The influence of improved acoustics on English First Additional Language teaching and learning in the Foundation Phase

by

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DECLARATION

I, M.O. Marumo (92874429) declare that:

> The influence of improved acoustics on English First Additional Language teaching and learning in the Foundation Phase

which I hereby submit for the PhD degree at the University of Pretoria is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. The thesis has not previously been submitted by me for a degree at this or any other tertiary institution.

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Mpho Otlametse Marumo

_____

Date

ETHICS CERTIFICATE

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RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	CLEARANCE NUMBER: **EC 15/03/01**
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This Ethics Clearance Certificate should be read in conjunction with the Integrated Declaration Form (D08) which specifies details regarding:

- Compliance with approved research protocol,
- No significant changes,
- Informed consent/assent,
- Adverse experience or undue risk,
- Registered title, and
- Data storage requirements.

DEDICATION

I dedicate this research to my father Tshipinare Marumo, who passed on when I was a baby, my brother Tawana Marumo, my son Koketso Maunatlala and to my mother Gomolemo Segwai, who has been the pillar of my strength as my teacher and my role model.

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ABSTRACT

The influence of improved acoustics on English First Additional Language teaching and learning in the Foundation Phase

English First Additional language is introduced to the non-speakers of the language in Grade 1. This is in line with the Curriculum Assessment Policy Statement, which requires English to be introduced to Grade 1 learners irrespective of their home language or their language background (Department of Basic Education, 2012). To the majority of learners in South Africa, English is a second or a third language. Learning a new language poses numerous challenges, such as inability to decipher the sound system of the language. Moreover, primary school classrooms are known for being action filled and accommodative of what is known as "productive noise", which makes it difficult for Foundation Phase teachers to be audible to all learners in the classrooms. Options that are commonly used to reduce noise are hanging curtains and fitting tennis balls on the legs of chairs. This study focused on the use of a dynamic sound field amplification system as one way to improve acoustics in the classroom.

The purpose of this study was to document the teachers' experiences when using dynamic sound field amplification system. Although this study was not an intervention, the concept evaluation was used to understand teachers' experiences and challenges as regards the background noise in their classrooms.

This study was conducted in three Grade 1 mainstream classrooms where English First Additional Language is used for teaching and learning in the North West Province**,** South Africa.

The classroom observations afforded me the opportunity to see how the learners reacted in the improved acoustic classroom. Lastly, the discussions with the teachers enabled me to hear how they feel about the use of the dynamic sound field amplified system.

Components of the Programme Theory Evaluation with its relevance on change underpinned this study. For the purpose of this study I focused on the five steps or levels of theory of change i.e. inputs, activities, outputs, outcomes and impact (Evaluation Exchange, 2006). The practical application of the Programme Theory Evaluation guided the documentation of the teachers' experiences.

The use of dynamic sound field amplification system helped with the early identification of learning barriers and interventions in the three schools. This lessened the number of learners who were wrongly referred to special schools because of poor performance. Teachers' health, high rates of absenteeism and voice fatigue were reduced, and classroom management was facilitated.

The study found that the participants were not aware of the importance of acoustics in the classroom before dynamic sound field amplification system was introduced. They had to speak at the top of their voices and often repeated themselves for their learners to hear and understand. The dynamic sound field amplification system changed all that, the teachers'voices were amplified and that improved the acoustics in the three classrooms. The dynamic sound field amplification system is effective in the overcrowded classrooms where the background noise is normally high; it operates by amplifying the teacher's voice relative to the background noise. The teacher's amplified voice remains constant all the time and equally audible to all learners in the classroom at all the times. (DiSarno, Schowalter & Grass, 2002).

The recommendations of this study are to share the information gathered from the three schools and the two district officials with the senior management of the North West Department of Education. They will be in the position to study the outcomes and assist schools accordingly by deciding if they see the importance of treating acoustics in the classrooms.

KEYWORDS

- Improved acoustics
- English First Additional Language
- Language of Learning and Teaching
- Foundation Phase
- Grade 1 learners
- Teacher
- Audible classroom
- Auditory discrimination
- Curriculum Assessment Policy Statement
- Inclusive Education Policy

TSHOBOKANYO

Thotloetso ya go fokotsa modumo mo motheong wa thuto ka nako ya go ruta le go ithuta Sejatlhapi Puo ya Tlaleletso

Serutwa sa Sejatlhapi se simolotswe mo dikolong go thusa barutwana ba Sejatlhapi eseng puo ya bona mo mophatong wa ntlha. Se se mabapi le tshitshinyo ya Pegelo ya Pholisi ya Kharikhulamo le Tlhatlhobo, e rotloetsang gore Sejatlhapi se rutiwe mo mophatong wa ntlha, go se botlhokwa gore puo ya gae gore ke e fe (Department of Basic Education, 2012). Bontsi ba barutwana mo Afrika Borwa, Sejatlhapi ke serutwa sa bobedi kgotsa sa boraro. Go ithuta puo e ntshwa go tlisa dikgwetlo di le mmalwa, jaaka go tlhalosa kgotsa go ranola medumo ya puo. Bogolo thata jaaka diphaposi borutelo tsa sekole se se potlana di itsege ka modumo o nang le maduo a mantle, mme e bile go thatafaletsa gore morutabana a utlwale go Barutwana botlhe. Go tlwaelegile gore nako nngwe go fokotsa modumo go kgwagediwe digaretene mo matlhabaphefong, le go tsenya tennis bolo mo maotong a ditilo. Go tlisa phetogo tsentse segodisa modumo mo diphaposi. Thuto e e lebeletse tiriso ya sediriswa se se oketsang lentswe *(dynamic sound field amplification system)* e le mokgwe o ka tokafatsang phokotso ya modumo mo phaposi boithutelong.

Maikaelelo a tshekatsheko e ke go bona diphetogo tse di tlisiwang ke phokotso ya modumo, go fitlhella go ruta le go rutiwa Sejatlhapi puo ya tlaleletso mo motheong wa thuto. Tshekatsheko ya thuto e tla kwala tiriso ya dynamic sound field amplification system mo diphaposing the tharo tsa mophato wa ntlha mo di phaposing borutelo ba dikolo tsa Bokone Bophirima. S se dirilwe ka go buisana le barutabana ka dikgetlho tsa bona ka medumo e ba kgoreletsang, mo diphaposi borutelong tsa bone. Barutabana ba ne ba etelwa kwa phaposing borutelo go nna le maitemogelo go bona gore barutabana ba itshwara jang mo phaposing e modumo o fokoditsweng, mme ba kgona go utlwa morutabana wa bone sentle. Sa bofelo dipuisano tsa me le barutabana di nkgonisitse go reetsa maikutlo a bone ka tiriso ya dynamic sound field amplification system.

Programme Theory Evaluation (PTE) ke tsela e e botlhofo e e tshegeditseng thuto tshekatsheko e. Tiori e ka nako nngwe e bidiwa teori ya phetogo *(theory of change).* E bontshiwa motlhala ke tsela ya tshekatsheko e tsweletsang thuto e go dirisa *logic model* le go bontsha se se tshwanetseng go dirwa go fitlhelela dipholo tse di itumedisang. Go tswetsa tshekatsheko e pele ke tlhokometse dikarolo di le tlhano tsa teori ya tiro, jaaka, megopolo, ditiro, selekanyo sa maduo, diphetogo le thotloetso (Evaluation Exchange, 2006).

Diphitlhelelo tse di kokoantsweng mo dikolong di le tharo le badiri ba babedi lefapha la thuto mo tikatikong, di tla abelwana le balaodi ba Lefapha la Motheo la Thuto la Bokone Bophirima go thusa ka dikgakololo tse di maleba mo dikolong. Se se tla ba kgontsha go keleka diphitlhelelo go thusa dikolo go ya ka go bona botlhokwa ba go fokotsa modumo mo diphaposi borutelong.

Ditshekatsheko tsa thuto di fitlhetse gore batsayakarolo ba ne ba sa bone botlhokwa ba phokotso modumo mo diphaposing pele ga tiriso ya dynamic sound field amplification system. Pele ba ne ba tswanelwa ke go buela ko godimo le go boeletsa kgapetsa kgapetsa gore barutwana ba kgone go tshwara le go ithuta. The dynamic sound field amplification system e tlisitse diphetogo mo diphaposing tse tharo tsa motheo. Mantswe a barutabana a na tlhatloga, se o sa tokafatsa sa ba sa fokotsa go tlhodiega. Lentswe a morutabana ha le fetoge, le utlwala ka go lekana ka nako tsotlhe mo morutwaneng o mongwe le o mongwe mo phaposing. (DiSarno, Schowalter & Grass, 2002).

Tiriso ya dynamic sound field amplification system e thusitse go supa bokoa mo go ithuteng mo barutwaneng le thuso ya potlako mo dikolong. Se sa thusa go fokotsa palo e ko godimo ya bana ba ba romelwang ka phoso ko dikolong tse dikgethegileng ka ntla ya go dira bokoa mo dithutong tsa bone. Botsogo bo bo bokoa ba barutabana, go thinya sekolo ka metlha, lentswe le le lapang go ka fokotsega, le phaposi borutelo di se bokete go e laola.

MAFOKO A BOTLHOKWA

- Go tlhodiega go go fokoditsweng
- Sejatlhapi Puo ya Tlaleletso
- Puo serutwa sa go ruta le go ithuta
- Motheo wa Thuto
- Barutwana ba mophato wa ntlha
- Morutabana
- Phaposi borutelo e utlwalang
- Pharologano ka kutlo
- Pegelo ya Pholisi ya Kharikhulamo le Tlhatlhobo
- Pholisi Thuto ya Kakaretso, e sa tlhopholleng.

LIST OF ABBREVIATIONS

ADHD	Attention Deficit Hyperactivity Disorder
AIL	African Indigenous Languages
ANA	Annual National Assessment
APD	Auditory Processing Disorder
ASHA	American Speech-Language-Hearing Association
CALP	Cognitive Academic Language Proficiency
CAPS	Curriculum Assessment Policy Statement
dB	Decibel
DBE	Department of Basic Education
DSAS	Dynamic sound field amplification system
EFAL	English First Additional Language
FM	Frequency Modulation
FP	Foundation Phase
HINT	Hearing in Noise Test
HOD	Head of Department
IEP	Individualised Education Plans
LoLT	Language of Learning and Teaching
MARRS	Mainstream Amplification Resource Room Study
NAL	National Acoustic Laboratory
NWDE	North West Department of Education
AS	Public Address System
PTE	Programme Theory Evaluation
SASA	South African School Act
SN	Signal to Noise
SNR	Signal Noise Ratio
ToC	Theory of Change

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REVIEW OF THE LITERATURE ON IMPROVED ACOUSTICS ON TEACHING AND LEARNING

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CHAPTER ONE

GENERAL ORIENTATION

1.1 INTRODUCTION

"All children need good, clear signals and low background noise ratio (SNR) for full understanding. Improving classroom acoustics is important for all children in schools, particularly for young children in the early grades." (Nelson & Soli, 2000: 356).

It is important for Grade 1 learners' listening skills to be enhanced for learning to occur. However, in many classrooms noise prevents learners from learning optimally (Flexer, 1989). This becomes even more of a challenge when English First Additional Language (EFAL) is introduced to learners, especially in environments where it is mostly heard only in the classroom (Nel & Müller, 2010). The inability to decipher and comprehend spoken English in a noisy background in relation to the listener's competence of the language (Crandell & Smaldino, 1999; Nelson, Kohnert, Sabur & Shaw, 2004).

The elements of acoustics are the level of background noise, reverberation time and the distance between the teacher and the individual learners in the classroom (Crandell & Smaldino, 2000). It is vital to understand the acoustic elements of the classroom that affect proper teaching and learning. Communication in the teaching and learning environment often occurs in less than ideal acoustic conditions. Noisy rooms, inexperienced listeners, reverberant walls and multiple talkers make communication complex (Nelson & Soli, 2000).

Classrooms are generally noisier and more active places today than in past decades. It has been my experience that modern teaching strategies expect learners to interact in the classrooms as they learn. This may create barriers to communication and impose constraints on listeners (Nelson & Soli, 2000), especially when young learners are taught an additional language. There are several options available to improve the listening, speaking, learning and teaching environment in a classroom. One option is to reduce noise levels, for example by

hanging curtains and fitting tennis balls on the legs of chairs to reduce classroom noise (see figure 2.2).

There are already studies which have focused on the non-physical environment in the early grades. However, this study focused on the improvement of the design of EFAL physical learning environments by using dynamic sound field amplification system (DSAS) as one way to improve the classroom acoustics (Nelson & Soli, 2000). It is widely known that South African schools performed below expectations in the 2012 Annual National Assessment (ANA) results. However, not much is known as to why the performance of the Foundation Phase learners is poor (National Education Evaluation and Development Unit, 2012).

Nel and Müller (2010) argue that reasons may be that learners do not have access to English reading materials, newspapers and magazines at home. Exposure to English outside the classrooms is limited, and the impact of teachers' limited EFAL proficiency on English second language learners in South African schools is a further negative factor (Nel & Müller, 2010).

It was after the district officials and I discussed with the school management teams that the decision was taken to work in partnership with the Grade 1 teachers to conduct a study. It was argued that it was of great importance that learners needed to develop literacy skills at an early age: if they were not able to read well by the time they were in Grade 3, the possibility was high that they would have poor reading abilities throughout their lifetime (Brace, 2006). Another challenge mentioned by a Grade 1 teacher was that her learners tended to confuse English First Additional Language (EFAL) sounds. Dynamic Sound Field Amplified System (DSAS) was introduced to help deal with the problems mentioned above. It became evident that it was not only a problem for the children with mild hearing loss; even mainstream learners struggle with auditory discrimination (Millet, 2008).

A study was conducted in Australia in which researchers studied learners experiencing hearing loss (Brace, 2006). The findings of the study were that when learners were able to listen in the classroom, there was a great improvement in their behaviour and participation. As there are no studies available on the role of

acoustics in teaching EFAL in the Foundation Phase in South African mainstream schools, it was deemed worthwhile to undertake this study.

1.2 PURPOSE OF THE RESEARCH

The purpose of this study was to explore how improved acoustics can advance EFAL teaching and learning in the Foundation Phase. The study documented the teachers' experiences when using this innovative technology (DSAS) in three Grade 1 mainstream classrooms in the North West province, South Africa for teaching EFAL. This was done by an investigation through discussing with the teachers their experiences as regards the challenges they experienced about the acoustics in their classrooms and the improved acoustics classroom environment. The classroom observations afforded me a further opportunity to see and document how the learners reacted in the improved acoustic classrooms. In addition, the discussions with the teachers revealed their perceptions and experiences of teaching and learning, utilising the DSAS.

1.3 RESEARCH QUESTIONS

- Primary research question:

  What are the teachers' experiences when using DSAS, teaching EFAL in the Foundation Phase?

  - Secondary research questions:

    - How can DSAS improve acoustics in the teaching and learning of EFAL in the Foundation Phase?
    - How do teachers make use of the DSAS in teaching EFAL in the Foundation Phase?
    - How do learners respond to the use of the DSAS when learning EFAL?
    - What are the outcomes of utilising the DSAS system in the teaching and learning of EFAL in a Foundation Phase classroom?

1.4 WORKING ASSUMPTIONS

The following working assumptions were formulated:

(i) Classroom acoustics are in general not considered important, because learners with minimal and mild hearing loss are not adequately catered for in the mainstream schools.

(ii) The overcrowded classroom can make it difficult for the teachers to be audible enough to all learners.

(iii) Teachers are rarely aware of differing levels of hearing abilities of children and the impact this has on learning, especially the learning of a new language with a different sound system to what they are used to.

(iv) The installation and proper use of DSAS will make the teaching and learning of EFAL in Grade 1 more efficient and effective.

(v) Schools are not aware of strategies for reducing the background noise in the classrooms.

1.5 CLARIFICATION OF KEY CONCEPTS

The meaning of the key concepts used in the study, namely documentation, dynamic sound field amplification system, acoustics, English First Additional Language, home language, Grade 1, the Foundation Phase and teacher are explained in this section.

1.5.1 Documentation

The process documentation is the research approach adopted for this study. The aim of using this approach was to record the lessons using DSAS as they occur with the purpose of feeding information to the teachers and district officials including policy makers. Process documentation is a stepping stone in evaluating a programme as to its effectiveness or not. This study documented the process of the implementation of the DSAS. In documenting the process it is not possible to eliminate reflection as part of the process- thus the results might not be neutral and might have the researchers' own interpretation of the events as they unfolded.

This process however may not be confused with evaluation as the intial intention of the study was not necessarily to evaluate, but to record the events/ implementation of DSAS and how it unfolded.

1.5.2 Dynamic sound field amplification system

Brace (2006) explains DSAS as a device that amplifies the teacher's voice evenly throughout the classroom. Each learner can hear every word, regardless where they are sitting in the class. It benefits learners with hearing impairment, learners with hearing loss using hearing instruments and any other learner. According to Rosenberg, Allen, Redmond, Phillips & Stigers (1995), it improves the listening behaviour of learners.

The teacher wears a microphone with a wireless transmitter to a loudspeaker, which can be free standing or mounted to the wall or the ceiling (figure 2.3). For an average classroom one loudspeaker is enough to overcome any background noise. It operates by amplifying the teacher's voice relative to the background noise; for an example, if there is an aeroplane or a truck passing by, the teacher's voice will remain audible to the learners.

1.5.3 Acoustics

Acoustics refers to the ability to hear and comprehend what is being said in the classroom. Poor classroom acoustics occur when the background noise is high and makes it difficult to listen and understand (Boothroyd, 2004).

1.5.4 English First Additional Language

English First Additional Language (EFAL), also called English Second Language, is English taught to non-speakers of the language. In most schools EFAL is the language of learning and teaching (LoLT) from Grade 4 (Department of Basic Education, 2011). In this study EFAL is taught as a subject; English is not used as the language of learning and teaching to the Grade 1 learners in two of the schools. All learners in the three schools are Setswana or Afrikaans speaking. At the third school EFAL is taught as a subject and English is the LoLT for all Setswana-speaking learners from Grade R.

1.5.5 Home language

Joubert, Bester, Meyer and Evans (2013) state that young children learn to speak in their home environment before they even start school. This is a crucial stage in the development of learners' hearing and speaking skills, vocabulary, general understanding and the forming of the concepts. Proficiency in the learners' home language is essential for learners to acquire an additional language.

1.5.6 Grade 1

A grade is an annual stage in education (Proffitt, 2013). Grade 1 is called first grade or class 1 in some countries. In South Africa learners are expected to be five and half years old, turning six before 30 June (South African Schools Act, 1996), and Grade 1 is the first year of formal education in the primary school. It is preceded by Grade R or 0, where learning is structured as play.

Learners in this grade are expected to be four and half turning five years old before 30 June (South African Schools Act, 1996). The learners in Grade 1 are usually six to seven years old and are taught basic literacy, phonics and reading simple sentences. It is the crucial grade for learners, as it is the foundation of the subsequent formal schooling.

1.5.7 Foundation Phase

In South Africa the Foundation Phase includes Grade R (R for reception year, as the year before formal school commences) to Grade 3 (Department of Basic Education, 2011). In the Foundation Phase, learners are prepared for their entire formal schooling. This is the phase where the learners' basic perceptual skills, such as auditory discrimination, auditory foreground and background are developed. These are the crucial skills that learners need in order to learn a language, more especially English First Additional Language.

1.5.8 Teacher

In general the perception is that all educators are natural teachers. Teaching is not just a job to an educator, it is a calling. A teacher has passion, commitment and strengthens the voices and dreams of learners. An educator is a person who goes further than just educating the learners in the subject content. He/she leaves a permanent mark inside the learners' heart (Sackstein, 2016). Although South African research sometimes refers to educators (Engelbrecht & Greene, 2007), the official term in the South African context is teacher (Department of Basic Education, 2001; 2014). In this study, this is the sense in which the term teacher is used.

1.6 BACKGROUND NOISE IN THE CLASSROOM

This section sought to give an overview of studies related to the background noise of the classroom in the Foundation Phase. This research project focused on the potential strengths and weaknesses that arise from existing studies relevant to this study (Boote & Beile, 2005).

