 (18:00 – 19:00)

MS Teams

Agenda:

11. Welcome.
12. Attendance and catching up
13. Ice-breaker: spin the wheel
14. Study overview (cycle 1: why and cycle 2: how)
15. Recap on what we have done so far
 - 15.1 Meeting 1 was the introduction and ice-breaker
 - 15.2 Meeting 2 Cycles and roles

- 15.3 Meeting 3 Fish bone analysis
- 15.4 Meeting 4 Graphic organiser
- 16. Asset mapping
- 17. Do Padlet reflection:
- 18. For the next meeting: Make a drawing that represents how you see yourself teaching in your context using technology? There is no right or wrong answer. Write a caption or explanation of the drawing.
- 19. Next meeting: 28 April at 18:00 – 19:00

Spin the wheel number allocation:

- 1. Erika
- 2. Fransisca
- 3. Lydia
- 4. Nicole
- 5. Jenique
- 6. Prudence
- 7. Dineo

Ice-breaker questions:

- 1) What was the one thing that made you happy today?
- 2) What is your favourite item you've bought this year?
- 3) What's the best piece of advice you've ever been given?
- 4) Are you an early bird or night owl?
- 5) Best book you've ever read?
- 6) If you could learn one new personal skill, what would it be?
- 7) What is your most used emoji?
- 8) You have to sing karaoke, what song do you pick?
- 9) What series are you watching at the moment?

- 2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 5:

<https://drive.google.com/drive/folders/1LdbgrIRLKunMXHbZznlgW2aPkCTXZMUW?usp=sharing>

3. iii) Link to video recording

Link to the video recording of meeting 5:

<https://drive.google.com/drive/folders/1LdbgrIRLKunMXHbZznlgW2aPkCTXZMUW?usp=sharing>

4. v) Ice breaker activity

Ice-breaker questions:

- 1) What was the one thing that made you happy today?
- 2) What is your favourite item you've bought this year?
- 3) What's the best piece of advice you've ever been given?
- 4) Are you an early bird or night owl?
- 5) Best book you've ever read?
- 6) If you could learn one new personal skill, what would it be?
- 7) What is your most used emoji?
- 8) You have to sing karaoke, what song do you pick?
- 9) What series are you watching at the moment?

5. vi) Group meeting resources

Example of asset mapping:



Work with your planning group to create a list of potential assets in your community. It's important to take stock of the strengths of your community, not just its needs. Community assets are important in three ways:

- As inputs and context for your public health intervention
- As factors related to successful implementation of your intervention
- As potential outputs, signaling the impact of your intervention

Use the list below to help guide your brainstorm of community strengths.

Individuals ■ Skills, talents, and experience of community members ■ Individual businesses ■ Home-based enterprises ■ Donations/financial sponsors	Public Institutions and Services ■ Public schools ■ Police and fire departments ■ Libraries ■ Parks and recreation
Organizations ■ Associations of businesses ■ Citizens' associations ■ Cultural organizations ■ Communications organizations ■ Faith-based organizations	Physical Resources ■ Vacant land ■ Commercial and industrial structures ■ Housing ■ Energy and waste resources ■ Billboards and community bulletin boards ■ Community meeting spaces
Private and Nonprofit Organizations ■ Institutions of higher education ■ Hospitals	Informal Organizations and "Intangibles" ■ Neighborhood associations and other

Asset mapping completed during the online group meeting:

Asset mapping

Key objectives of asset mapping;

- As inputs and context for your public health intervention
- As factors related to successful implementation of your intervention
- As potential outputs, signaling the impact of your intervention

Individuals:

- Knowledge on lesson planning, skills and experience
- As teachers we have great time management skills
- We have a passion for what we do.
- We have good communication and listening skills.
- We have a body of knowledge that we can ask for assistance or help.
- We have more patience.
- We have multitasking skills.
- Improvising skills

Organisations/associations:

- SACE
- The university
- Schools where we do out practicals
- The Department of Education
- School tour organization (schools use this organisation to plan tours)

Public institutions and services:

- Internet
- Library services

- Museums, plants, factories etc.