My study examined some current debates in the global and South African context. Gaps were identified to assist with my project and further research on the related topic. The focus of the study was to investigate the challenges that most teachers and learners are faced with, because in most mainstream classrooms background noise make it difficult for quality teaching and learning to occur.

All learners have the right to quality teaching and learning, irrespective of their socio-economic background (White Paper 6, 2001). More often than not, learning environments are perceived as serious extrinsic barriers to learning. "Most classroom management and instruction is oral, with the underlying assumption that pupils can and must detect and attend to the teacher's speech" (Flexer, Millin & Brown, 1990:177). This motivated me to focus on English as a political and economic language, language policy in South African schools, that is English First Additional Language (EFAL). Furthermore the study looked into language development and perceptual skills, teachers' challenges in relation to the classroom acoustics, strategies and techniques for teaching EFAL.

1.7 LANGUAGE ISSUES IN SOUTH AFRICA

The South African population is one of the most complex and diverse in the world. Because of its cultural and ethnic diversity it is seen as the Rainbow Nation. The black population of South Africa is divided into four major ethnic groups; namely Nguni (Zulu, Xhosa, Ndebele and Swazi), Sotho (Setswana, Northern Sotho and Southern Sotho), Xitsonga, and Tshivenda. There are numerous subgroups within the different ethnic groups. The two Nguni subgroups, Zulu and Xhosa are the largest (Race, Ethnicity and Language in South Africa, 2014).

“The majority of the white population (about 60%) is of Afrikaans descent, with many of the remaining 40% being of British or European descent. The coloured population have a mixed lineage, which often comprises the indigenous Khoisan genes combined with African slaves that were brought here from all over the continent, and white settlers” (South African Languages & Culture, 2017;1).

Most of the coloured population lives in the Northern and Western Cape provinces, and they consider Afrikaans as their home language. The majority of the Indian population lives in KwaZulu-Natal. The Afrikaner population is especially concentrated in the Gauteng, North West and Free State provinces and the English population in the Western Cape, Gauteng, Eastern Cape and KwaZulu-Natal (South African Languages & Culture, 2017).

Since the first all-race April 1994 elections, South Africa has reportedly experienced a considerable influx of illegal immigrants from neighbouring countries like Mozambique, Malawi and Zibabwe to name a few. Most of them because of economic reasons settle in rural areas or townships where the medium of instruction in the junior classes will be the spoken language within that community (Kotze &Hill, 1997). However where the research was conducted medium of instruction were setswana and afrikaans. any immigrants would have been integrated or enculturated in the population in which the study was conducted.

1.7.1 South African Constitution

“The official languages of the Republic are Sepedi, Sesotho, Setswana, siSwati, Tshivenda, Xitsonga, Afrikaans, English, isiNdebele, isiXhosa, Sesotho and isiZulu”. The South African government recognises the languages whose status was historically diminished, these were the indigenous languages. They are being elevated and advanced to be considered as official languages and must be treated equitably (Constitution of South Africa, 1996).

The National and Provincial governments have the liberty to use any official languages, the practicality, expense and the context, taking into consideration the preference of the population of the whole province is important (Constitution of South Africa, 1996).

The Pan South African Language Board established by national legislation is tasked to promote and develop the use of “all official languages; Khoi, Nama and San languages and sign language” (Constitution of South Africa, 1996; 1245). Much of the country’s media has been tailored to include as many of these languages as possible. Languages that are commonly used by communities in South Africa are respected, those are, Portuguese, Greek, Italian, French, and Chinese. Furthermore “Sanskrit, Arabic, Hebrew and other languages are used for religious purposes in South Africa” (Constitution of South Africa, 1996:1245).

1.7.2 Language policy in South Africa

The constitution of the Republic of South Africa (1996), and the Department of Basic Education (2001) recognise that our cultural diversity is a national asset. Hence the emphasis is on respecting all languages used in South Africa to build a non-racial nation. In September 2013, Department of Basic Education released a draft policy on the incremental introduction of African languages in schools. The purpose of this draft policy is specifically to look into giving African languages the worth and protection that they deserve and for learners who speak an African language at home and for learners who do not. The draft policy seeks to promote languages that have been historically marginalised and more importantly it is also aimed at promoting the culture and heritage of the African people.

Language is used as an integral part of the government strategy to facilitate communication across the barriers of language, religion and colour (Department of Basic Education, 1997). The support of Alternative Augmentative Communication and South African Sign Language for people with disabilities and speech impairment is also emphasised (Department of Basic Education, 1997).

The Department of Basic Education has given the school governing bodies the powers to select the language policies for their schools. The school governing body is explicitly required to promote the best interests of the community in which the school is located. The language policy should not discriminate against learners on the grounds of their race. However the school's language policy must be within framework that a provincial education department may overrule a school language policy to give effect to learners' rights Learners have a right to learn an African language of their choice, in a situation that is practicable.

1.7.3 English First Additional Language in South African schools

South Africa recognises English as an international language that is important in African countries (Edwards & Newcombe, 2006). Joubert et al. (2013) state that English language proficiency means success, i.e. better jobs and good salaries. Edwards and Newcombe (2006: 140) also agree that in South Africa and other African countries, being fluent in English is associated with 'being educated' and is a prerequisite for being successful.

These reasons inspired the Department of Basic Education (DBE) to introduce English First Additional Language from Grade 1. Introducing English in the Foundation Phase will assist learners to be competent in the language. It is important to introduce EFAL as early as Grade 1, as the learning of this language is a complex process. There is a high correlation between fluency in spoken language and competence in literacy (Joubert et al., 2013), so competence in spoken English will enable learners to access and comprehend their studying material independently.

Pica (2000) states that teachers' focus should not only be on the second-language features. Clark (2007) and Joubert et al. (2013) argue that most preverbal experiences and acquisitions may nonetheless be critical to some aspects of

language development. For example, children need to hear the language prior to speaking; otherwise they would have little motivation to look for a verbal language to learn. This includes hearing correct sounds of both EFAL and home language from the teacher (Nel & Müller, 2010).

1.8 THEORETICAL FRAMEWORK

I used Theory of Change (ToC) for this study where I regarded the implementation of DSAS as the 'programme' or the project. The focus was on Chen's Theory (Chen, 1990) as it is relevant to the study and it gives a step by step approach to guide the researcher with the process to document the teachers' experiences. The concept evaluation, embedded in his theory, is used as it relates to explore the use of DSAS in relation to the documentation of this investigation. The purpose of this research project was to understand the teachers' experiences. In addition, Programme Theory Evaluation (PTE) provided guidance and layed the foundation to document the process for this study; following the different steps. Programme Theory Evaluation should also be perceived as theory of change. The Programme Theory of Evaluation and the theory of change indicated the strengths and weaknesses of the DSAS, so that schools (who are in similar situations) can adapt or change the strategy for the sake of teaching and learning. It was important for me as a researcher to remember to employ and follow the Programme Theory Evaluation process, with the focus on theory of change and follow its linear path, which includes five components: inputs, process or activities, outputs, outcomes and impacts (Chen, 1990).

These components of Programme Theory Evaluation explain the why, how, and under what conditions the programme effects occur, and it further predicts the outcomes of the programme, assists and mentions the requirements needed to bring about the desired programme effects (Sidani & Sechrest, 1999). The Programme Theory Evaluation was important to monitor the success or the failure of the implementation of DSAS and also assisted me when there was an area that needed more attention to improve this implementation. All the above ideas were considered in the theoretical framework regarding the background noise in this study.

Despite the fact that the evaluation theory is used, the aim of the research is not to evaluate the study but to use the steps delineated in the theory to document the implementation of DSAS and the teachers' experiences of using the facility. Components in the theory helped me in focusing in important areas such as the sequence of events and how they unfolded.

1.9 RESEARCH METHODOLOGY

A qualitative research methodology was employed in this study to highlight the effect of the utilisation of the DSAS. It was used as a blue print of the entire research process (McMillan & Schumacher, 2006). The research methodology seeks to guide the study, data collection, analysis and research quality aspects. The qualitative approach is the best for a study that aims to explore how effective teaching and learning take place with the utilisation of the DSAS when improving the acoustics of the classroom environment. This approach enabled me to collect data in the participants' natural environment which I have identified as the classroom (McMillan & Schumacher, 2010).

This study concentrated on documenting the experiences by following the summative evaluation approach to help me to answer the following questions in relation to the utilisation of the DSAS: How are the three schools employing the DSAS? How do we know what their experinces are? Lastly after data collection, analysing it and assessing the effect or the outcome of the utilisation of the DSAS, what are we going to do regarding future recommendations? The research project concentrated on making decisions about the programme's future or adoption in other contexts (Street, 2000).

This study followed a qualitative summative paradigm for I explored**,** and documented the conceptualisation as well as the implementation of the use of the dynamic sound field amplification system~~s~~ (DSAS) in Grade 1 EFAL teaching (Mouton, 2012). The techniques that I employed during the sampling, data collection, data documentation and data analysis processes (Ferreira, 2012). For the purpose of my study I chose the thematic analysis approach, in that I sought to identify themes and categories in my research.

Marlow (2005:334) defines exploratory research as: “A form of research that generates initial insights into the nature of an issue and develops questions to be investigated by more extensive studies”. Exploratory research or formulative research is employed when data is difficult to collect and large amounts of unstructured information are collected to explore a new topic. Exploratory research is flexible and can address research questions of all types (what, why, how) (Marlow (2005). The exploratory qualitative research was appropriate for my research questions to get a vivid picture of benefits of the utilisation of the DSAS during the EFAL teaching and learning in the Grade 1 classes. I was clear about the purpose and the possible outcomes of the study (Alston & Bowles, 2003).

1.10 SAMPLING

Criteria for selection of schools

The three schools, studied had all recently submitted requisitions for DSAS as assistive devices for the foundation phase, and they were supplied by the North West Department of Education, one of the nine provinces in South Africa which is predominantly Setswana speaking. They were delivered one month before I start with my study. All the three schools have Grade R, but the Mooi School’s Grade R class is privately owned. The buildings are made of bricks and mortar. The average age of the learners was six years turning seven years in Grade 1. In one school, Makgona, the Grade 1 classroom was overcrowded, with 63 learners in one classroom. In the other two classes the number of learners was manageable (31 and 36 learners respectively).

The schools are primary mainstream schools which accommodate learners with different abilities. The communities around the three schools have different socio-economic backgrounds. Makgona is in a rural community, with a poor socio-economic background. Mooi is in a farming community with an average socio-economic background. Swallows is in an urban community, with a good socio-economic background.

The documentation of the teachers’ experiences in the three schools in the same district and same district was conducted. The unit analysis of this study was three Grade 1 teachers. The observations for the study were conducted in the three

Grade 1 classes and were supplemented with data from the participants through semi-structured interviews conducted with three teachers, one class assistant, one HOD, two principals and two district speech language therapists and audiologists. Lastly informal talks were conducted with the Grade 1 learners.

The research followed a purposeful sampling technique. The study was conducted in the Grade 1 classes of three different mainstream schools selected from different geographical locations, namely rural, farm and urban. In two schools English is taught as a subject up to Grade 7. However, in the third school English is a language of teaching and learning from Grade 1 to Grade 7, even though none of learners and teachers are English home language speakers.

Detailed profiles of the three schools based on their challenges, strengths and the socio-economic background of the learners will be discussed later in the study. All that information was important to enrich the data.

1.11 DATA COLLECTION METHODS

The purpose of data collection is to collect information and document it to intensify the understanding of the study. Data were collected using semi-structured interviews, observations, journals, photos and field notes (McMillan & Schumacher, 2006). Classroom observations and interviews were recorded in the journal. The captured notes helped me to be reflective and mindful of researcher bias.

1.11.1 Observation

Data was collected by observing the use of the DSAS during the teaching and learning of EFAL. Observation is a subjective, but structured approach. It allows the researcher to collect data without questioning the participants (Seabi, 2012). Reports on observations, including non-verbal expressions of feeling, and what I heard were recorded and kept in the form of field notes (Silverman, 2000). Photos were taken of the classroom settings to show the three different learning environments.

1.11.2 Semi-structured interviews

A conversational, open-ended interviewing style (Seabi, 2012) was adopted for the semi-structured interviews with the participants (see 1.9.2). One on one thirty to forty minutes interviews were conducted with teachers, class assistant, principals, HOD, during school breaks. Thirty minutes informal talks were conducted with the Grade 1 learners in the classroom after the EFAL lesson. The forty minutes one on one interviews were also conducted with the district speech language pathologist and audiologists during lunch time in their offices. Semi structured interviews were conducted with teachers, class assistant, principals, HOD, district speech language pathologist and audiologists to obtain triangulation of data obtained from the observation and informal talk with the Grade 1 learners. Follow-up questions were allowed, and the interviews were recorded on tape and transcribed the same day. The obtained data were analysed to discover themes which formed the basis of discussion in the study. Research methodology and data collection methods are further discussed in detail in Chapter Four.

1.11.3 Field notes and journal

Learners' and teachers' behaviours during classrooms observation were noted in field notes. The reflective journal ensured that my personal bias and opinions were not reflected during data analysis and interpretation (Seabi, 2012). Therefore methods and procedures do not guarantee validity, they are nonetheless essential to the process of ruling out validity threats and increasing the credibility of my conclusions.

1.12 DATA ANALYSIS

"The aim of analysis is to understand the various constitutive elements of one's data through an inspection of the relationship between concepts, constructs or variables, and to see whether there are any patterns or trends that can be identified or isolated, or to establish themes in the data" (Mouton, 2012:180). In a qualitative study, data collection, processing, analysis and process should never be viewed as a linear process, but as a continuous process (Nieuwenhuis, 2007). Schurink, Fouché and De Vos (2012) elaborate that analysing data is a process of inductive and deductive *(tests before, during and after)* reasoning. It is treated as

science because of the credible evidence that is collected for the study, but it is also an art, because it allows creativity and ambiguity (Maree, 2011).

.The main aim of data analysis is to draw meaningful and trustworthy conclusions, without favour or bias. To this end, the following six steps were followed in my study. However, these steps are only regarded as guidelines, and most of them overlap (Schurink, Fouché & De Vos, 2012). As part of the inductive process the interview and classroom observation data were transcribed. Concepts that emerged from the data were identified, coded and then grouped together to form the themes.

The data analysis process ran concurrently with data collecting. Data analysis started immediately when the interviews and observational information were collected. Recordings were transcribed immediately to get a clear understanding of the information gathered. The information assisted with the understanding of the Grade 1 learners and their teachers' experiences of the utilisation of the DSAS.

1.13 ETHICAL CONSIDERATIONS

Ethics deals with beliefs about what is right or wrong, proper or improper, good or bad (McMillan & Schumacher, 2006). The importance of ethical aspects must be acknowledged (Ferreira, 2012).

The ethical issues were discussed with the teachers, the parents of the Grade 1 learners and the management of all the three schools. I followed ethical standards and was at all times open and honest and explained the aim of the study (McMillan and Schumacher, 2010). The participants were informed about their right to withdraw from the research at any stage (Babbie & Mouton, 2001; Loots, 2011). The participants were assured of confidentiality, and they were treated with great respect throughout the study. Pseudonyms were be used to protect the participants' identity (Babbie & Mouton, 2001).

The research was conducted in accordance to the terms and conditions of ethical regulations of the Faculty of Education, University of Pretoria. I was granted permission by the North West Department of Basic Education to conduct the

research. The teachers, class assistant, the parents of the Grade 1 learners and the Grade 1 learners were informed about the study.

1.14 LIMITATIONS OF THE STUDY

Issues related to limitations of this study centred on the following; the study focused on three schools, within the North West province only. Some learners were not free to talk about their different perspective about the use of the DSAS; they could have influenced each other. As a district official, the principals, teachers and class assistants could have felt obliged to participate in the study.

Fieldwork was done when I also had my full time duty as a Deputy Chief Education Specialist with the Department of Education; hence time constraints were limitations that could have affected the depth and breadth of data collection. Lastly, I had secured the budget for my research project, I later realised that it was not enough.

1.15 OUTLINE OF CHAPTERS

This study is organised into six chapters as follows:

Chapter 1 presents an overview and the broad outlines of the study under the following headings: introduction, background of the study, rationale of the study, aim of the study, research questions, research methodology and data analysis process. Key concepts of the study are also explained.

Chapter 2 is about the international and local literature on acoustics in classrooms for young learners with mild hearing impairment who are not English speakers, with specific emphasis on the Foundation Phase. Furthermore Chapter 2 presents the theoretical framework of theory of change, which was applied in the study. It focuses on the theoretical framework as the foundation of my research study as it provides an overview of perspectives and research results with specific reference to the topic. The theoretical framework charts the process the study will take. In this case a new assistive device was introduced in class, and it is important to evaluate its impact on learning – hence Chens' theory of change.

In Chapter 3 the research design, research site, sampling, data collection process and data collection instruments are discussed. Chen's programme theory of theory (Chen, 1990) is explained. Ethical matters and the roles of the researcher are addressed.

Chapter 4 focuses on the results of the data analysis and key themes that emerged from the data. Collected data is analysed and the categories are established.

In Chapter 5 the findings are discussed with reference to each research question and literature. The findings are interpreted. Recommendations are made to the North West Department of Education. Lastly recommendations for further research are discussed.

1.16 CONCLUSION

This introductory chapter provided a complete overview of the trajectory of this study. The study in the correct South African context and clarified purpose, primary and secondary questions and the rationale behind this study has been clearly stated. The research methodology, objectives, data collection, and analysis were highlighted. The need to research and document the evaluation of the use of the DSAS in the Foundation Phase was justified.

Chen's Programme Theory of Change was introduced as a model that guided the study on the evaluation of utilising the DSAS. The importance of ethical considerations and limitations of the study was summarised. Lastly the outline of six chapters has been clearly explained. Chapter two contains a critical review of the literature on improved acoustics**.** It focuses on background noise, the importance of the classroom acoustics and the utilisation of the DSAS and the feedback from different studies.

CHAPTER TWO

REVIEW OF THE LITERATURE ON THE EFFECT OF IMPROVED ACOUSTICS ON TEACHING AND LEARNING

2.1 INTRODUCTION

This chapter reviews the literature on the use of the dynamic sound field amplification system in teaching EFAL in the Foundation Phase. It focuses on classroom background noise, the importance of classroom acoustics, the use of the DSAS and the findings of such research.

The introduction of English First Additional Language (EFAL) and related challenges**,** such as the interference of the classroom's background in deciphering unfamiliar sounds and words in learning the language**,** are fundamental to the discussion in this chapter. More often than not, learning environments are found to put up serious hurdles to learning and they are perceived as extrinsic barriers to learning. "Most classroom management and instruction is oral, with the underlying assumption that pupils can and must detect and attend to the teacher's speech" (Flexer, Millin & Brown, 1990:177). It is crucial for the teacher's voice to be clear and distinct to all learners in class.

This chapter concentrates on the learning environment and its effects on learning, the importance of acoustics in studying EFAL as a subject and as a language of learning and teaching (LoLT), improving classroom acoustics, teaching strategies and technique, teaching and learning and language development. This study examined some current discussions in the global and South African context on the DSAS.

2.2 THE LEARNING ENVIRONMENT AND ITS EFFECT ON LEARNING

Learning environment refers to a physical setting, an educational approach or cultural context in which teaching and learning occur. The learning environment term is commonly used as an alternative to classroom. It however encompasses a variety of learning cultures, ethos and governing structures. Learning

environments are highly diverse by nature, the culture, religion, learning styles, educational institution, location, communities and beliefs play an important role in the teaching and learning process.

For the purpose of the study I only looked into two types of learning environment, that is the classroom and outside the classroom setup (Dewey, 1944).

Classroom setup: This is the environment in which often adults in these instance teachers consciously control the kind of education which the immature get. The teachers do this by controlling the environment; this includes the arrangement and the teaching approach. Environment has a great impact on how effective and efficient teaching and learning can take place (Dewey, 1944).

Outside the classroom setting: Classrooms are not the only settings for effective and efficient teaching and learning. More and more teachers are using out of classroom settings as learning environments. Learners become educated through experience rather than just theory. Experiential learning is placing learners and their learning in a real environment that is relevant to their prior knowledge and the new knowledge that they need to acquire (Dewey, 1944).

This study concentrated on the classroom as a learning environment.

2.2.1 Studies on the importance of the learning environment

> ***"Speech produced in one place in a room should be clear and intelligible everywhere in the room."*** (Nabelek & Nabelek, 1994).

The above statement describes noise interference in a classroom with a background noise can be an extrinsic barrier to learners. Teachers and learners deserves to be in a well-structured learning and teaching environment with low background noise levels and minimal reverberation. Poor acoustic classrooms is still a common problem globally. For an example the majority of classrooms in the United States of America (USA), Australia, New Zealand and South Africa are faced with the same challenge (Wilson, 2002 and Ramma, 2009).

It is a wearying task to try to present a lesson in an excessively noisy and reverberating room. Learners and teachers need a learning environment where all

significant background noise is eliminated. This is particularly essential to both students and teachers during the Foundation Phase.

There are different ways in which knowledge of the world outside the classroom can assist learners to acquire EFAL; these are:

(i) Making it visual, that is, familiar concepts should be diagrammed or supported with pictures.

(ii) Learners should be allowed some ‘scaffolding’ using their native language.

(iii) Looking out for culturally unique vocabulary and learn about the cultural background of learners (Gonzalez, 2014).

2.2.2 South African teaching environment

> *“The environment consists of those conditions that promote or hinder, stimulate or inhibit the characteristics of a living being”* (Dewey, 1944).

According to the National Education Policy Act (NEPA) 27 of 1996, there is a direct link between the physical environments in which learners are taught, teaching occurs, as well as learning outcomes. The NEPA emphasises the impact of poor learning environments as contributor to learners' irregular attendance and dropping out of school, teachers' absenteeism and the teaching and learning processes.

NEPA (1996) stated that typical South African schools environment still does not provide a physical environment that enables the implementation of policies, such as Inclusive Education, progressive curricular, co-curricular activities and the standard of quality, equity, efficiency, relevance and values. This is evident in the low academic performance of learners. The conditions of learning and teaching environments play a vital role in education, as they impact on learners' outcome and teaching ability.

This study looked into how the classroom as learning and teaching environment can be conducive for both learners and teachers, how the acoustics can be treated. Furthermore the study looked into the teaching and learning of EFAL with the assistance of the treated acoustics.

It is very clear that the outside world can supply more language input. Living in the community or neighbourhood where EFAL is spoken can result in an all-day lesson. This can be during break and at home when learners are playing. This does not negate the fact it is important for learners to hear the EFAL in the classroom and outside the classroom, but the informal environment will be increasingly important as the learner progresses and can understand EFAL better. The classroom alone will probably never be able to overcome its limitations (Krashen, 2002).

The ability to understand spoken English in a noisy place is also related to the listener's proficiency in the English language. It is more difficult for the non-speaker of English to hear and understand in a noisy place than it is for the native English speaker (Shield & Dockrell, 2003). Learners in the United Kingdom, primary schools who were not English speakers performed significantly worse in the Hearing in Noise Test (HINT) than the age-matched learners who were native speakers of English. Learners whose first language was English understood sentences at -4 dB Signal-Noise Ratio (SNR). Signal-to-noise ratio (SNR) is defined as the received signal and background noise in a classroom, often expressed in decibels (Segen's Medical Dictionary, 2012). Learners whose home language was not English and with poor vocabulary required the most favourable learning and teaching environment with SNRs of + 1 to -3 dB for them to comprehend classroom discussions (Gelnett, Sumida & Soli, 1994). It was the same case in the three schools where the study was conducted. This made me suspect that the Department of Basic Education does not see the urgency of treating acoustics in the junior classes.

The International Labour Organization (2012) states that education is the fundamental building block for a strong and independent individual; it is the key to sustainable development, supplying learners with critical skills and tools for the future. To ensure optimal outcomes for learners, enabling learning environments

are essential. This includes a healthy environment where all learners can be able to learn and teachers can be able to teach. One important factor for that to be achieved is having audible teachers.

In South Africa; public schools are faced with numerous challenges, which may negatively influence the learning environment and subsequent academic performance of learners. According to the 2010 Education Statistics in South Africa (2012) report, most rural and village school buildings and classrooms cannot meet size requirements for the number of learners admitted to schools. This negatively affects academic performance, with learners in rural or village school being more affected because of overcrowding (Earthman, 2002). Ready, Lee and Welner (2004) mentioned that few learners have been reported to pass reading and mathematics proficiency tests in overcrowded classrooms. It is difficult for most learners to perform to the best of their ability in the noisy overcrowded classroom.

Classrooms are often filled with distractions that hamper learners' ability to listen and learn. It is obvious that a poor acoustical environment in a classroom can be one such distraction. Background noise and reverberation affect the achievement and academic performance of learners with mild hearing loss and those with normal hearing sensitivity who have other auditory learning difficulties, as well as Foundation Phase learners with no verbal or hearing disabilities (Gotaas & Starr, 1993).

Poor acoustical design in classrooms can result in loud noise that disrupts the teaching and learning process for both the teacher and the learners in the classroom. Poor acoustics impact negatively on all learners, not just those with hearing loss. Learners with hearing aids and cochlea implants are commonly found in classrooms used by learners with hearing loss (Shield & Dockrell, 2003).

Ryan and Logue-Kennedy (2013) explained that because of poor acoustics in classrooms, and the fact that most learning is accomplished through hearing, learners with auditory processing disorders display more prominent symptoms of the specific learning barriers during early education. More often than not these learners find it difficult to differentiate the important auditory information, such as

the teacher's voice, from insignificant auditory information, such as other learners chatting in the classroom (DeBonis 2015; Ryan & Logue-Kennedy 2013; Northern & Downs, 2002). Learners with auditory processing disorder find learning more challenging, and their academic performance is negatively influenced to a great extent (Ryan & Logue-Kennedy 2013).

Shield and Dockrell (2003) argued that classroom acoustics is another challenge that may result in an unconducive learning environment for many learners and is something that has been neglected in education. This is of particular concern in Foundation Phase education, because a learner's ability to recognise and understand speech in an adverse listening environment does not mature until teenage years (Johnson 2000). Therefore, Foundation Phase learners need a more favourable signal-to-noise ratio to fully understand verbal communication (Johnson 2000). Leung and McPherson (2006) stated that a good listening environment in schools is critical to cognitive, social, speech and language development. Learners must be able to use their listening abilities to achieve success in learning (Johnson, 2000; Page, 1995).

According to Department of Basic Education (DBE) (2011), the main skills in EFAL are listening, speaking, reading and writing. The maximum time allocated for EFAL in Grade 1 is 3 hours per week. Diagram 2.1 below shows how important it is for learners to listen in order to learn; listening and speaking have been allocated more time than other skills. Learning activities in the classroom encompass listening to learn and participating in verbal communication (Prakash, Rangasayee & Jeethendra, 2011; Ramma, 2009).

Diagram 2.1: The maximum time allocated for EFAL in Grade 1 (DBE, 2011)

Noise makes it difficult for learners to concentrate on lessons by preventing verbal communication and decreasing the learning experiences and problem-solving skills of learners in general (Shield & Dockrell 2003). Causes of observed noise pollution in schools are many, including but not limited to the poor acoustic design of the buildings, failure to use sound-absorbing materials and overcrowded classrooms (Polat & Buluş-Kırıkkaya 2007; Tamer-Bayazıt, Küçükçifçi & Şan 2011).

Foundation Phase learners are still developing EFAL and are less able to distinguish between speech and noise (Nelson, Sacks, & Hinckely, 2009). Learners experiencing different learning barriers, for example auditory processing disorders, developmental delays and otitis media, are often negatively affected by poor acoustics during teaching and learning.

Gotaas and Starr (1993) argue that teachers experience a greater number of vocal problems than the general population. Vocal strain is a serious occupational hazard for teachers and occurs because the Grade 1 teachers experience high vocal demand daily, especially in group work teaching, where the teacher is expected to use her loudest voice. They tend to use their raised voices intensively for a prolonged time because classes are overcrowded. Teachers experience a higher incidence of voice problems than the general population.

Teachers are at risk of vocal injury if they need to overcome the classroom noise to be heard by learners. Teachers should be able to use a natural teaching voice free from vocal strain. For this reason, sources of noise must be eliminated or reduced for both the teacher and learners to create a conducive learning environment (Gotaas & Starr, 1993), as they create an unhealthy working environment (Gotaas & Starr, 1993). Vocal fatigue leads to increased stress among teachers and consequent high absenteeism. It also has an effect on a teacher's career if not treated properly (Gotaas & Starr, 1993). For learners, learning can be difficult if the teacher is not audible.

The building structure is important. The materials used to construct the environment of teaching and learning should be approved by the World Health Organization (WHO) (Hören, 2004) to reduce excessive noise. Classrooms should be positioned in such a way that the exterior noise from traffic and playgrounds is minimised. Again, noise within the school building and within the classroom can be excessive (Wilson, 2002).

2.3 ENGLISH AS A LANGUAGE OF TEACHING AND LEARNING: CHALLENGES

The Department of Basic Education is faced with the major challenge of lack of competent EFAL teachers in the Foundation Phase, more especially in the rural and farm schools. The teachers in traditional black schools often lack the proficiency in English that is essential for effective teaching and learning. Teachers often do not have the knowledge and skills to support EFAL teaching and learning across the curriculum (Rossouw, 1999 & Lemmer, 1995).

There is a need for effective teaching and support for the young learners to acquire EFAL. It is of great importance for learners to acquire EFAL, because it is the language of learning in Grade 4. It is therefore important to have teachers who are conversant with and competent to teach EFAL in the Foundation Phase. The implication of the Curriculum Assessment Policy Statement (CAPS), EFAL in the Foundation Phase Grades 1- 3 is that teachers must have good knowledge and skills to guide learners to develop communicative and reading skills in the first additional language, which in this case is English (DBE, 2011).

South Africa recognises English as an international language that is important in African countries (Edwards & Newcombe, 2006). Joubert, Bester, Meyer & Evans (2013) state that English language proficiency means success, i.e., better jobs and good salaries. Edwards and Newcombe (2006) also agree that in South Africa and other African countries, being fluent in English is associated with 'being educated' and is a prerequisite for being successful.

The introduction of EFAL in the Foundation Phase will assist learners to be competent in the language. It is important to introduce EFAL as early as Grade 1, as the learning of this language is a complex process. There is a high correlation between fluency in spoken language and competence in literacy (Joubert et al., 2013), so competence in spoken English will enable learners to access and comprehend their study material independently.

De Witt, Lessing and Dicker (1998) state that learning and changing over to the first additional language can be a traumatic experience. On average it takes a learner up to seven years to acquire adequate skills in a first additional language. Lolwana (2004) argues that proficiency in the medium of instruction is the "largest single factor affecting learner performance at school". Lack of proficiency in English is the primary reason for the high Grade 12 failure rate. Even though this was said by Free State teachers about their province, it is a national crisis (Smith, 1999).

Pica (2000) stated that teachers' focus should not only be on the second-language features, but also on the learners' home languages. Clark (2007) and Joubert et al. (2013) argue that most preverbal experiences and acquisitions may be critical to some aspects of language development. For example, children need to hear the language prior to speaking; otherwise they would have little motivation to learn a spoken language. This includes hearing correct sounds of both EFAL and home language from the teacher (Nel & Müller, 2010). There is general agreement that if we want to take the task of foreign language learning seriously, then the earlier we do it, the better (Crystal, 2003).

English is at present taught as a second language in over 100 countries (Crystal, 2003). This is because it is hugely important as an international language and

plays an important part even in countries where the United Kingdom has historically had little influence. One example: in 1996, English replaced French in schools in Algeria, which is a former French colony (Crystal, 2003). English is still used as an official language in several countries (including South Africa) even though these countries are independent of British rule.

African indigenous languages (AIL) are associated with the inferior education that was offered under the Ministry of Bantu Education. During the apartheid era, indigenous language education was considered a strategy by the apartheid government to prevent Africans' upward mobility and ensuring availability of cheap labour. Parents' memories of Bantu Education and their perception of English as the key to a better education, better life, and better economic empowerment encouraged black parents to favour English as LoLT (Beukes, 1992). English is still perceived as the language of prestige and power; African languages are maintained as a solidarity code (Gough, 2014).

Young (1995) and Pica (2000) state that English is the international language that is mostly used in economic, political and academic contexts. It is perceived as a language of development. Pica (2000) claims that it transforms underdeveloped traditional societies into modern, educated, technologically competitive and affluent societies. English provides a competitive advantage, but only if coupled with appropriate educational credentials like recognised qualifications (Grin, Sfreddo & Vaillancourt, 2010).

Moyo (2009), states that English enjoys prestigious official status as a lingua franca, irrespective of the few people who speak it as compared with those who don't. Crystal (2003) explains that for a language to be considered as an international language has nothing to do with the number of people who speak it. It has everything to do with who those people are. English is used in education, jurisdiction and in all other government-controlled and non-government institutions (Osborn, 2007).

Van Parijs (2010) explained that English as a lingua franca in Europe and across the world enables not only the rich and the powerful, but also the poor and the powerless to communicate, debate, network, cooperate, lobby and demonstrate

effectively across borders. Egan and Farley (2004) agreed that English is a common international language. Joubert et al. (2013) also share these views and explain that English is a lingua franca, used for wider communication and in a large range of linguistic and social contexts and domains.

According to Beukes (1992), the unwillingness of many black South Africans to use indigenous African languages (IAL) as LoLT comes from their fear that they will remain 'hewers of wood and drawers of water' if they do not have a good command of English. African parents strongly believe that English will open doors for their children. It is the language of empowerment; their aspiration is for their children to be taught in English (Gules, 2005; Kgosana, 2006). AILs are still given a lower status than English. This is a serious matter, as African parents prefer English to their indigenous languages. Parents consider AIL to be good for social purposes, but not for education (Alexander, 2002). They will rather take their children to an unregistered school where they will be taught in English, often by unqualified teachers not registered with South African Council of Teachers (SACE) (Osborn, 2007).

Brutt-Griffler (2005) believes that English plays a vital role in promoting social mobility in low-income countries in Africa and elsewhere. She further criticised those who support the teaching of mother tongues over English as being insensitive to the economic aspirations of oppressed and impoverished people as they continue to seek to escape poverty by being competent in English. This is a great challenge in the sense that more often than not these are the children who will hear and learn wrong English sounds from their parents. Undoing all these mistakes becomes a serious challenge for the teachers. Parents are quick to teach their children the names of the letters of the alphabet, whereas Grade 1 teachers prefer to teach them the sounds.

Von Grunewaldt (1999) and Sarinjeive (1999) mention that it is important for children to learn to function in their home language up to the cognitive/academic language proficiency (CALP) level. This gives a child the tools to be able to transfer to the new language easily. Learners are more successful in acquiring a first additional language if they have already mastered strategies for negotiating meaning in print in their home language (Von Gruenewaldt, 1999; Sarinjeive,

1999). Therefore the process of language development should not ignore the importance of the children's home language.

2.4 LANGUAGE DEVELOPMENT OF YOUNG LEARNERS IN EFAL

The initial signs of communication occur when a baby learns that a cry will bring food, comfort and cuddles. Newborns begin to recognise important sounds, such as their mother's or nanny's voice (ASHA, 2005). As they grow, babies sort out the speech sounds that compose the words of their language. By 6 months, most babies recognise the basic sounds of their home language.

Children differ in their development of speech and language skills, but follow a natural progression for mastering the skills of language. More often than not, delays may be caused by hearing loss, severe ear infection or a speech or language disorder (ASHA, 2005). The home language is the language that the child first hears at home. It is the communication tool. The child has the ability to learn to hear and speak the home language; the ability to express himself or herself is crucial before starting school (Benson, 2005).

The national curriculum and assessment policy statement assumes that all learners who go to school for the first time are able to speak and comprehend their home language (DBE, 2011). This is not the case with all learners. It remains the responsibility of the teachers to be aware of the content, concepts and skills to develop the language of the learners. According to DBE (2011), teaching learners to acquire good language skills is a process. For the purpose of the study the focus is on EFAL teaching and learning. However the DSAS is a device that amplifies the teacher's voice at all times to teach all the subjects.

Thorough language practice includes hearing English first additional language inside and outside the classroom. The daily routine of the home provides the opportunity for children's language to be developed. Brown (1994) states that few people can achieve fluency in a foreign language solely within the confines of the classroom. They should be aware that if they do not use the language, they will lose it. Both teachers and learners should be encouraged to use English on a regular basis as a practice.

The above mentioned practice had started in all of the three schools selected for this study. Learners make mistakes, but they are encouraged to use English in basic communication, for example in their greetings. This helps develop the love of and the competency in the language. A competent learner is one who understands and speaks English confidently and who has the ability to use it correctly in various situations. This competence can only be achieved if the classroom acoustics are conducive and learners are able to hear the teacher well (Lundquist, 2003).

English remains a second language for most people, used in administration, education and government and as a means of communicating between speakers of diverse languages. English plays a part in the cultural, political and economic life of most countries, and compared with French, Spanish and Arabic, Crystal (2003) argues that English is becoming the world's international language. Schutz (2005) shares the same view, pointing out that English has become the official language of the business and scientific world.

The pressure to comprehend English also exists in the academic fraternity (Bakopaulos, 1997). Bakopaulos argued that English is widely accepted and has become the language of choice for many international scholarly journals. Scholars are left with no choice but to publish in English in order to obtain international recognition. Crystal (2007) added that without a common language, conversation between scholars from different nationalities, in both virtual and real world, would prove difficult, if not impossible.

English is taught as the principal foreign language in most schools in Western Europe. It is also an essential part of the curriculum in far-flung places like Japan and South Korea. English is increasingly seen as desirable by millions of speakers in countries that are considered to be well developed, such as China, Germany, Spain, Brazil, Egypt and Finland. It is gradually emerging as the main second language to be found in schools in those countries, often displacing other languages in the process (Crystal, 2003). All learners in South Africa are expected to learn English; hence it is now introduced in Grade 1 as a first additional language to the non-native speakers of the language.

The introduction of EFAL in the Foundation Phase faces challenges, ranging from lack of well developed phonological awareness skills of learners, expertise among those who are supposed to teach it, mispronunciation of words, which distorts the meaning and background noise as a distraction (the latter being the focus of this study).

There is a link between phonological awareness and reading ability that has been shown in languages such as English, Dutch, French, Finnish and German, and local languages i.e. Sotho and Nguni (Pretorius & Spaull,2016). Phonological awareness is vital because once that skill is developed a learner can manipulate phonemes by blending them, and generate new word (Cisero & Royer, 1995). These are basic skills required to be able to read and spell correctly. Once the phonological awareness skill is developed in the acquisition of the first language, it will be transferred to the second language (Anderson, 2004). The success with which a learner is able to make such transfers depends not only on the level of phonological awareness skill but also on the linguistic characteristics of the two languages in question.

The languages that are in question in this study are Setswana and English; Afrikaans and English. The less complicated the phonological structure of the language, the less sensitive to phonological awareness the child seems to be (Yeong & Liow, 2012). This variation of phonological awareness skills development could apply to Setswana home language learners in the EFAL environment. Setswana has a smaller vowel system, consisting of 7 basic vowels, four raised vowels and no diphthongs (Cole, 1955). In contrast, English has 19 vowel sounds (Bekker, 2009). Additionally English differentiate long monophthongs, Setswana does not. This means that the Setswana speaking learners have developed less advanced phonological awareness skills to discriminate between the vowels and the diphthongs of EFAL (Seeff-Gabriel, 2003).

Afrikaans has transparent orthographies. English is different, the spelling-sound relationship in an opaque orthography, such as English, is less direct, and readers have to learn unusual spellings of irregular words such as "enough" and "neighbour "(Downing, 1972).

For the purpose of this study it is important for the differences of the three languages to be identified. This also assist the teachers to not only assist to develop EFAL phonological awareness of the learners, more importantly to use the correct pronunciation for learners to hear her amplified voice uttering correct English sounds.

2.5 TEACHING EFAL: STRATEGIES AND APPROACHES

Teaching strategy is regarded as a careful long term plan of action chosen to achieve a particular goal. Teaching approach is perceived as one's view point towards teaching. It is a set of beliefs, principles and ideas about learning which is translated into the classroom, with specific focus on achieving the objective of the lesson.