Physical resources:

- Computers
- CAPS document
- Text books
- Books
- Magazines
- Completed research studies

Economy:

- We have a wide variety of sosio-economic diversity
- Not everyone has access to the same resources
- Some are very rich, others do not have access to basic resources

F. MEETING 6

1. i) Agenda

SIMT Project

Focus group meeting 6: 13 July 2022 (18:00 – 19:00)

MS Teams

Agenda:

1. Welcome.
2. Attendance and catching up
3. Ice-breaker: choose a rainbow colour and say why you chose it.
4. Study overview (cycle 1: why and cycle 2: how)
5. Recap on what we have done so far
 - 5.1 Meeting 1 was the introduction and ice-breaker
 - 5.2 Meeting 2 Cycles and roles

- 5.3 Meeting 3 Fish bone analysis
- 5.4 Meeting 4 Graphic organiser
- 6. Introduction to an intervention
- 7. Do Padlet reflection:
- 8. Next meeting: 19 July at 18:00 – 19:00

2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 6:

<https://drive.google.com/drive/folders/1LvXa1JNJXPy2n8ka1Oo6uWKFsDcpuogg?usp=sharing>

3. iii) Link to video recording

Link to the video recording of meeting 6:

<https://drive.google.com/drive/folders/1LvXa1JNJXPy2n8ka1Oo6uWKFsDcpuogg?usp=sharing>

4. v) Ice breaker activity

Choose a rainbow colour that best represents your current mood and stance and explain why It does.

5. vi) Group meeting resources

Draft intervention plan done during the meeting:

Intervention:

Enhance pre-service teachers' use of technology in lesson planning and presentation

- Simulated teaching (guidelines) – for online teaching

Guidelines for pre-service teachers:

- Step 1: I need to realise that I am the teacher and I need to teach the content.
 - o Cannot just play a video.
 - o Stop video and incorporate media/technology with the content you are teaching. The teacher need to guide the learners and explain the content to the learners.
 - o Understand that technology is a resource and tool. It must help and assist you to achieve the lesson goals. So the teacher must know how to use the tools to teach otherwise the tools are useless.
 - o Understand the learners' background and context so that the technology can be incorporated effectively.
 - o Do not depend on technology. Use it as an aid and we must be able to continue without it once it is no longer available.
 - o Consider whether the use of technology in the lesson is useful
- Step 2: Whatever you are teaching needs to be relevant and must match the learning outcomes of the lesson.
- Step 3: Use technology to elicit interest in the learners and incorporate the real-life components of the content using technology while keeping the learners' context in mind (relevant)
- Step 4: Ask critical thinking questions to improve learners' problem solving skills. How? (get back to this)
 - o How? – makes the learners think as well as the teacher
- Step 5: teaching moment –
 - o Aspects a teaching moment must have:
 - Engagement (teacher and learners)
 - Interaction (teachers and learners)
 - Cater to all the different needs of the learners
 - Explicit teaching
 - The lesson should link with reality and relate to the content. Link to the real world.

G. MEETING 7

1. i) Agenda

SIMT Project

Focus group meeting 7: 21 July 2022 (18:00 – 19:00)

MS Teams

Agenda:

1. Welcome.
2. Attendance and catching up
3. Ice-breaker: Name one think on your bucket list.
4. Study overview (cycle 1: why and cycle 2: how)
5. Continue with intervention
6. Do Padlet group reflection:
7. For next meeting: Take a photo of your WIL classroom and implement the intervention strategies.
8. Next meeting: 28 July at 18:00 – 19:00

2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 7:

https://drive.google.com/drive/folders/1MDhsp5FwLxhjzK4iXFjR_YrFBorywod?usp=sharing

3. iii) Link to video recording

Link to the video recording of meeting 7:

https://drive.google.com/drive/folders/1MDhsp5FwLxhjzK4iXFjR_YrFBorywod?usp=sharing

4. v) Ice breaker activity

Name one thing on your bucket list that you would still like to do.