2.5.1 Applying EFAL strategies to teach learners

Although good acoustics are important in the teaching and learning environment, there is still an urgent need for dedicated, knowledgeable, self-driven teachers to teach learners with different abilities in order to make the introduction of English First Additional Language a success. It is essential for a competent EFAL teacher to have a plan or method as strategy for achieving a particular goal to assist his or her learners to acquire EFAL.

Harcombe (2003) mentions an integrated specifically with the introduction of teaching EFAL as a strategy for teaching. This strategy accommodates successive and simultaneous processors. Successive processors are learners who are analytical and sequential, who are able to put pieces together, for example remembering the order of digits in a telephone number. This is an essential skill for learners to learn to read. Simultaneous processors are learners who prefer starting from a general concept or global picture and then going to the specifics to understand. The integrated of teaching EFAL accommodates both simultaneous and successive processors' learning styles; learners with different abilities are accommodated and benefit from this. It is vital for learners to develop both successive and simultaneous processing skills as they are essentials in most tasks, for example, acquiring second language, learning to read and write (Harcombe, 2003).

It is important for learners to be competent in English when it is used as a medium of instruction, because they learn and are assessed in English. Learners should not be expected to relinquish their home language. However, for learners to acquire English they should be encouraged to use it as much as possible inside and outside the classroom with their peers and in their groups (Nel, 2014).

Group works, teamwork, partnerships and group discussion is a collaborative approach that is effective and allowing learners to work on different activities. This suggests the common planning, decision-making and problem solving from all members of the group. Through this process, each learner has the opportunity to contribute his or her experiences, information, knowledge and skills to the other learners, in a spirit of teamwork, support and respect, as opposed to an attitude of competition (Engelbrecht, 2004). One advantage of smaller groups is that it allows more talking time and different opinions. Group work can be noisy, and it is critical for the teacher to have the ability to organise groups very well.

However, group work is not ideal for all learners; some learners prefer to engage directly with the teacher. The teacher should always be well aware of learners' strengths and preferences insofar as they affect the learners' academic performance. Once a teacher is aware of and understands individuals' differences, she will be able to take the same learning task and adapt it according to the learners' strengths, i.e. their learning styles.

2.5.2 Applying EFAL approaches to teach learners

Nel (2014) mentions four approaches that are used in combination to learn EFAL. They are:

(i) **Community language learning:** Learners form a circle, the "knower" stands outside the circle, she translates what learners want to say, changing and making suggestions whenever necessary. Their utterances are recorded; learners listen to them later on and reflect.

(ii) **Suggestopaedia:** Learners are supposed to be in a relaxed and comfortable environment. The teacher reads a story with baroque

music in the background to help learners concentrate. This is followed by a time of silence.

(iii) Total physical response: The teacher gives instructions while modelling actions and the learners follow. The teacher repeats this process and if the learner is able to respond correctly, she gives instructions to the class. The learners are expected to listen first and watch the movement before they can speak.

(iv) The silent way: The teacher does not say much. The learners are expected to create language instead of remembering what they have been taught. The teacher uses gestures and actions when the learner is supposed to speak. She shows learners the sounds and words, if the learner is correct the teacher moves to the next item.

Nel (2014) emphasises that listening is the same as reading in that it involves comprehension. Effective listening provides the basis for developing or acquiring language skills. It is crucial for learners to hear a new language more often they start speaking. The same principle applies in learning EFAL.

2.6 NOISE LEVEL IN THE CLASSROOM WHEN TEACHING EFAL

The signal-to-noise ratio (SNR) is defined as the ratio of the power of a signal *(meaningful information)* to the power of background noise *(unwanted signal)* **(**Crandell & Smaldino**,** 2000**).** In an empty classroom the noise level should be about 15 dBA *(decibels as perceived by the human ear)*, and never exceed 35dBA **(**Crandell & Smaldino**,** 2000**).** Reverberation is explained as a sound caused by overlapping of multiple echoes. Reverberation in an unoccupied classroom should not exceed 0.7 second (Wilson, 2002). Reverberation in classrooms arises from sound being reflected off hard walls and high ceilings. Therefore, if the noise level is low the reverberation will also be low. A low SNR and low reverberation both improve the acoustics and the conduciveness of the classroom **(**Crandell & Smaldino**,** 2000**).** Wilson (2002) argued that when classrooms are being designed, it is important to consider the teaching activities that will occur inside the rooms during the course of a school day. Acoustical considerations must facilitate the different teaching methods employed.

The ideal classroom should be acoustically friendly for all learners with different abilities and for all teaching styles. Furthermore, classrooms should not only be acoustically effective when the learner has normal hearing and is sitting quietly on the mat close to the teacher. The classroom should also accommodate the hearing-impaired learner during group discussions, when there are high levels of noise (Wilson, 2002).

In South Africa, New Zealand and other countries, primary school learning in small groups is encouraged and more emphasis is put on incidental learning. Because of this approach, noise levels are probably higher in these classrooms than in some other countries where more traditional teaching methods are used. Again, in both South Africa and New Zealand, situations where primary school learners sit quietly and listen to their teacher for the whole day are discouraged. However, most classrooms in South African rural and farm schools are not structured to accommodate these changes in teaching styles (Wilson, 2002).

There are several options available to improve the listening, speaking, learning and teaching environment in a classroom, as discussed in the previous chapter; however, this study focuses on the dynamic sound field amplified system (DSAS).

2.7 IMPROVING CLASSROOM ACOUSTICS WHEN TEACHING EFAL

Nelson and Soli (2000) state that it is common to find a number of learners with mild hearing loss in most schools. These are the learners who need improved classroom acoustics to reduce the negative impact of auditory disorders on learning. They further explain that there are also a number of learners with normal hearing who experience difficulties in the classroom due to poor classroom acoustics, the level of noise, distance from the teacher and reverberation of sound.

In Foundation Phase classrooms teachers add their own soft furnishings, which help absorb noise (Wilson, 2002). Curtains, large rugs, empty cardboard egg trays as wall panels *(see figure 2.1)* and putting four tennis balls on metal legs of each chair in classrooms that do not have carpeted floors are cheap and common strategies that are used in the classrooms to absorb the noise (Pugh, Miura & Asahara, 2006).

Outside noise and activities like traffic, and learners in corridors or playing outdoors can make it difficult for a teacher in a junior class to get her learners' attention. This could be caused by what they see and hear. Therefore windows are the main culprits for letting sound from outside into the classroom. One way of reducing the outside noise is insulating the windows with the installation of sound-reducing glass, it is however extremely expensive (Brown, 2016). Another common way that is effective with reducing distraction is hanging curtains on the windows. The disadvantage of the curtain is the outside can still be heard inside the classroom.

Figure 2.1 Curtains hanged on the windows in a junior class

https://www.curtainsts reduce noise and distraction in a classroom

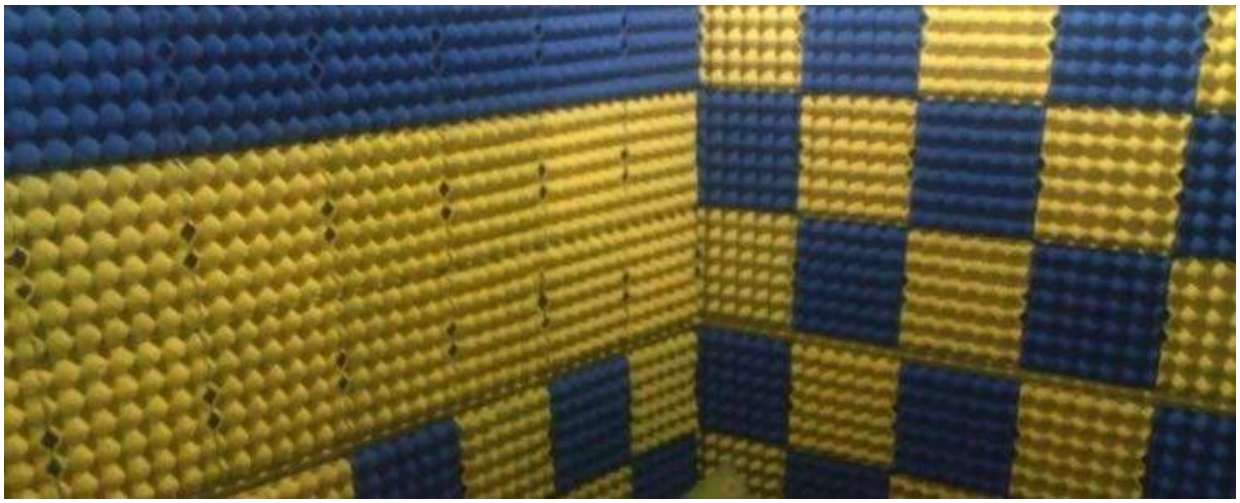

Figure 2.2: Cardboard egg trays on the wall

*www.acousticsfirst.com/**egg**c.htm*

There are many schools that use tennis balls as a means to reduce the background noise *(see picture 2.3 below).* However, health issues have been raised regarding the suitability of tennis balls as a noise deterrent. The Massachusetts Department of Public Health (2003) determined that as tennis balls are made with a rubber latex bladder, a large number of tennis balls being slid around on the legs of chairs can very probably be a health hazard in the form of latex dust, which is respiratory irritant (Pugh, Miura & Asahara, 2006).

The use of tennis balls on chair legs is more widespread in schools than the use of cardboard egg trays. Even though such trays are effective, the great concern that many teachers shared with me is that in case of fire these egg cardboard panels would make it difficult for the fire to be extinguished quickly. Therefore, they see these egg trays as being a fire hazard for learners.

Figure 2.3: Chairs fitted with tennis balls to reduce noise level (http://precuttennisballsforchairs.com).

2.8 THE IMPORTANCE OF IMPROVED ACOUSTICS IN LEARNING EFAL: BENEFITS TO TEACHERS AND LEARNERS

Anderson (2004) states that classrooms are busy places and can also be noisy environments. He mentions that learners are often expected to listen even in poor acoustic classrooms. Noise is a problem for everyone, but some students experience more difficulty than others. This includes Foundation Phase learners with temporary hearing loss from ear infections, learners with auditory processing, language or learning disabilities, and EFAL learners in the Foundation Phase whose levels of attention needs effort from the part of the teacher to arrest. Anderson (2004) argues that in spite of all the above-mentioned challenges, learners should be enabled to learn to listen in a sea of noise.

Soli and Sullivan (1997) explain that there are a number of learners with “normal hearing” who experience difficulties in a classroom where there is noise or reverberation. They explain that the ability to listen in a noisy environment is not developed until a child reaches adolescence. Overcrowded classrooms are often associated with rural villages and townships where lack of classrooms is a challenge. Teachers find it difficult to be audible enough to all learners in the classroom.

Ramma (2009) refers to research conducted on classroom acoustics, in three Johannesburg primary schools; seventy teachers participated in the study. The purpose of the study was to investigate primary school teachers' knowledge of and attitude to the impact of poor classroom acoustics. The study also examined the principals’ knowledge of how excessive background noise could be a barrier to learning. It is important for teachers to be well aware of this barrier. The findings of this study showed that the majority of the participants did not have in-depth knowledge of classroom acoustics and the negative impact of poor acoustics on both teachers and learners (Ramma, 2009).

2.8.1 The Mainstream Amplification Resource Room Study (MARRS)

The Mainstream Amplification Resource Room Study (MARRS) is a National Diffusion Network (NDN) project that uses DSAS to enhance oral instruction, to lessen teacher voice fatigue, and improve learners’ scholastic achievement

(Flexer, 1992). MARRS indicated that the original sound field amplification system research in Australia, New Zealand and the United States of America focused on learners with auditory and language learning challenges (Crandell, Smaldino & Flexer, 1995), and these authors advocated the expansion of research of the efficacy of DSAS in mainstream classrooms (Brace, 2006).

Rosenberg, Allen, Redmond, Phillip and Stigers (1995) argue that the use of an amplification device benefits all learners in the mainstream classrooms. The rationale to employ DSAS in the mainstream classes was informed by cases in the documented literature of high numbers of children with ear infections which were associated with hearing loss in the Foundation Phase. During the preschool and primary school years many learners suffer middle ear infection (otitis media) and mild hearing loss. Although this is a condition that occurs for a short while (Davis, 1986), it can create a huge backlog in the child's learning.

The MARRS study further indicated that learners with normal hearing ability showed a better ability to discriminate words more accurately with the use of a dynamic sound field amplification system than without (Arnold & Canning, 1999; Prendergast, 2005). There was evidence of improvement in dictated spelling tests from the same study, conducted in Australia, New Zealand and the United States of America (Crandell, Smaldino & Flexer, 1995). Learners in amplified classrooms performed better than those in an unamplified classroom (Dairi, 2000). Therefore my study concentrated on the use of the DSAS to improve noise levels and attention of learners in the classroom.

The MARRS study found that the use of the DSAS allowed the teachers to speak softly, without straining their voices, and still be heard more effectively by all learners in the classroom. The study was directed at learners with mild hearing loss and at both speakers and non-speakers of English (Sapienza, Crandell & Curtis, 1999; Mosheim, 2004).

2.8.2 Studies of the effect of an amplification system on learner performance

The better the children can hear, the more they can learn. For effective quality teaching and learning to take place it is crucial for the classroom acoustics to be

improved. The common challenge schools are faced with is that they have poor classroom acoustics, which raises the barriers to learning. The introduction of a DSAS is a very popular intervention strategy in Australia, New Zealand and the United States of America (Nienhuys, 1994; Mosheim, 2004).

Teachers consistently reported the positive effects on their vocal health when they used the DSAS. There was a great change, with fewer sore throats, less vocal strain and overall fatigue. They mentioned great benefits of the DSAS in their teaching. A few mentioned the positive effects while reading stories to learners (Millet, 2008). The use of sound field amplification is another way to ease stress on the learners and their teacher, because the background noise is suppressed (Gotaas & Starr, 1993). Teachers consistently reported the same positive effects on vocal health noted elsewhere in the literature (Shield & Dockrell, 2003). Several commented on fewer sore throats, stronger voices at the end of the week and generally less vocal strain and overall fatigue. They also noted benefits of the sound field systems to their teaching practices which went beyond simply providing them with stronger and healthier voices (Shield & Dockrell, 2003).

Teachers in Toronto, Canada teaching English as a second language to French speaking learners commented many times that the dynamic sound field system allowed them to reinforce morphological markers, auxiliary verbs and other difficult-to-hear aspects of English syntax and to provide a consistent, clear English model (Millet, 2008). As well as hearing a clearer English model from the teacher, the DSAS was also described as giving an opportunity for learners to hear their own and their peers' pronunciation (Millet, 2008).

DSAS can be used to assist learners to practise their own reading by listening to their amplified voices. One learner heard for the first time that his articulation of /r/ and /l/ was incorrect in EFAL, and was assisted by the teacher (Millet, 2008). This was significant in that the DSAS's projection of sounds and words in an unfamiliar language could be easily understood and emulated correctly (Millet, 2008).

Several teachers commented that they were able to be more dramatic and effective storytellers; they were able to vary their vocal intensity, intonation patterns, and vocal sound effects while reading a story, and learners were able to hear these subtle nuances (Gotaas & Starr, 1993). It is vital for the acoustics of the

classrooms to be improved by reducing the noise level. This will help learners in the Foundation Phase to hear the correct EFAL sounds. It will contribute to the process of developing their spoken language. The acquisition of EFAL is a priority for learners to gain access to study material, in their careers later in life and to compete in the global village.

2.9 THE DYNAMIC SOUND FIELD AMPLIFICATION SYSTEM

Brace (2006) explains DSAS as an educational device that amplifies the teacher's voice evenly throughout the classroom. Sound field amplification has also been termed classroom amplification and, more recently, dynamic sound field amplification (Flexer, 2002). It allows control of the acoustic environment in a classroom. Each learner can hear every word, regardless where they are sitting in the class. It benefits learners with hearing impairment, learners with hearing loss using hearing instruments and any other learner. Some learners become disengaged and disenfranchised in a case where the teacher is not audible. According to Rosenberg, Allen, Redmond, Phillips & Stigers (1995), the listening behaviour of learners improves.

This technology consists of a teacher-worn, small wireless microphone that transmits sound to a receiver system attached to one or more loudspeakers around the classroom (Millett, 2008). These speakers can be free standing or mounted to the wall or the ceiling (figure 2.3). For an average classroom, one loudspeaker is enough to overcome any background noise. The amplification allows the teacher's voice to be heard clearly above the background noise, at a volume that remains consistent throughout the classroom and throughout the day (Wolf, Bixby, Glenn & Gardner, 1991).

The DSAS was created to alleviate the issues mentioned above and to improve sound quality with clarity, not just amplification. It does this by distribution of voice with low-level amplification. In the case of additional support for students with hearing loss who use a personalised frequency modulation (FM) device, the sound field system enables access to several sound sources without having to juggle with connecting between devices.

The teacher's voice remains at a constant level, even if he/she turns away from the learners to write on the chalk/smart board (DiSarno, Schowalter & Grass, 2002). DSAS operates by amplifying the teacher's voice relative to the background noise; for example, if there is an aeroplane or a truck passing by, the teacher's voice will remain audible to the learners.

The ultimate goal of the DSAS is to amplify the teacher's voice by a few decibels and to provide uniform amplification throughout the classroom without making speech too loud for normal hearing children (Massie, Theodoros, McPherson & Smaldino, 2004). Although the DSAS was originally designed as an assistive technology for learners with mild hearing loss, research in the United States and Australia has shown that the DSAS benefits all children.

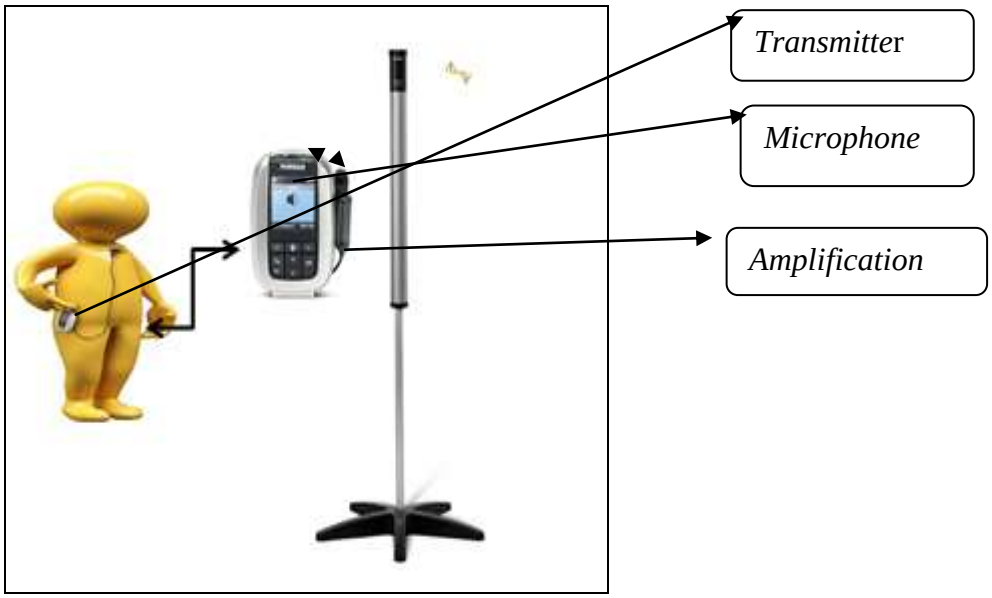

Figure 2.4: Dynamic sound field amplification system (Phonak, 2012). *(The figure shows the teacher in yellow wearing the wireless transmitter which is connected to the sound field amplification system)*

The main aim of classroom instruction is comprehension. For speech to be comprehended, the learner must be able to hear well in order to distinguish the sounds of individual phonemes (Massie, Theodoros, McPherson & Smaldino, 2004). Learners have shown a better ability to discriminate words and spoken language more accurately with the use of a DSAS. Learners benefited from a

DSAS in studies conducted with both English First Additional and native speakers of English. DSAS has been shown to produce improvements in speech perception. All learners experience poor phoneme discrimination abilities in a noisy classroom (Vincenty-Luyando, 2000).

2.10 STUDIES ON THE DSAS IMPLEMENTED IN MAINSTREAM SCHOOLS

There is a conspicuous absence of research studies on DSAS in the mainstream schools in the South African context. Most of the literature sourced reports on studies conducted internationally. However, while the international literature on DSAS focuses on learners with mild hearing loss (English speakers as well as non-English speakers), there are few studies where hearing learners with good cognitive abilities were included.

Rubin, Aquino-Russell and Flagg-Williams (2007) conducted a study of 60 New Brunswick mainstream classrooms in New Zealand, Grades 1 to 3 of the English First Additional Language speakers. 31 classrooms received DSASs and 29 classrooms served as control group. There were significant increases in learners' participation and responses to teachers' teaching and questions in the classrooms with DSAS.

There was a notable decrease in the number of teacher's repetitions, fewer learners were disruptive and initiated communications with peers during the teaching period, and learners were more attentive in the amplified classrooms. The teachers commented that the DSAS helped make classrooms more inclusive because all learners participated, and the passing around of the microphone not only increased the participation of the learners, it also increased their confidence and their assertiveness.

Teachers realised that the DSAS improved the learning process for learners experiencing specific learning barriers. Learners with autism, speech-language delays, central auditory processing disorders and sensory impairments also improved scholastically. They communicated and participated; as a result, their learning was improved. These learners were able to stay focussed, concentrated and were interested in the classroom activities (Rubin, Aquino-Russell, & Flagg-Williams, 2007).

There was a great decrease in special education referrals following installation of the DSASs in schools. This has been reported in several studies (Rubin, Aquino-Russell, & Flagg-Williams, 2007). Referrals to special schools may be due to many factors, but it is interesting that the referrals in the Oconto Falls School District in Wisconsin, dropped from an average of 7,72% in the years 1989-1998 to 4,6% from 1998 to 2000, when DSASs were installed in the classrooms (Flexer & Long, 2004).

The MARRS project indicated that special education referral rates fell almost by 40% after 5 years of DSAS use in classroom across the Wabash and Ohio school district (Ray, 1992). To date, the DSAS has been used for hearing impaired learners only and has not been considered for the mainstream classrooms (Flexer, 1992; Brace, 2006).

The reason for considering the DSAS is based on research findings of international research projects (Crandell & Smaldino, 1999; Nelson, 2000), which indicated that in the early grades, there are learners in all the mainstream classrooms who have a degree of hearing loss as well as normal hearing children who cannot process speech and language at the same time (Crandell & Smaldino, 1999).

Another DSAS study was conducted at an English primary school for hearing learners in New Zealand. Teachers had the DSAS in the classrooms for two months. The teachers reported a great improvement in the learner performance when using DSAS (Crandell & Smaldino, 1999).

Teachers reported that their own vocal strain was reduced. There was also less need to repeat information and instructions, and this may have contributed to the reduction in vocal strain. Most teachers' voice problems were found to be a major cause of teachers' absenteeism (MARRS Study, 2005).

The teachers reported that the classrooms were quieter, the DSAS was easy to use and the sound quality was excellent. The DSAS assisted with the class instruction; fewer discipline problems were recorded through improved voice control of learners. Teachers felt that learners were quieter in the classroom. A quieter classroom is the most important acoustical benefit from a DSAS, as less

noise in the classroom improves the signal-to-noise ratio (Flexer, 1992). Learners' improved hearing leads to improved understanding of the subject content. All teachers indicated that learner performance had improved (Flexer, 2002; Long, 2007). These results were indicative of high DSAS acceptance by the teachers.

The ability of a non-speaker of the language to comprehend spoken English in a noisy background is related to the listener's ability in and experience of the language (Crandell & Smaldino, 1999; Nelson, Kohnert, Sabur & Shaw, 2004). Often the English phonemic differences are subtle. The above-mentioned researchers gave an example of the two different English sounds, the 'b' and 'v', which are pronounced the same in Spanish (Millet, 2008).

This example illustrates the challenge that the Spanish learners will experience as English first additional learners. The study also shows how the use of the dynamic sound field amplification system improved the performance of the second-language learners dramatically.

'Slight hearing loss' is often interpreted as being of little or no consequence. This is not correct. It is important for all young learners to be able to hear sounds clearly (Nation & Newton, 2009; Tharpe & Bess, 1999), especially if the child's first additional language will be the language of teaching and learning when learners get to Grade 4, as is the case in some schools in South Africa.

The literature on the DSAS in the mainstream classrooms is minimal. Most literature is on learners with specific disabilities like hard of hearing and attention deficit disorders. Therefore there are no negative experiences of the utilisation of the DSAS in the literature. I am however certain that once the DSAS is withdrawn the negative effects will differ from one context to the other. The size of the classroom, the ages and the disabilities of the learners will also have an impact on the learners' performance.

There has not been any literature on the negatives of the DSAS and its affordability. For voice amplification, the teachers' correct pronunciation is important. I however wonder what happens when the DSAS are withdrawn; will it form any dependency on both the teachers and the learners? There are learners

whose hearing can be extremely sensitive, what if they are affected by the use of the DSAS? What happens if there are outside for learning activities?

2.10.1 Personalised FM System: Inside and outside the classroom

In a case of learners who are fitted with hearing aids the personalised FM unit can travel with the learner to all activities throughout the school day. (See figure 2.6 below). A learner fitted with hearing aids on the horse back, her coach having a personalised FM system that is linked to the learner's hearing aids. A personalised FM unit cuts through the distracting noises, to help a learner fitted with hearing aids to hear more clearly.

It enables a learner to follow the coach's instructions and participate maximally, both inside and outside the classroom (Beverly, 2012). The background noises can be profound more especially outside the classroom, it can be a real challenge for a learner to hear, understand and follow instructions. My study focused on hearing learners inside classroom.

Figure 2.5: Personalised FM System and a learner's hearing aids linked to it. **(Phonak, 2012).** *(The figure shows a red arrow, where the personalised FM system is, and the blue communication symbols between the coach's transmitter and the learner's hearing aids).*

2.11 CLASSROOM COMMUNICATION

According to the literature, classroom communication for the Aboriginal and Torres Strait Islander learner is a complex interaction of cultural influences, language mismatch and different learning preferences. Ineffective classroom participation can be a major barrier to effective classroom participation (Lowell, 1993). The challenges of noisy classrooms affect both teachers and learners.

- **Teachers**

The findings of the MARRS study that was conducted states that the Aboriginal and Torres Strait Islander teachers who are non-English speakers are faced with a challenge of bringing different expectations and interpretations to the classroom which may lead to misunderstandings (Kearins, 1985). Audibility alone does not solve the problem, because being a non English speaker as a teacher is important for your learners to get your sounds and pronunciations correct.

- **Learners' challenges**

Learners who are non-English speakers have difficulties and struggle with predicting or filling in the language gaps, particularly when hearing under adverse listening conditions and with hearing impairment (Burnip, 1994). This can affect learners emotionally and leave them feeling inadequate and incompetent in their school work (Sherwood & McConville, 1994). The Aboriginal and Torres Strait Islander learners are taught in an informal way and are less reliant on verbal interaction as the predominant medium of learning (Lowell, 1993; West, 1994). Their focus is more on peer interaction as a source of communication and learning. Learners naturally learn through observing their peers and being helped by peers (Howard, 1994).

South African young learners who are not native English speakers face the same problems as the Aboriginal and Torres Strait Islander learners. Even though learners are encouraged to interact in the learning environment, teachers as facilitators still play a vital role.

Classrooms after the installation of the DSAS

Two systems were installed at schools in Aboriginal and Torres Strait Islander communities in the Gulf of Carpentaria (Page et al., 1995).

The following benefits were extracted from teacher comments:

(i) Learners were less distracted;

(ii) it was easier to gain the children's attention;

(iii) no shame was associated with using the system for the whole class compared with devices for individuals; and children with normal hearing appeared to benefit as well.

The teachers also reported significantly less voice strain and fatigue at the end of the day. An improvement in listening behaviour during the six-month period was reported (Dowell, 1995).

The situation in the study mentioned is similar to the situation in South Africa. The common areas of concern in learning EFAL in South Africa are errors in distinguishing long and short syllables and high and low sound. For African and Afrikaans speakers learning English as a first additional language, the common examples are the long and short sounds of 'ship' and 'sheep' and the high and low sounds 'bed' and 'bird'. The teacher needs to be audible enough for sounds that are articulated correctly, used in context and are taught together with the different spelling to be distinguished (DBE, 2011).

A study was conducted in Brazil at a school of Communication Sciences and Disorders to examine whether the DSAS improved the speech perception abilities of learners with hearing loss in a classroom environment (De Souza, 2012). Many strategies, including personal hearing aids, environmental/teaching modifications and assistive listening devices have been used to assist hearing-impaired children in the classroom setting (Lewis, 1994). Audiologists have become concerned about learners who have minimal to mild hearing loss (not severe enough to warrant hearing aids), and the DSAS may offer a solution (Nienhuys, 1994; Northern & Downs, 2002). These learners are often treated as if they have normal hearing and must function in reverberant and noisy classrooms with little or no

assistance (Johnson & Stein, 1997). This is common in schools in the North West Province.

A few participants noted that DSAS was unnecessary (Rubin, Aquino-Russell & Flagg-Williams, 2007). They were not comfortable with the microphone touching their clothes or jewellery because of the distracting sounds that it made. It also amplifies sneezing or coughing. Another issue was that if teachers stood too close to a speaker, there was loud feedback. The other issue that was noted was that substitute teachers always had to be trained on how to use the DSAS. Da Cruz, Alves Silvério, Da Costa, Moret, Lauris and de Souza (2016) explain why it is essential to involve an audiologist after the installation of the DSAS. It is of paramount importance for audiologists to train teachers, learners and parents about the importance, proper use, cleaning and maintenance of DSAS. The correct maintenance of the technology will ensure full potential and benefits.

Da Cruz et al. (2016) agree with all other researchers that effective teaching and learning environments require optimum acoustic value to facilitate learning. They elaborate that there are three main considerations when evaluating how acoustic value is measured.

The three important aspects are:

- Speech intelligibility
- Hearing access
- Acoustic value

Each aspect has its unique impact on learning outcomes and they all differ, yet they are equally essential in realising optimum results.

Speech intelligibility is about understanding how to achieve the optimum speech clarity and precision in the learning environment that is critical in today's classrooms. Speech intelligibility adds value to both learning and teaching. It also provides reassurance to teachers, learners and parents about the learning environment. It enhances learning outcomes in an engaging and interactive way (Page, 1995; Da Cruz, et al., 2016).

Speech intelligibility means maintaining acoustic access to speech with a high degree of clarity in the presence of peripheral and background noise. Amplification together with clarity achieves speech intelligibility. DSAS raises the speaking voice over and above background noise. The researchers explained the difference between the Public Address Systems (PAS) and the DSAS. The PAS can only amplify all sounds, and this does not resolve the issue – it actually compounds it; this is also true of other computer and music sounds (Da Cruz, et al., 2016).

Hearing access refers to the addition of devices to support the needs of hearing-impaired learners. These devices include hearing aid induction and personalised FM and are intended for learners with hearing loss. The DSAS creates conducive environment for increased hearing access **(**Da Cruz, et al., 2016; Rosenberg & Blake-Rahter, 1995).

There are number of factors that prevent optimum hearing; for example: classroom size, external noise, distance between teacher and learners, overcrowded classrooms and poorly designed classroom acoustics.

Classroom size: The South African post-provisioning norms (2002) (Government Gazette 24077) indicate that the ideal maximum class size for Grades R–4 is 35. There is a greater opportunity for individual interaction between learners and teacher in a small class. Learners are able to hear and the teacher is audible (Great Schools Staff, 2015).

Classroom working noise: This is a noise from the classroom full of learners and a teacher working together. Teaching nowadays focuses on problem-solving and learners full participation. Learners are more interactive, working in groups and projects. Therefore most of this undesirable noise is likely to originate from human activities, i.e. chatter and laughter, taking out books, movement and noise from chairs and tables (Lundquist, 2003).

External or peripheral noise: Unlike internal noise, external noises are interfering sound stimulus occurring outside the classroom. External noises are difficult or impossible to control. They can be attributed to running vehicles, airplanes, lawn mowers and overhead projectors. External noises are all around. They overwhelm teachers and learners with their capacity to distract. The more a noise is capable

of distracting, the more it is considered an external noise (communication experiences, 2011).

The distance between teacher and learners: The distance between the teacher and learners in the classroom is very important for accurate receptive communication. The teacher should not be too far for the learners to struggle to hear her. The facts that young learners do not have the vocabulary and auditory closure skills the senior learners have; can be a disadvantage to the receptive language of the young learners. Thus the education of learners can be significantly undermined.

Overcrowded classrooms: It is important for the teacher learner ratio to be adhered to in the classrooms as stipulated in the norms and standard policy. From what I have observed as a district official this has not been implemented more especially in the rural schools. Overcrowded classrooms are stressful to teachers. Safety and health, minimal learner and teacher interaction, disruptive behaviours, teachers experienced emotional and psychological problems, increased workload and inadequate teaching time are serious concern (Muthusamy, 2015).

Poorly designed classroom acoustics: Previous studies have shown that primary-school-age learners perform worse in poor acoustic conditions. Experts say that while classroom chatter is unavoidable, many learners and teachers suffer because of badly designed classrooms that exacerbate the problem, or poorly insulated rooms that fail to block outside noises such as aircraft and traffic (Dugan, 2011).

Acoustic value refers to the ability of the classroom to soften and absorb sound. Optimum acoustic value includes classrooms and areas that diminish reverberation. The type of furniture, surfaces, doors, furnishing and windows, the whole structure reflects acoustic value. Improved acoustic value assists access to speech, but does not necessarily improve or impact upon speech intelligibility. For the teacher to be audible, more is needed than a classroom that can dampen reverberation, as hearing the teacher's echoing voice can also be a challenge to the hearing of the young learners (Da Cruz, et al., 2016).

Da Cruz et al. (2016) state that there is no need to retrofit buildings or to break down existing classroom infrastructure. Old protected heritage buildings can be easily outfitted with portable DSAS. In a case where the government or organisations are thinking of putting up new school structures, it would be wise to investigate all of the current systems so that the most suitable sound field technology is installed for maximum advantage.

A DSAS will be an advantage to teachers and learners. In the research, most schools had one microphone per class; however, having two is an advantage (some schools did). A second microphone offers numerous advantages in primary school environment. Learners learn to take turns, moving the microphone, sharing and learning to speak only when they have the microphone in their possession. Fewer inaudible, random or inappropriate comments or responses ensure that all learners will be attentive and able to participate.

The ideal teaching and learning environment is supposed to have treated acoustics for the teacher to be audible to all learners. However as much as DSAS is an essential device for all school, primary, special and big classes, and not expensive, the government has not realised the negative effect of the background noise in the classrooms.

2.12 STUDIES ON TEACHERS' AND LEARNERS' PERSPECTIVES ON THE IMPROVED ACOUSTICS

2.12.1 Enhanced learning

Teachers in all the above-mentioned studies stated that learners were more attentive. Most learners said that they were more focused because they could hear well. This improvement in concentration was seen by teachers to have a direct impact on the enhancement of learning. Most learners reported that they liked using the microphone and others reported that they were still becoming accustomed to it.

This was a benefit for learners with soft voices and those who were shy. It was felt that their confidence could be built up through greater participation. These learners were comfortable to speak more often since they were not being told to repeat themselves or to speak up because others could not hear them.

An improvement of the teachers' intelligibility was also recorded, as was a decrease in the teachers' vocal strain, especially where classes were large. Learners' participation also improved. This is a vital aspect of education and been shown to be connected to increased academic success and decreased learner dropout rates and the teachers were happy with the use of DSAS and the learners showing great progress in the learning of English as an additional language (Millett, 2008).

2.12.2 Inclusion of learners with special educational needs

Teachers found that the DSAS improved the learning process for students with different special educational needs. Benefits were noted for learners with autism, speech-language delays, central auditory processing disorders and sensory impairments. Their communication, and consequently their learning, was improved. They started participating more in classroom activities. It was also noted in one study that the number of special schools referrals and dropouts decreased drastically.

2.13 CRITICAL ANALYSIS OF STUDIES ON THE UTILISATION OF DSAS

There have not been enough studies on the DSAS nationally. Most studies were conducted in countries abroad. In the study that was conducted in South Africa, the teachers didn't show much interest in the utilisation of the DSAS (Ramma, 2009), and there has not been any noted follow-up on. The studies that were conducted abroad were specifically meant for learners with hearing loss; however, the researchers stated that hearing learners could also benefit from the utilisation of the DSAS.

The importance of using an appropriate data collection instrument in the research is emphasised (Babbie, 2013). Standardised instruments that are used by international researchers in Australia, New Zealand, the United States of America and other countries will not be necessarily be appropriate in South Africa, because the contexts are different.

Teachers interviewed in the studies stated the benefits of the DSAS and how their voices are not strained, because they do not have to raise their voices. In one study learners were also interviewed and expressed their satisfaction because the

teacher was more audible. In a case were the school had a roving microphone, shy and soft-spoken learners gained confidence (Rosenberg et al., 1999).

2.14 CONCLUSION

In this chapter the literature on the classroom acoustics was reviewed. The review confirms the challenges that exist in the EFAL Foundation Phase classes. The gap that is there in literature is the effect of acoustics on learning a new language in contexts where the new language is taught by the second language speaker and the first language users of the new language are absent. The correct pronunciation of the words in the new language are easily missed by learners and the teachers. Bad acoustics tend to affect how the new language is learned. This study therefore intends to document the use of DSAS a device meant to enhance the acoustics of a classroom in disadvantaged contexts in South Africa. The South African literature also indicates that there is limited research data about teachers' knowledge of classroom acoustics (Ramma, 2009).

Larsen and Blair (2008) argue that DSAS solves only part of the problem, as it only amplifies the teacher’s voice and not the classroom reverberation. This eases stress on the learners and their teacher by amplifying her voice.

DSAS is meant to enhance sounds in the classroom. It can be used for any teaching purpose and not necessarily for EFAL teaching only. Therefore the emphasis is not necessarily about language teaching and learning, but about enhancing the audibility of voices in the classroom. For the purpose of this study the focus is on EFAL.

The benefits of DSAS for improved hearing and listening for young learners and at-risk learners have long been known; however, the results of several studies suggest that there may be less tangible but equally important effects for all participants in the classroom community. The teachers in the studies were able to expand the possibilities of the DSAS to create better listening environments. However, the challenge will still exist when the learners want to ask or respond to questions in class (Gotaas & Starr, 1993). Therefore the DSAS does not necessarily solve the problem of reverberation (Nelson, Soli & Seltz 2002). In chapter three the theoretical framework of the study is considered.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.1 INTRODUCTION

The purpose of this chapter is to present the theoretical framework as the foundation of my research study, which provides “an overview of perspectives and research results with reference to your topic” (Ferreira, 2012: 34). It created the platform needed to plan the study using existing ideas and guided the documentation through the evaluation of teachers’ implementation of the DSAS as programme or project to provide an answer to the ‘why’ question (Walvoord & McCarthy, 2008:25). An extensive review of literature in Chapter two assisted with the conceptual framework of the dynamic sound field amplification system (DSAS) and acoustics.

The study conducted was about documenting the process of the implementation of the DSAS device in English First Additional Language classes. Theory of change was found to be appropriate in a study that predicts and expects changes as outcomes of the process of the implementation of the DSAS in an EFAL classroom. The aim of the study was not to evaluate the impact of the device, but instead it was a reflective journey of the process of the use of the DSAS. Assumptions were imperative in how the implementation would unfold, and this formed the core of the expectations on the outputs of the study.

Theory of change is a process oriented approach to analysing complex systems and for planning actions we think will manipulate parts of the system positively (van Es, Guijt & Vogel, 2015). This implies that a study using theory of action is not interested in evaluating the process but is interested in the process taken to achieve a goal. The results of a study using theory of action can be used to evaluate the project or programme since all the nitty gritties that are imperative in making the programme successful are indentified. Theory of action uses a logic frame to come to its conclusion, thus it takes a linear process, the same as the evaluation theory.

Some scholars use the theory of change and evaluation theories interchangeably (Mackinnon, Amott & McGarver, 2006) as they seem to be doing the same task. Theory of action is said to lay the foundation for “more consistent programme implementation.” It is said to be “confrontational in that it uncovers inconsistencies and contradictions between ‘the walk and talk” in that assumptions about the why and what of the programme are clarified. Theories of change are predecessors of evaluation processes. They are prone to predict the outcomes, indicators (hypothesis) and state the cause- effect relationship. Theory of change is closely related to theory of evaluation (van Es, Guijt & Vogel, 2015; page 15). Theory of change focuses on five steps promote, provide, produce, assess/evaluate and achieve (Evaluation Exchange, 2006). When describing each step I explain my application to the DSAS as programme.