H. MEETING 8

1. i) SIMT Project

Focus group meeting 8: 15 September 2022 (19:00 – 20:00)

MS Teams

Agenda:

1. Welcome.
2. Attendance and catching up
3. Ice-breaker: Achievements
4. Study overview (cycle 1: why and cycle 2: how)
5. Reflection
6. Do Padlet group reflection:
7. For next meeting:
8. Next meeting: 21 September 2022

2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 8: <https://drive.google.com/drive/folders/1NDatvKo4-d1IGSeIAyflHflsVBpHWKWS?usp=sharing>

3. iii) Link to video recording

Link to the video recording of meeting 8: <https://drive.google.com/drive/folders/1NDatvKo4-d1IGSeIAyflHflsVBpHWKWS?usp=sharing>

4. v) Ice breaker activity

Name one achievement you have reached this year that you are proud of. It does not matter how small it may be.

5. vi) Mentimeter

What goal did you reach this year? It doesn't matter how small it is.

Mentimeter

on my final semester
completing the 1st semest
attitude and appreciate
i still have a positive
balance life
taking care of my health
proper mindset
to do a masters
raising beautiful childre
expanded my comfort zone
did a first aid course
spending time with family
more time with my boys
finding new friends
the small things and fami

Did you use technology during your WIL lesson planning?

Mentimeter

Yes, I used Google, YouaTube, academic resources like Google Scholar, I used my laptop and phone.

Only for preparation, not presentation. I used my laptop, phone, google, YouTube.

For planning and presentation.

Yes, I used my laptop to plan and create powerpoints and activities to use during the presentation of my lessons.

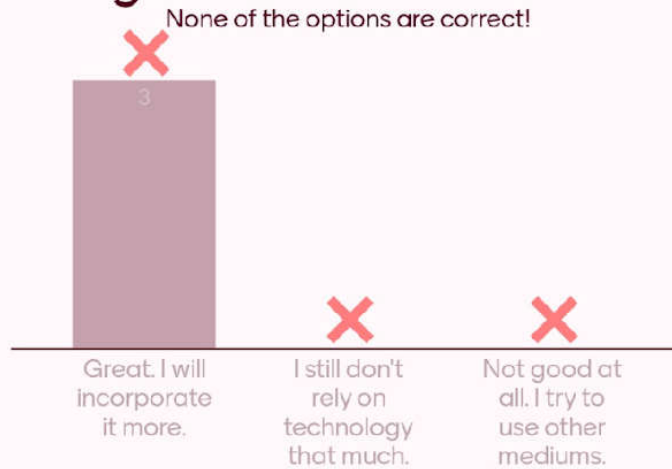
Yes I did. There were smartboards in the school and I usually did PowerPoint presentations to teach. Sometimes we would watch relevant YouTube videos on the smartboard.

I used my cellphone to research on the topic and find some images but I never used it in the class during the presentation. The reason was because the classroom at that school was not equipped with a whiteboard. They use the blackboard and chalk.

I used to also watch YouTube videos to learn how to be creative when teaching.

After planning lessons during WIL and teaching in class, how do you feel about using technology in your lesson planning?

Mentimeter



I. MEETING 9

1. i) SIMT Project

Focus group meeting 9: 29 September 2022 (19:00 – 20:00)

MS Teams

Agenda:

1. Welcome.
 2. Attendance and catching up
 3. Ice-breaker: Google a photo and send it on the WhatsApp group that explains your experience of being part in this project.
 4. Fishbone and guidelines touch-up
 5. Do Padlet group reflection: use the same link as last time
 6. Ending
2. ii) Verbatim transcription of online meeting.

Link to the transcription of meeting 9:

<https://drive.google.com/drive/folders/1O4DGEkvZ0n2yIlewpCy9c6JsiicRibJA?usp=sharing>

3. iii) Link to video recording

Link to the video recording of meeting 9:

<https://drive.google.com/drive/folders/1O4DGEkvZ0n2yIlewpCy9c6JsiicRibJA?usp=sharing>

4. v) Ice breaker activity

Search for a photo or take a photo that represents your experience of being part of this project the best and send it to me on WhatsApp. Also write a caption that describes why you chose that photo.

ANNEXURE H TURNITIN REPORT



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