- **Promote** is explained as to actively encourage. The study identified the need to put in action activities concerning the challenging classroom acoustics. Therefore treating classroom acoustics is actively encouraged.

- **Provide** is explained as to furnish, i.e. to provide the DSAS systems in the three classrooms.

- **Produce** is explained as to initiate, i.e. the introduction of the DSAS in the classrooms and the use thereof by the teachers.

- **Assess** is explained as to evaluate, i.e. assessing the use of the DSAS for teaching and learning.

- **Achieve** means to attain by effort, impact or effect, i.e. documenting their experinces of the improved acoustics (getting results) from the three teachers.

I am first going to explain 'evaluation', and the reasons for using it with my exploratory study and my methodology of documentation my investigation, as it is complementary to the theoretical framework for this study. However in this study the concept evaluation is used hand in hand with the documentation processes.

This is because in documenting it is not always easy to remove oneself from the process as one’s judgement of what is going on keeps on creeping on the

proceedings. Despite this I observed the ethical principles expounded at the beginning - that I will try to be as neutral as is possible.

My study is about documenting teachers' experiences when using the DSAS in EFAL classrooms in the North West Province.

This chapter reviews the components of programme theory evaluation (PTE) and how it interfaces with the theory of change are discussed below. The theory of change (ToC) is not about evaluating a programme, but it proclaims the desirability of change.

PTE (Chen, 1990) was chosen because of its useful application and its appropriateness for evaluating the DSAS in the three Grade 1 classes in the three schools. The theory of evaluation is going to be used to support the theory of change will be discussed. Then evaluation as theory of change is also discussed and the relevance thereof for my study is indicated.

3.2 CHEN'S PROGRAMME THEORY EVALUATION (PTE)

Theory-driven evaluation can be traced back to Tyler in the 1930s (Coryn, Noakes, Westine & Schröter, 2011). PTE is the crux of theory-driven evaluation, and it helps construct and use new innovations or programme as a guide in the evaluation process and progress. The theory is used for the process of developing a logical model and specifies what must be done to achieve the desired goals (Funnel & Rogers, 2011). It provides a foundation for evaluating complex processes, which are often difficult to evaluate. That is why it is referred to as theory of change.

3.2.1 Programme Theory of Change

The theory of change emerged from the programme theory of evaluation in the mid-1990s as a new approach for analysing the theories, motivating programmes and initiatives working for social and political change (James, 2011). The benefits of the theory of change depended on the purpose of the process, the approach took in the use of the DSAS. For the purpose of this study it was beneficial for the three schools as they had a common understanding of what was expected from them.

It was only possible for schools to have a common understanding after they were given a thorough explanation and the importance of the effectiveness and focus of programmes was emphasised.

Theory of Change is used mainly to guide the implementation of programmes. It leans mainly on evaluation and social change, thus it is used mainly by civil society and donors in ensuring that their programmes have positive effect where implemented (Vogel, 2012). Vogel (2012) further states that ToC unlike the evaluation theories focuses more on theoretical underpinnings of programmes and articulation and linkages between inputs and outcomes so that the information can be used for evaluation and improvement of programmes purposes. The purpose of my study is therefore to document the process of the implementation of the DSAS device in an EFAL classroom. The steps taken and conclusions arrived at will be used to evaluate the impact the programme has on learners ability to use English proficiently.

The use of the theory of change for clear communication to the three schools, the Department of Basic Education and as a reporting framework was important in the study. Lastly, the use of the theory of change empowered other teachers in the three schools and the departmental officials to appreciate the importance of classroom acoustics (James, 2011).

Programme theory evaluation (PTE) is a logic model; it shows a single linear causal path. It includes five variation categories – inputs, processes, outputs, outcomes and impacts (Chen, 1990). This linear programme theory model was employed to document the process of the study using the five components, with the focus on why PTE is appropriate for this study. The process of using programme theory evaluation is discussed for each component.

The practical approach with the components or steps of this model was deemed appropriate to document the use of the DSAS in the three schools. Programme theory evaluation models are applied to different programmes, often community health and improvement programmes.

It is a model that can be used throughout the life of the programme (W.K. Kellogg Foundation, 2004) and has been widely adopted for evaluating community change

projects (Chen, 1990). A programme theory consists of statements that describe a certain programme. The process explains why, how and under what conditions the programme effects occur.

It also predicts the outcomes of the programme and states the requirements necessary to bring about the desired programme effects (Sidani & Sechrest, 1999).

3.3 DEVELOPMENT OF PROGRAMME THEORY OF CHANGE

Programme Theory of Change was chosen because it provides a platform to document programmes that are relatively difficult to document (Chen, 1990). A programme theory clearly guides planners, staff members, people responsible for obtaining funding and researchers to do their task meticulously and enables them to give detailed financial and progress feedback to the funders and the service providers (Prosovac & Carey, 1997; Weiss, 1997). The detailed financial feedback encourages programme investors to focus on specific outcomes rather than wasting funding and resources (Prosovac & Carey, 1997; Rogers, 2000). ToC assisted and guided the researcher in process documentation of the DSAS utilisation in the three schools. Programme Theory of Change can also be used to develop outcomes and goals of the study (Sharpe, 2011).

The initial stage of developing the programme is the conceptual foundation. The next stage is that the programme theory will be implementation, the process and lastly developing the results and transitional goals. Prosovac and Carey (1997) explain that this process of planning stages increases the chance of programme success. Even though programme theories can be developed at any time during the operation of the programme (Rogers et al, 2000; Reynolds, 1998) or before process documentation (Bickman, 1987), it is always wise to develop a programme theory before the start of any program.

Conducting a study underpinned by a theory of theory was essential to document the process of the implementation of the DSAS. This informed teachers and district officials with valuable information that can be used to evaluate the project.

This will supply the North West Department of Education with the appropriate findings; they will be able to focus on specific outcomes and monitor if the use of the DSAS will be beneficial to learners in the mainstream. (Rogers, 2008). The North West Department of Education will also be in the position to determine the possibility of expanding the programme by purchasing DSAS for more schools.

3.4 CORE PRINCIPLES OF THEORY-DRIVEN CHANGE

Theory-driven theory has two important components. The first component is conceptual, the second one empirical (Rogers, 2000). Conceptually, theory-driven evaluations explained a programme theory. Chen (2005) differentiates four variants of theory-driven evaluation. These depend on which part of the conceptual framework of a programme theory the evaluation is focused on. The four variants of theory-driven evaluation are

(i) theory-driven process evaluation,

(ii) intervening mechanism evaluation,

(iii) moderating mechanism evaluation, and

(iv) integrative process/outcome evaluation.

The first three variants represented options for tailoring theory-driven evaluations so that they were focused only on one aspect, which was an element or chain of the programme theory. The last variant focused on the evaluation of results (Weiss, 1998).

3.5 USING PROGRAMME THEORY MODEL TO EFFECT DESIRED CHANGE

This study followed the model that was commissioned by the Kellogg Foundation in 1998 and 2000, the linear programme theory model (Coryn et al., 2011). The Programme Theory Evaluation model was employed to evaluate the community change projects in the United States of America. The model had three distinct stages.

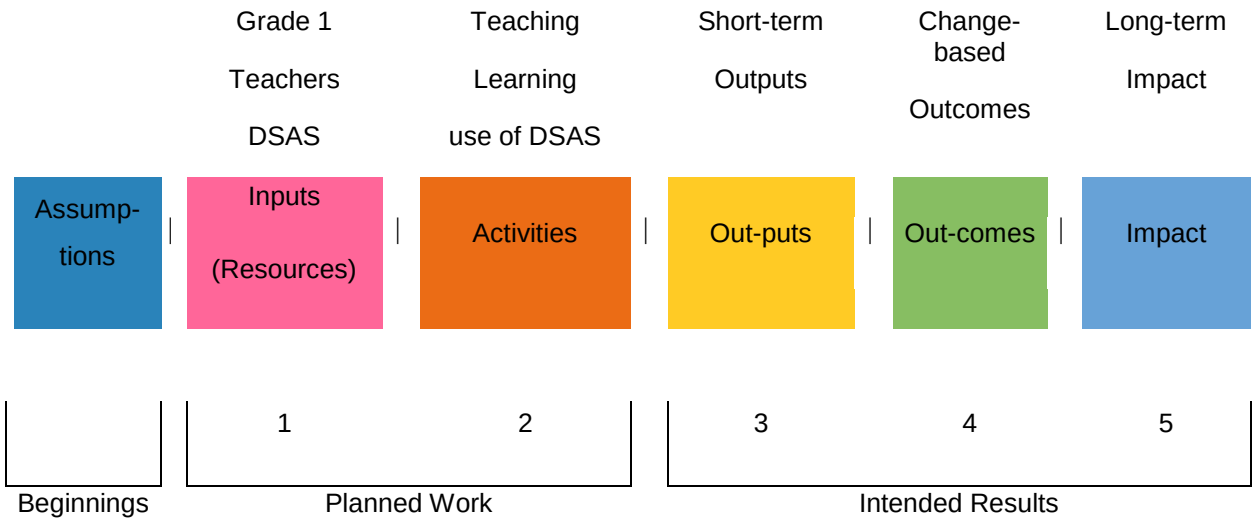

Diagram 3.1: Emerging single linear logic model and theory of change model (Rogers, 2008; Mulgan, Puttick, & Breakspear, 2014).

Diagram 3.1 illustrated the three stages. There was a preliminary stage (Beginnings) at which was gathered the assumptions for the study that guided the researcher and served as a reminder in the research process. This was followed by two procedural stages (Planned Work and Intended Results), within which there were five components.

Component 1: The inputs or resources were the three teachers, the Grade 1 classes of the three schools (sample for the study) and the dynamic sound field amplification systems provided in the classrooms.

Component 2: The activities included the utilisation of the dynamic sound field amplification systems and the teaching and learning of English First Additional Language.

Component 3: The short-term outputs of activities. Side- effects and patterns of change were specified. This covered how audible the teacher was to all learners in the classroom and also checked whether the learners were attentive.

Component 4: The change-based outcomes were benchmarked against the EFAL annual national assessment (ANA) results of the learners.

Component 5: Impact was long-term, with broad outcomes from components 1 to 4. This focused on the final expected outcome. Components one and two were the planned work; three to five were the intended outcome.

The logic model showed a single linear causal path. It was a cause-and-effect chain; one element leading to the next and ultimately to the intended goal. If there was a gap in the logic, it was of vital importance for the researcher to alter activities.

3.6 CRITICISMS OF AND RATIONALES FOR INCREASED USE OF THEORY-DRIVEN EVALUATION

Campbell (1984) does not agree that the programme theory of evaluation is ideal to design and evaluate social programmes, which are often watered down to be politically acceptable.

Since the theory-driven evaluation approach was accepted as a legitimate form of evaluation, it was the subject of both pleas for increased use and harsh criticism. Scriven and Stufflebeam have been the greatest critics of the approach. Scriven (1991) and Donald and Lipsey (2006) argued that one does not need to know anything about electronics to evaluate electronic devices and equipment and a theory is not needed. Stufflebeam and Shinkfield (2007) added that often the evaluator played a major role in developing the device that is evaluated: therefore the element of objectivity is absent because of an intrinsic conflict of interest in that theory-driven evaluation. Coryn (2009) also has raised concerns that most authors of theory-driven evaluation approaches only tell one what to do, but not how to do it. Coryn's argument is not relevant tor this study because the schools preferred to take the leading role in the utilisation of the DSAS. Therefore there was no need for them to be told exactly how to arrange their classrooms, which were already set up to suit the learners.

Chen (1994) explained the importance of the process to gather knowledge of how programme goals are attained. He says that there are instances where there is a need for the evaluations to be compared.

3.6.1 Comparative or non-comparative evaluation

Depending on the circumstances, an evaluation can be comparative or non-comparative. The important aspect to be considered is the nature of the potential beneficiaries and the evaluation information needed. If the beneficiaries need to choose a device or service, it is advisable for the evaluation to be comparative so as to assist the potential beneficiaries to learn about the available DSASs that are in the market. It is crucial for evaluations to be comparative before one purchases a device or service.

This can be a challenge in the case of some urban and most rural and farm schools, as they rely on the Department of Basic Education to purchase the equipment for them. More often than not the school does not have any input, as happened with the three schools in my study.

Intended results

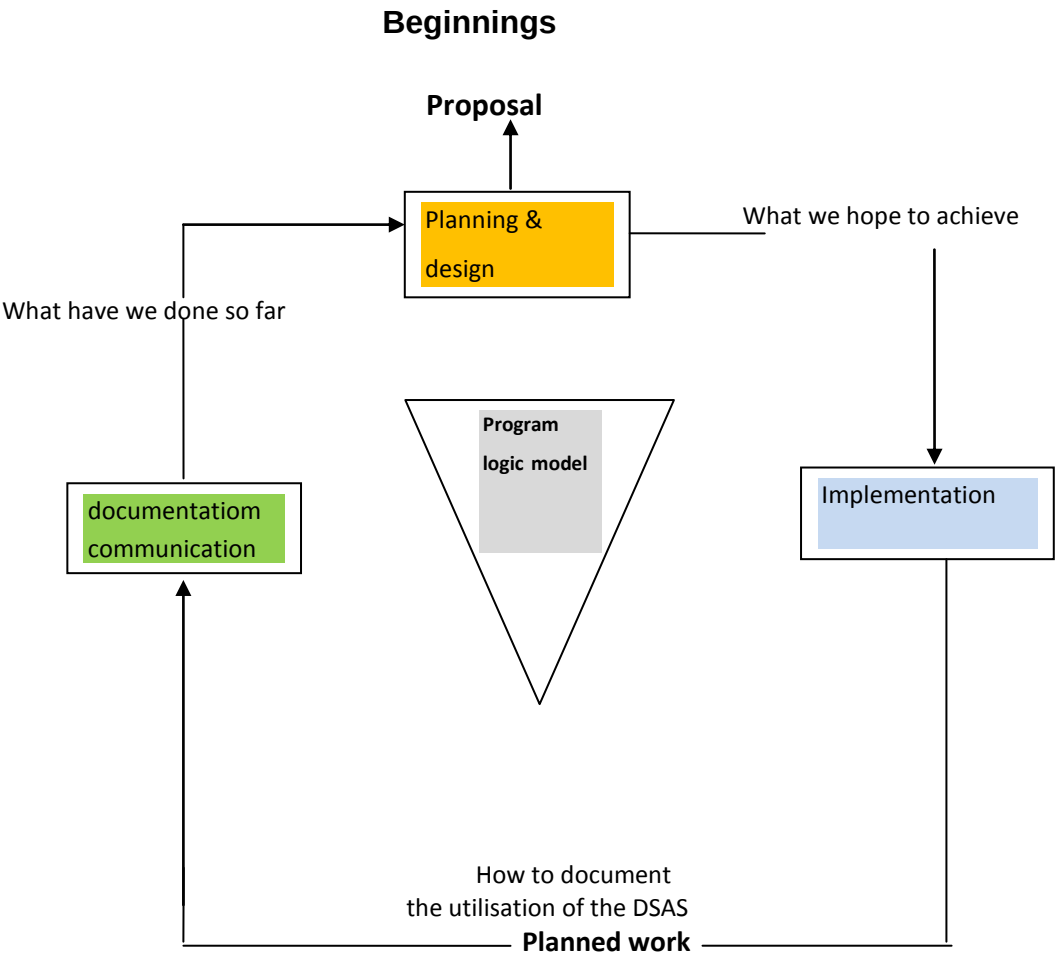

Diagram 3.2: Adapted Program Logic Model (Weiss ,1998)

Diagram 3.2 illustrates the process that my research followed and how the Theory Approach Model influenced the design and plan of my study. It was essential to follow the management plan for implementation. Teaching and learning activities were discussed with the teachers. I communicated with the Grade 1 teachers on the process of my study that was documenting teachers'experienced, observations and unstructured interviews. This model because it described the beginning of a program in detail was helpful during program planning and design (Weiss, 1998).

3.7 CONCLUSION

The explanation and critiques of the theory that underpins my study form the basis and foundation of my study. I adopt a premise that it is important for the utilisation of the DSAS to be evaluated in the 3 Grade 1 classes.

Programme theory of change has the potential to be of paramount importance to human rights, policy making and social betterment (Donaldson, 2007; Donaldson & Lipsey, 2006). In a case where the programme theory of change fails to achieve its intended outcomes or is ineffective, the researcher should be able to find out whether such failure can be attributed to wrong context or implementation failure (Cordray & Pion, 2006), or simply theory failure, thus requiring some adaptation (Rogers, 2000; Suchman, 1967). In a case where a programme theory of change is successful and effective, the approach should identify which elements are essential for future replication (Stufflebeam & Shinkfield, 2007).

The next chapter will outline the process and course the study will take. The research methodology is thoroughly explained. The procedures and processes outlining how data were dealt with will be highlighted in this chapter.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter describes the research methodology, the research site and the sampling approaches employed in the data collection. The study followed qualitative documentation by using evaluation to look at the teachers' experiences of the DSAS as programme or project to improve teaching and learning EFAL in the Foundation Phase. The chapter discusses the research methodology used to guide the study, the methods selected for data collection, analysis and research quality aspects. It explains the techniques the researcher employed during the sampling, data collection, data documentation and data analysis processes (Ferreira, 2012). In conclusion, the chapter focuses on the ethical procedures and the role of the researcher.

Below is a summary of my research methodology

Table 4.1: Summary of the research methodology (adapted from Adebanji, 2010)

RESEARCH METHODOLOGY	
Paradigmatic consideration	Summative qualitative evaluation research approach
RESEARCH PROCESS THROUGH DOCUMENTATION	
Selection of Participants	
Purposeful sampling	Selection of 3 Foundation Phase teachers who use the DSAS, class assistant, 130 learners in their three classes, 2 principals, 1 head of department in the same schools and the 2 speech language pathologist and audiologists in the North West Province.

Role of the Researcher	
Data Collection	
Data collection methods	Observation, semi-structured interviews and researcher's observation, journal, photos and field notes
RESEARCH QUESTIONS	
Main research question:	1. What are the teachers' experiences when using DSAS, teaching EFAL in the Foundation Phase?
Research subquestions:	1. How can DSAS improve acoustics in the teaching and learning of EFAL in the Foundation Phase? 1 How do teachers make use of the dynamic sound field amplification system in teaching EFAL in the Foundation Phase? 2. How do learners respond to the use of the dynamic sound field amplification system when learning EFAL? 3. What are the outcomes of utilising the dynamic sound field amplification system in the teaching and learning of EFAL in a mainstream Foundation Phase classroom?
Data Analysis and Interpretation	
Content analysis: coding and document analysis	
Quality Criteria of the Research	
Dependability, credibility, transferability and confirmability	

4.2 RESEARCH PARADIGM

Mason (2002:2) describes qualitative evaluative research that allows the researcher to get an “insider perspective on social action”. According to Mouton (2012), the research design focuses on the study plan that will be followed. It is about how the study should be conducted (Babbie & Mouton, 2001). Mouton (2012) further explains that a research design is “a blueprint of how you intend to conduct the research”.

The purpose of the research design is to guide the researcher to provide credible results (Fouché & Schurink, 2012). Credible results can only be achieved if the following steps are followed:

(i) clients need to be involved,

(ii) access to and cooperation with the school must be obtained,

(iii) it is important to know the concerns of the school,

(iv) collaboration with the Grade 1 teachers is needed to analyse problems and

(v) realistic goals and objectives must be agreed with the schools (De Vos & Strydom,2012).

This study seeks to document by exploring the experiences of teachers and learners of the implementation and use of the DSAS in three primary schools in the North West Province. Marlow (2005:334) defines exploratory research as follows: “A form of research that generates initial insights into the nature of an issue and develops questions to be investigated by more extensive studies”.

In order to achieve credible results, I needed to employ a research paradigm that guided the study. Within qualitative research there are different paradigms (Maree, 2011). The appropriate paradigm for this study is exploratory. It is of vital importance to commit to a certain form of ontology and epistemology paradigms in the study. This study followed the exploratory epistemological paradigm. The exploratory epistemology paradigm seeks to describe, understand and interpret (Maree, 2011). It allowed me to be open-minded and flexible when I documented

the use of the dynamic sound field amplification system (DSAS). The goal of the exploratory paradigm in the study is to understand and explore how the DSAS dealt with the background noise level of the classroom. According to Babbie (2008), the strength of the exploratory paradigm is that it allows the researcher to collect rich data from the participants. This approach is cost effective because it permits the researcher to use few resources that generates rich data.

4.3 RESEARCH METHODOLOGY

This qualitative study followed the documentation process of the experiences of teachers and learners in using the DSAS. The approach was appropriate for my research question, as I documented the utilisation of the use of the dynamic sound field amplification system (DSAS) as a programme in the Grade 1 EFAL teaching (Mouton, 2012).

The documentation entailed gathering, ordering and making careful judgments about information and examining the worth, significance and meaning of the phenomenon. In documentation despite the fact that evaluation is not a focus- however the two have a tendency of encroaching onto one another. Docementation too has an element of reflectivity in that ones views about what is documented is a reality. Weiss (1998) explains that although programme planning, monitoring and evaluation are crucial, one should always remember the importance of what the programme expects to achieve. This was done in a methodical way. Planning and conducting this study followed a scientific evaluation research process (Schrunik, Fouché & De Vos, 2012) to acquire a deeper perception (Fouché, 2012).

Table 4.2 illustrates the process of the evaluation

(i) Type of evaluation:

The emphasis in this programme was information for looking at outcomes.

(ii) Purpose of evaluation:

(a) Needs assessment, which discussed the challenges that they experienced with background noise in the classrooms.

(b) Determining the outcome of the utilisation of the DSAS. Evaluation and efficiency of implementation were key to my research. This assisted me to see the impact that the DSAS had on teachers; teaching and Grade 1 learners' learning in the three schools.

(iii) The evaluation looked at the ways in which ingredients were put together to answer the evaluation questions and at how and when the information was collected.

(iv) The approach used to conduct a qualitative study.

(v) Lastly, the life cycle focused on the time frame of the programme (Fouché, 2012).

Table 4.2: Adapted model of the research process by using evaluation (Fouché, 2012)

Evaluation approach	**Evaluation** of DSAS as **programme**	**Strengths**	**Challenges**
(i) Type of evaluation	(Information for documenting outcomes, to evaluate the impact of the DSAS).	The process was cost effective, and efficient. The essential information needed to document the teachers' experiences during the utilisation of the DSAS was collected.	Even though the process was cost effective, and the budget was set aside for the study, under some unforeseen circumstances I had financial shortage.

Evaluation approach	**Evaluation** of DSAS as **programme**			**Strengths**	**Challenges**
(ii) Purpose of evaluation	a. Discussions to determine challenges **(**Needs assess-ments)	b. To monitor the impact of the DSAS.	c. Outcome of the utilisation of the DSAS	The participation of the teachers and learners was key in the process as it assisted me to see the impact of the DSAS.	As a deputy chief education specialist (DCES) and working in the same schools in the North West Department of Education, I continuously needed to remind teachers that I was there as a researcher not as an official.
(iii) Role of **evaluation** in **designs**	• Ways in which ingredients were put together to respond to the evaluation questions. • What was documented? • How information was collected? *(this included data collection methods and tools, i.e., semi-structured interviews and classroom observations)* • When was information collected? • Who provided information?			Responding to the questions, it was important to document the utilisation of the DSAS. This was done by gathering data from the participants and observation.	
(iv) Evaluation methods	Approaches used to conduct a qualitative study through documentation. (Semi-structured interviews and classroom observations)			For the purpose of this study the qualitative research was employed.	It is often difficult to be objective when documenting the teachers' experiences and the classroom observation
(v) Life cycle	**Beginning → Middle → End**			It was important for me to have the	It was not easy to keep to the life cycle

Evaluation approach	**Evaluation** of DSAS as **programme**	**Strengths**	**Challenges**
		life cycle for the study, to monitor the process.	of the project.

4.3.1 Research questions

The research questions guiding this study are discussed below. These are in line with the research methodology and they will help understand the whole processes of the research study.The research questions are essential to understand the chosen research methodologies and the process of the study. Research questions form the basis of where you are going. They are of paramount importance in understanding the complexity of the study and all the other factors that affect the research study.

Research questions inform the methodologies and are the ground beneath the foundation. If your foundation is built on sand, your study will involve constant correction of that initial issue instead of on making an inspiring research project (Kowalczyk, 2015).

The research questions were informed by the aim of the study, which was to evaluate how improved acoustics can optimise English First Additional Language (EFAL) teaching and learning in the Foundation Phase. The study also documented the use of the DSAS in three Grade 1 mainstream classrooms in North West for teaching EFAL. This was done by discussing the teachers' challenges as regards to the acoustics in their classrooms.

The classroom observations afforded me the opportunity to see how the learners reacted in the improved acoustic classroom. Lastly, the discussions with the teachers enabled me to hear how they felt about the optimal utilisation of the DSAS.

The process of collecting data at the three schools was clearly stated for this study and was shared with the management of the North West Department of Basic Education as stipulated. They will be in the position to study the results and assist schools accordingly. These research questions were individually tackled and linked to the methodology employed for data collection.

Table 4.3: Research questions

RESEARCH QUESTIONS	**METHODOLOGY**	**PURPOSE**
Main research question: What are the teachers' experiences when using DSAS, teaching EFAL in the Foundation Phase?	Semi-structured interviews with − Grade 1 teachers − Grade 1 learners − Principals / HOD Grade 1 classroom observation	To get the views of – Grade 1 teachers – Grade 1 learners – Principals / HOD on the utilisation of the DSAS
Research sub-questions: How can DSAS improve acoustics in the teaching and learning of EFAL in the Foundation Phase?	Semi-structured interviews and observation	To get the teachers' perspective on the challenges that they are experiencing teaching EFAL
How do teachers make use of the dynamic sound field amplification system in teaching EFAL in the Foundation Phase?	Semi-structured interviews and observation	To understand how the teachers use the DSAS in the Grade 1 classrooms to benefit the learners when they are taught EFAL

RESEARCH QUESTIONS	METHODOLOGY	PURPOSE
How do learners respond to the use of the dynamic sound field amplification system when learning EFAL?	Semi-structured interviews and observation	To get the learners' feedback on the learning of EFAL where the DSAS is utilised
What are the outcomes of utilising the dynamic sound field amplification system in the teaching and learning of EFAL in a mainstream Foundation Phase classroom?	Semi-structured interviews and observation	To get the general outcomes on the use of the DSAS in the Foundation Phase mainstream classrooms

4.4 SAMPLING

This research followed a non-probability, purposive sampling technique. One school was a former model C, the second a former farm school and the last one a rural school. The selection was done according to the geographic location, bearing in mind the diversity of the South African population, i.e. different racial groups and socio-economic background; this enriched the data and enhanced the credibility of the findings.

4.4.1 Selection of participants

The following criteria were used to select participants:

- Three Grade 1 EFAL teachers who are English second language speakers.
- Grade 1 learners in the same classrooms as the teachers selected. They too must be English second language speakers.

Provincial education departments gauge the poverty levels of schools; the community around the schools (more specifically: income levels) is taken into

consideration. Schools are then classified into quintiles. Quintile 1 schools are often the rural and farm schools.

They get a larger budget allocation and charge no fees. In Quintile 3, the schools' budget allocation is less than that of schools in Quintile 1. In Quintile 5, the schools get a smaller subsidy and the parents pay schools fees. They do not get a national school nutrition programme (NSNP) budget allocation like the Quintiles 1, 2 and 3. However, even though a school can be in an affluent area, there are some families around the school that are unemployed. These are the parents who are exempted from the payment of school fees (Department of Education, 2004). It has been my observation that parents can only be exempted from payment of school fees when they submit evidence in support of their request, such as proof of lack of income.

The three schools in three different socio-economic backgrounds were chosen as sites for the research. Makgona is a quintile 1 school, Mooi is a quintile 3 school and Swallows is a quintile 5 school.

The three schools were chosen out of the few schools that have been supplied with the DSAS by the Department of Education. All three schools are mainstream schools. The school structures are made of bricks and mortar. In all three schools, the average age of learners was six years turning seven in the course of the year in Grade 1.

Two schools introduced EFAL as stipulated by CAPS in 2011. The other school was included because even though English is a language of learning and teaching, none of the learners and teachers is an English speaker. The selection of samples depended on the purpose of my study. Three Grade 1 classes with different abilities from three different schools in the same district were selected. All three Grade 1 classes had DSAS in their classrooms.

For the purpose of the study, pseudonyms were used.

4.4.2 Context of the schools

4.4.2.1 Makgona Primary School

Makgona, is located in a rural village .The home language of all learners and teachers is Setswana. The principal is a Setswana speaking female . In my research it is the only school that is a non-fee-paying school. The Grade 1 teacher had 63 learners in the classroom, 32 boys and 31 girls. Two boys have been diagnosed with mild hearing loss. The school governing body has appointed a class assistant for the Grade 1 class, as a vacant post was not filled. The high number of learners was unusual for a Grade 1 class.

Communities around this school come from a low socio-economic background; children are mostly cared for by grandmothers and single mothers and they survive on social grants. The school receives the NSNP for all learners. The caregivers and mothers are involved in the education of their children. Every Friday mothers and caregivers come to school to clean the classrooms.

In addition to the DSAS that the school has, there are curtains to assist with noise reduction. The teacher has access to the projector from the administration assistant whenever she needs it for her lessons. From Grades R to 3, the language of learning and teaching is Setswana; in Grades 4 to 7, the language of learning and teaching is English. The village where school is located have limited English exposure; the learners do not hear English anywhere else except in the classroom during the English period, where the only source of the language is the teacher.

4.4.2.2 Swallows Primary School

Swallows is a former Model C school which is situated in town. The majority of learners are Afrikaans, only a few are Setswana speakers and all teachers in the school are Afrikaans speakers. The language of learning and teaching is Afrikaans. English First Additional Language was introduced in Grade 1 in 2012. The head of department is a female teacher. The Grade 1 had 31 learners in the classroom, 13 boys and 18 girls. One boy and one girl were diagnosed with Attention Deficit Disorder (ADD), and they were on medication. Swallows Primary

accommodates learners with physical and learning disabilities, as all schools are expected to implement the Inclusive Education Policy (DBE, 2001).

The community around this school is from the high socio-economic background. The parents are involved in their children's education and sporting activities.They also serve needy learners with breakfast and lunch from Monday to Friday. The school does not receive the NSNP budget allocation from the government because it is a Quintile 5 school.

In addition to the DSAS that the school has, the classroom has desk dividers to assist learners to concentrate on their work, there are curtains to assist with noise reduction and the classroom has an interactive whiteboard.

4.4.2.3 Mooi Primary School

Mooi is a former farm school. The community around the school is employed. . All learners are Setswana speakers and all teachers are Afrikaans speakers, except one teacher whose home language is Setswana. The principal is an Afrikaans speaking male. The Grade 1 teacher is Afrikaans speaking. She has 36 learners in the classroom, 14 boys and 22 girls. Two of the boys have been identified with learning disabilities. The language of teaching and learning is English from Grade 1 to 7. The Grade R class is privately owned, which is a disadvantage to the parents, because the fees are higher. The majority of parents can afford to pay school fees; very few are exempted from paying school fees. The school does not receive the NSNP budget allocation, even though the HOD mentioned that they have requested for their school to be considered. The parents have the responsibility to prepare nutritious lunch boxes for their children.

The school has an enrichment centre to support learners experiencing learning problems. The parents are fully involved in the education of their children; they participate in the fundraising and sports activities. Like Makgona and Swallows schools, Mooi also has the DSAS in the Grade 1 class, the classroom has desk dividers to assist learners to concentrate in their work; they also have curtains to assist with noise reduction and an interactive whiteboard.

Table 4.4: Composition of research sites

Makgona School	**Mooi School**	**Swallows Schools**
Setswana-speaking female principal	Afrikaans-speaking male principal	Afrikaans-speaking female teacher (head of department)
Setswana-speaking teacher	Afrikaans-speaking teacher	Afrikaans-speaking teacher
Boys: 32 Girls: 31	Boys: 14 Girls: 22	Boys: 13 Girls: 18
All learners Setswana-speaking. *Language of learning and teaching is Setswana*.	*All learners Setswana-speaking.* *Language of learning and teaching is English.*	*3 boys and 2 girls Setswana-speaking.* *Language of learning and teaching is Afrikaans*.
Learners identified with mild hearing loss/or other learning disabilities:		
2 boys with mild hearing loss.	2 boys with learning disabilities.	1 boy and 1 girl with Attention Deficit Disorder, both on medication.
Equipment / assistive support in the classrooms:		
DSAS, curtains, projector on request.	DSAS, curtains, interactive white board, desk dividers.	DSAS, curtains, interactive white board, desk dividers.

The teachers in all three classrooms in which the studies were conducted had more than ten years' teaching experience in Grade 1 class. These teachers were selected on the basis of that experience.

4.5 DATA COLLECTION METHOD

Data collection and documentation is an important stage of the research. It is gaining access to the subjects of research; without them one cannot have credible data (Seabi, 2012). Denzin and Lincoln (2005) describe qualitative research as a

naturalistic enquiry, because data was collected in the participants' natural environment (Makgona, Mooi and Swallows primary schools). Data was collected through interviews, a reflective journal, field notes, photos and observation (McMillan and Schumacher, 2006). Interviews were conducted with the two principals, the Foundation Phase head of department (HOD), the Grade 1 learners and their teachers.

4.5.1 Observation

Observation is an organised process of collecting data that relies on my ability to gather data without questioning the participants (Seabi, 2012). Observation is subjective and structured. Reports on the observations were kept in the form of field notes (Greeff, 2012). It was important to record what I saw (non-verbal expressions of feelings) and what I heard (Silverman, 2000). A tape recorder was used. Each of the three schools had observations six times during the EFAL period (table 4.3). Photos were taken of the classroom settings to show the three different learning environments.

4.5.2 Semi-structured interviews

Seabi (2012) explains that a semi-structured interview is neither fully fixed nor fully free, but flexible. Denzin and Lincoln (2005) state that an interview is the art of asking questions and listening actively to the answers. Semi-structured interviews were conducted with the three Grade 1 teachers, the learners, the two principals and one HOD, and a conversational interviewing style consisting of open-ended questions was adopted (Seabi, 2012).

4.5.3 Field notes and journal

I kept a reflective journal and my field notes. Field notes included how Grade 1 teachers and learners behaved and reacted, their conversations and physical gestures (Louw (2009). I needed to separate my objective observations from my interpretations (Seabi, 2012). The reflective journal ensured that my personal bias and opinions were not reflected during data analysis and interpretation. I created my personal shorthand conventions, that is, abbreviation of concepts that I used in my notes.

In conclusion, I was careful not to disrupt normal activities of the schools (Kawulich, 2005). Observations, interviews and the reflective journal assisted me to arrive at an in-depth understanding of my study. The recorded discussions were transcribed immediately after recording, while they were still fresh in my mind (Greeff, 2012). The same was done with the detailed field notes from the reflective journal and observations (Bokaba, 2011). The process also helped me to identify challenges on an ongoing basis. I kept in mind that often a behaviour observed can be unusual or atypical, and this can be a threat to my study (Strydom, 2012). This was limited by the fact that I went to the schools before to explain what should be expected and the purpose of the study.

Table 4.5: The data collection process

Process	**Data collection strategy**	**Objective**
Administration	1. Ethical clearance	Obtained permission to conduct research
	2. Contacted participants	Built relationship with schools
	3. Correspondence with school governing bodies, parents and schools 4. Visited the three schools	Explained the purpose of the study and what to expect
1	Observation	Completed the task
	Semi-structured interviews	Completed the task
2	Analysis	Gathered data Interpreted data
3	Follow-up fieldwork	Gathered data Interpreted data

4.6 DATA ANALYSIS AND INTERPRETATION

Data analysis is a process of giving structure, order and meaning to collected data (Marshall and Rossman, 1995). The data analysis was guided by the literature on evaluation approach strategies. The process ran concurrently with data collecting. Data analysis started immediately when information from the interviews and observations had been collected. Data collected was immediately transcribed to get a clear understanding of the information gathered. The information assisted with the understanding of the Grade 1 learners and their teachers' experiences of the utilisation of the DSAS.

Observation data collected, information of field notes, photographs and semi-structured interview data was scrutinised, analysed and interpreted in order to discover emerging themes from the study (Mayring, 2000). The documenting of the utilisation of the DSAS and the classroom observation, field notes taken and transcribed interviews are all part of content analyses (Mayring, 2000).

This data was aligned to the information gathered from observations and interviews. The interview data from the 2 school principals, 1 HOD, 3 teachers, 1 class assistant, 2 speech language therapists and audiologists and learners in the 3 classrooms was transcribed and follow-up questions were posed in informal interviews to get clarity. The data collected was analysed and tallied with the research questions to show that the data was generated to speak to the questions. Documents informed by the research questions were studied and tallied with the responses gathered. The information gathered formed the basis for the interpretation of data collected. Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning to the study. Analysing documents includes coding content into themes similar to how interview transcripts are analysed (Administration Methods, 2010). Document analysis was also part of the data analysis in my study. This helped me to extract meaning from the transcribed interviews, field notes and the observation journal.

4.7 QUALITY CRITERIA OF THE RESEARCH

4.7.1 Trustworthiness

Trustworthiness is an integral aspect of qualitative research (Nieuwenhuis, 2007). Di Fabio and Maree (2012) refer to trustworthiness as the approach followed to collect and analyse data. In qualitative studies, the trustworthiness of research is enhanced by reliability and validity.

The quality principles into account in this study are listed below.

Table 4.6: Trustworthiness of the study

Trustworthiness	Strategies used to ensure quality of the study
Credibility	• Defended claims and explanations by comparing the research with the existing studies • Made use of member checking (Seale, 1999)
Confirmability	• Provided an audit trail that informed a clear and detailed account of the research process that was followed (Seale, 1999). • Made use of member checking (Seale, 1999)
Transferability	• Presented a thorough description of the research (Lincoln & Guba, 2002) that will help the reader to compare the research with other similar cases (Janesick, 2000)
Dependability	• Provided an audit trail that will give a clear and detailed account of the research process that was followed (Seale, 1999)

Reliability and validity can be a concern when observing participants. Observations are often subjective (Strydom, 2012). Given the interest I have in my professional work as an Inclusive Education official and the fact that I initiated the

DSAS project, I took care to ensure that my findings were not influenced by that, as it could have cast doubt on the trustworthiness of the study.

Trustworthiness improves the thoroughness of qualitative research (Macmillan & Schumacher, 2001). Therefore it was of paramount importance to use a tape recorder and journal on an ongoing basis for reflection. Furthermore, I needed to do member checking and ongoing interpretation of the data (Seale, 1999).

In order to ensure the trustworthiness of my research findings, I chose three research sites, because the use of multiple data collection methods allows for data triangulation, which increased the trustworthiness of my findings (Nieuwenhuis, 2007). According to Lincoln and Guba (1986), credibility, transferability, dependability and confirmability are important criteria of trustworthiness. The criteria are discussed further below.

4.7.2 Credibility

Credibility is about the positive approach to a study (Solomons, 2009). Bogdan and Biklen (1982) define credibility as the positive approach of collecting the data and recording it. The manner in which the researcher portrays the participants' viewpoints is key to the credibility of the study (Mertens, 2005) According to Ebersöhn, Eloff and Ferreira (2007), a participant's check should be carried out once conclusions have been established in order to ensure integrity of the data collected. Member checks were done to verify respondents' answers. Furthermore, during interviews, I repeated the participants' responses to them in order to ensure that their views were correctly interpreted and captured. Questions were simple and short; they were repeated whenever requested or there was a misunderstanding, especially in the case of the Grade 1 learners. After I had analysed the data, I sat with the participants to check with them if there was anything that I might have left out.

4.7.3 Transferability

Transferability serves as external validity for qualitative research; the researcher is expected to give a detailed description so that the readers can see whether the study applies to their situation. Transferability is the extent to which a study can

predict similar occurrences or can be broadly applied in a more general manner (Mertens, 2005, Fade 2003).

4.7.4 Dependability

Dependability refers to all of the research. The process should be appropriate and of high quality. Even though strategies or focus may change as the study continues, there should be consistency and reliability (Mertens, 2005).

The participants should have the comfort to know that if the same study was repeated in a similar way using the same participants in similar circumstances, the result and the findings would be same (Shenton, 2004).

I used simple language that was understood by all participants in the study. Data was also triangulated to increase the reliability of the study (Maree, 2007).

4.7.5 Confirmability

Confirmability refers to how objective the researcher has been in the research process. A detailed report of the process will improve objectivity as well as keep the researcher aware of their own personal bias (Ebersöhn et al., 2007). This will reduce the influence of the researcher's judgment.

A confirmability audit, that is going back and checking the original sources in transcripts, documents, journals and field notes, will assist in this process (Mertens, 2005). The use of a journal assisted me to continuously reflect on my personal feelings, values and beliefs about the topic under my study. My research also strongly linked my work to other studies.

4.8 ETHICAL CONSIDERATIONS OF THE RESEARCH

> *Ethics deals with beliefs about what is right or wrong, proper or improper, good or bad (McMillan & Schumacher, 2006). The importance of ethical aspects must be acknowledged (Ferreira, 2012). Ethics is vital for improving the quality of research. Ethics can be seen as the study of good conduct and of the grounds for making judgements about what is good conduct (Trusted, 1987).*

Table 4.7: Ethical considerations and related strategies (Ferreira, 2012)

Ethical consideration	Proposed strategies to enhance ethical conduct
Confidentiality	It was explained to the Department of Education, the District and Area Office, school management teams, the Grade 1 teachers and the parents that information would be kept confidential at all times and would only be used for the research purpose.
Anonymity	Babbie & Mouton (2001) state that is important to protect the participants' identity. Pseudonyms were used to protect the participants' identities in this study. The participants' information was depersonalised, and anonymity was discussed and maintained throughout the research.
Right of privacy	Detailed information on the importance of conducting interviews in a private place and the safe keeping of data was thoroughly discussed with the three schools (Elias & Theron, 2012).
Voluntary participation	The Grade 1 teachers were requested to participate in the study voluntarily. The parents were also requested to give consent for their children to participate in the study. The purpose of the study was communicated to the schools. The schools were informed that they had the right to withdraw from the research at any stage (Babbie & Mouton, 2001; Loots, 2011).
Trust and protection from harm	The information was shared with the school to explain the protection from harm. The importance of mutual trust was also discussed. The schools were assured that they would not be misled in any way (Elias & Theron, 2012).
Planning	The schools were given schedules. The researcher and the senior management team together with the Grade 1 teachers discussed the schedule in detail, especially the dates and times. This was to give the participants an idea of

Ethical consideration	Proposed strategies to enhance ethical conduct
	the amount of time that each data collection activity would take (Loots, 2011).
Data collection	I was always mindful of what to record. Pictures of the three classrooms were taken, but teachers and learners were not in the pictures (Babbie & Mouton, 2001; Ferreira, 2012).
Data analysis and interpretation	The results were compared with the current literature and negative instances and silences in the data were pointed out. Member checking was used (Babbie & Mouton, 2001; Ferreira, 2012).
Reporting and writing the research findings	The aim of the researcher is to present the true words of the participants. Limitations of the findings were reported (Babbie & Mouton, 2001; Ferreira, 2012).

The research was conducted in accordance with the ethical regulations of the Faculty of Education, University of Pretoria, which were discussed with the schools. As urged by McMillan and Schumacher (2001), I adhered to ethical standards and was at all times open and honest in explaining to the participants the purpose and the aim of the study.

The participants were assured of confidentiality, and they were treated with the utmost respect and dignity throughout the duration of the study. Pseudonyms were be used to protect the participants' identity (Babbie & Mouton, 2001). The participants were informed of their right to withdraw from the research at any stage (Babbie & Mouton, 2001; Loots, 2011).

I maintained the standards of professionalism as a researcher (Elias & Theron, (2012). More importantly, as a researcher I assured the participants that I would be accountable for the quality of the conducted study (Henning, Van Rensburg & Smits, 2004).

The study was conducted in North West. I requested permission from the Department of Basic Education to conduct the research. Once this was granted, the principals of the three schools were informed of the study.

Interviewing young learners raises various ethical issues, such as the challenge of influencing young learners with one's own view, with the possibility that results will be one's own reflection instead of theirs. The two principals, HOD and the three Grade 1 teachers had access to my interview transcriptions to check whether I had misrepresented them or not.

4.8.1 Ethical aspects redressing the imbalance: researcher-to-young-learner relationship

Research which involves young learners is often viewed with contempt, as the young learner is often seen as one who can be easily influenced by the researcher's views and may not necessarily reflect his/her own (Coad & Lewis, 2004).

To prevent the research study from being compromised, I took the following steps to ensure that Grade 1 learners felt comfortable and not intimidated:

- Young learners were interviewed and observed in their own school, which is their familiar environment. They were comfortable in their classroom sitting with their peers and their teachers.

- *Permission was sought from parents and Grade 1 learners themselves to interview and observe them. Young learners always feel obliged to please by echoing the adults' view point and not expressing their opinion. This can be a threat to the validity of the study. Coad and Lewis (2004) postulate the idea of researchers being gatekeepers. I therefore conducted my informal interviews in the presence of the teachers.

- The principals, HOD and the teachers knew beforehand that the interviews would be informal discussions in the classroom. The schools had the detailed schedules of the study and the interviews were included.

- As a Department of Education official, this research served my own interests and needs and those of the Grade 1 learners, teachers and parents. A follow-up programme with the schools is going to be developed, and this will follow up the learners' performance by the end of the year.

- No research is value-free, and the potential for subjectivity in learner-centred research has been documented. The research was therefore guided by principles of authenticity, credibility and trustworthiness to ensure that the learner's integrity was respected at all times.

- The research environment ensured that the child's voice truly represented his/her own views, that it was believable and did not echo other people's voices, and that what she/he said represented what she/he believed in.

- I was always aware that children's cognitive capabilities interact with their memory and emotions. Young learners can be inconsistent, at one point playing down their views and in another situation exaggerating them (Coad & Lewis, 2004). The informal interviews assisted me to listen more attentively to their discussions.

- Focus group interviews were used. It is always advisable to use group interviews with small learners rather than one-on-one interviews; it is a less intimidating and friendlier environment. They felt free in the discussions. I managed to a get richer and broader range of responses. Sitting with them gave me a clear understanding of their views, and there were new ideas that were generated from their debates. The group interview is ideal when you work with young learners.

4.9 ROLE OF THE RESEARCHER

In qualitative research, the researcher is seen as a primary research tool (Thomas, 2006). I informally visited the Grade 1 learners in all the three schools and explained the purpose of the study and discussed the research tools and process to the management of the three schools, the three teachers and their learners.

It was further explained in detail that their participation in the study was voluntary and they were welcome to withdraw from the study whenever they wanted to. As a researcher I adopted the role of interviewer, observer and interpreter in the study. It was imperative for me to be a sensitive observer. My roles included discussing and agreeing on plans with the three schools. Furthermore my role as a researcher entailed coming up with semi-structured interview questions and again being an attentive listener, asking follow-up questions, collecting and documenting data and lastly analysing it.

As I am a district official who monitors and supports schools in the same district, it was important not to abuse my authority. Subjectivity could easily have been a challenge; however, a journal helped me to always reflect on my role as a researcher.

I managed to remain neutral and maintained ethical standards throughout the research as expected (Nieuwenhuis, 2007). I was careful not to disrupt the lessons and class timetables. Below is a detailed discussion on how data were collected. My role as a researcher was clearly defined, and I emphasised that even though I was a district official, their participation should be voluntary. I assured them that my work relationship would not be affected should they not be interested in the study. The university letters that were presented assured them that I was not acting for the Department of Basic Education.

4.10 CONCLUSION

This chapter concentrated on the research design and methodology employed in this study, the research questions, sampling, data collection and analysis and ethical issues. The research did not have many hiccoughs. It was deeply satisfying to work with the three schools. The cooperation of the Department of Education, the two principals, the HOD, the three teachers, the learners and the parents made my work easy at all times.

Chapter Five highlights data analysis of the study.

CHAPTER FIVE

STAKEHOLDER PERSPECTIVES AND EXPERIENCES OF THE IMPACT OF THE DYNAMIC SOUND FIELD AMPLIFICATION SYSTEM (DSAS)

5.1 INTRODUCTION

The research design unit of analysis, instruments of data collection and the data collection processes were discussed in Chapter Four. The data collected responded to all the research questions about the utilisation of the dynamic sound field amplified system (DSAS). The study was guided by the use of evaluation (Fouché 2012) in this qualitative study. The study looked into evaluation approach in order to document DSAS as a programme**.** The process was discussed in detail in Chapter 4 *(Table 4.2).* Chapter Four explained and described the research undertaken, the sampling procedure used, the research tool and strategies employed in the data collection and the voices of the participants in the study. Data collection discussions were guided by the research questions discussed previously. Participants' responses were recorded during the data collection approaches mentioned earlier in the study, which were:

- The one on one semi-structured interviews with the two principals, one HOD, the three Grade 1 teachers and one class assistant.
- Informal talks and discussions were conducted with the learners in three schools.
- The classroom observations in the three Grade 1 classrooms.
- The one on one semi-structured interviews were conducted with the district speech language pathologist and audiologists during lunch time in their offices.

In this chapter, data that I collected during the fieldwork at the three primary schools in the North West Province Makgona, Mooi and Swallows Schools were

presented. In a qualitative study, data collection, processing, analysis and process should never be viewed as a linear process, but as a continuous process (Nieuwenhuis, 2007). Schurink, Fouché and De Vos (2012) elaborate that analysing data is a process of inductive and deductive (tests before, during and after) reasoning. It is treated as science because of the credible evidence that is collected for the study, but it is also an art, because it allows creativity and ambiguity (Maree, 2011). In this study I applied inductive reasoning, i.e., I started working from the more general to the more specific (theory, hypothesis, observation and lastly confirmation) (Trochim, 2006).

Common ideas were bundled together and systematically organised into themes and sub-themes for thematic discussions. This was done in cognisance of the research questions outlined in the study. The reported results were sorted according to the emergent themes.

The main aim of data analysis is to draw meaningful and trustworthy conclusions, without favour or bias. In this study I followed the six steps (transcription, organising data, reading through data, coding, themes and interpretation) as guidelines (Schurink, Fouché & De Vos, 2012).

“The transcriptions are captured so that the researcher can focus on and look for codes and emerging themes” (Ntuli, 2010:32). I transcribed all the available data from the semi-structured interviews, observation, the reflective journal and non-verbal cues. I went through the transcription more than once. Creswell (2009) explains that organising involves sorting and arranging data. I managed to break down collected data into themes. This was done by defining categories for data analysis and writing the final product (Schurink, Fouché & De Vos, 2012). The inventory helped me keep track of my work, served as a checklist for my observation and semi-structured interview transcriptions and helped me close all the possible gaps in my study (Schurink, Fouché & De Vos, 2012). I went through my data, read it over and over again and made summaries (Lacey & Luff (2001). This process is commonly known as memoing, and it also enabled me to do coding (Maree, 2011).

Babbie (2008) defines coding as classifying individual pieces of data. Creswell (2009) explains it as the process of organising before segmenting material in order to extract meaning from the information. Coding assisted me to retrieve data of the same thematic ideas (Maree, 2011). I generated themes that consisted of ideas, phrases used that I found in the data (Maree, 2011). Finally, I interpreted data by explanations and trends that emerged from my data as themes (Mouton, 2012), which enabled me to draw conclusions based on the findings from the data in terms of validity and reliability (Maree, 2011).

5.2 ANALYSIS OF PARTICIPANTS' PROFILES

The biographical information about the participants, such as gender and age, home language, academic and professional qualifications, foundation phase specialisation and years of teaching experience were sourced from the participants.

All the information assisted me in my analysis of the research participants' personal and professional backgrounds in relation to their knowledge and experience to teach the Foundation Phase.

Table 5.1: Demographic Information of Research Participants

School (pseudo-nyms)	**School manage-ment**	**No of learners Grade 1**	**Learners' language**	**Teachers' language (1 per school)**	**[1 class assistant]**	**LoLT**	**Years of experience**
Makgona	Principal	Boys: 32 Girls: 31 Total : 63	All Setswana	Setswana	[Setswana]	Setswana	36 [2]
Mooi	Principal	Boys: 14 Girls: 22 Total: 36	All Setswana	Afrikaans	None	English	20
Swallows	HOD	Boys: 13 Girls: 18 Total: 31	Afrikaans Setswana English	Afrikaans	None	Afrikaans	34

Makgona School

Grade 1 learners totalled 63 in the class at the Makgona School site for my study. That total was made up of 32 boys and 31 girls. There was a vacant post that had not been filled at the school, which is why the teacher had such a high number of learners in her class. The Grade 1 teacher had 36 years' teaching experience. The School Governing Body suggested having a class assistant to work with the Grade 1 teacher. The person appointed did minor administration work like making copies, handing out and collecting reading and work books. She also assisted with playtime supervision.

She had two years' experience as a class assistant. All learners, teachers and the class assistant were Setswana speakers. Setswana is the language of learning and teaching in the Foundation Phase. The school has a principal.

Mooi School

There were 36 learners in Grade 1 at the Mooi School, consisting of 14 boys and 22 girls. The Grade 1 teacher had 20 years' teaching experience. All learners and the head of department were Setswana speakers. The principal and all the teaching staff were Afrikaans speakers. English is the language of learning and teaching. The school has a principal.

Swallows School

There were 31 Grade 1 learners at Swallows School – 13 boys and 18 girls. The Grade 1 teacher had 34 years' teaching experience. There were a few Afrikaans and English-speaking learners; the majority of the learners and all the teaching staff were Afrikaans speaking. Afrikaans is the language of learning and teaching. The school did not have a principal; the post was still vacant.

Table 5.2: Research Participants' biographical particulars

School (pseudonyms)	Teacher	Class assistant	Age	Gender	Highest Qualifications
Makgona	1		52	Female	Bachelor of Education
		1	45	Female	Grade 12
Mooi	1	0	55	Female	Primary Education Diploma
Swallows	1	0	56	Female	Primary Education Diploma

Table 5.2 shows the schools, the number of teachers and class assistant atheir ages, gender and highest qualifications.

Teachers' language proficiency

All 3 teachers had appropriate qualifications to teach in the Foundation Phase. However, English is not their home language. Both Afrikaans teachers had studied in Afrikaans as a language of teaching and learning to university level. Therefore they found it difficult for them to teach English First Additional Language (EFAL) in Grade 1. All three teachers had received training on teaching Foundation Phase English First Additional Language. Both Makgona and Swallows schools' teachers could teach in English because learners from Grade R had been introduced to the language, unlike the Mooi School, where there was no Grade R class.

Table 5.3: Research Participants experiencing specific learning barriers

Name of school (pseudonyms)	**Learners' hearing and other disabilities in the classrooms**	**Learners' performance and behaviour observed during EFAL periods conducted with acoustics apparatus**
Makgona	3 boys with mild hearing loss 1 boy with visual impairment 2 girls with learning disabilities	The 3 boys with hearing loss able to hear teacher and participated in all oral activities. The 2 girls with learning disabilities followed instruction very well.
Mooi	2 boys with learning disabilities	The 2 boys participated fully in the classroom.
Swallows	1 boy and 1 girl with Attention Deficit Disorder (ADD). Neither were able to concentrate and pay attention in class. Both were on medication.	The boy was still a bit restless, but was attentive in the morning and completed his work. This happened before break. The teacher always had to call his name to get his attention. The girl followed instructions.

Table 5.3 shows that the three schools are mainstream schools but admit learners with specific learning barriers. The Inclusive Education Policy states that learners who need a low to moderate level of support have the right to be admitted to a mainstream school that is close to their homes (Department of Basic Education, 2001). It is therefore important to state that learners in all of the three Grade 1 classrooms had different abilities.

Makgona School

The learners' average age was 7 years. They had all attended Grade R, which is attached to the school. In Grade 1 there were three boys diagnosed with mild hearing loss, one boy with visual impairment and two girls with specific learning disabilities. The three boys with mild hearing loss were able to hear the teacher. They participated in all the oral activities. The two girls with specific learning disabilities followed instruction very well. The class assistant was always available to assist these learners whenever they needed extra support.

Mooi School

The average age of learners in Grade 1 was 7 years. The Grade R class was private, even though it was within the school's yard; therefore the principal and the head of department did not have a say in what learners were taught in that Grade R class. Two boys with learning disabilities were identified in Grade 1; however, they participated in all the oral activities in the classroom, as they were able to hear and understand the teacher's instructions.

Swallows School

The average age of the learners in Grade 1 was seven years. The Grade R class is attached to the school. One boy and 1 girl were diagnosed with Attention Deficit Disorder (ADD). They could not concentrate and pay attention in class and were on medication. I was informed that the boy was often restless just before break, even with the utilisation of the DSAS.

He was often attentive in the morning and completed his work. The teacher always called his name to get his attention. The girl followed instructions and completed all the tasks.

Table 5.4: Biographical Information of District Specialists

Area of work (pseudonyms)	Profession	Qualification	Experience	Gender	Age
District 1	Speech and Language Pathologist and Audiologist	Bachelor degree Speech and Language Pathology and Audiology	3 years	F	25
District 2	Speech and Language Pathologist and Audiologist	Bachelor degree Speech and Language Pathology and Audiology	6 years	F	36

Table 5.4 shows that the speech and language pathologist and audiologists who work in all schools in the district have an appropriate degree. They both have experience working for the Department of Health and later for the Department of Education. The emphasis of their work was on early identification of barriers to learning and early intervention.

5.2.1 Codes for participants

It was felt that the use of pseudonyms would enhance the anonymity of participants in the study. Data collected on academic and professional qualification, experience, gender and age might indicate the participants' professional maturity, competence level and the Foundation Phase teaching experience. In order to maintain anonymity, codes were assigned to the responses that emerged from the transcripts (Creswell, 2014). Therefore, the codes in Tables 5.5, 5.6, 5.7 and 5.8 were used.

Table 5.5: Codes for Makgona participants

Code	Participant
T-MAS	Makgona School teacher
CA-MAS	Makgona School class assistant
L-MAS	Makgona School learners
P-MAS	Makgona School principal

Table 5.6: Codes for Mooi participants

Code	Participant
T-MOS	Mooi School teacher
L-MOS	Mooi School learners
P-MOS	Mooi School principal

Table 5.7: Codes for Swallows participants

Code	Participant
T-SWAS	Swallow School teacher
L-SWAS	Swallow School learners
H-SWAS	Swallow School head of department

Table 5.8: Codes for District Participants

Code	Participant
SLA.1-DIST	1st District Speech and Language Pathologist and Audiologist
SLA.2-DIST	2nd District Speech and Language Pathologist and Audiologist

Tables 5.5; 5.6; 5.7 and 5.8 above is classification of all the participants in different codes to assist with the understanding in line with my evaluation study.

5.3 ANALYSIS AND INTERPRETATION OF QUALITATIVE DATA

The primary purpose of conducting a qualitative study is for qualitative analysis to transform data into findings (Schurink, Fouché & De Vos, 2012). The qualitative analysis process includes reducing raw data to work with the important information only (Patton, 2002). In this study, I separated and fused emerging themes by separating and taking apart the data and putting it back together (Creswell, 2014). There were instances during the data collection process when data sourced from the participants seemed ambivalent. This data was then triangulated with data sourced through observation and more probing during the interviews. Throughout the research, there were instances where I separated and fused emerging themes. Data from observations during fieldwork were included in the thematic discussion.

Table 5.9 introduces the three themes and categories arising from data analysis and discussions. The identified themes are

(i) Improved classroom communication,

(ii) Effective teaching and learning utilising DSAS and

(iii) Sub-standard infrastructure and its impact on the efficacy of the DSAS.

These themes emerged from participants' actual statements made during semi-structured interviews. The verbal responses in this chapter will be indented and italicised, and will assist in the understanding of raw data.

Table 5.9: Analytical Strategy: Research Themes and Categories

THEME 1 **Improved classroom communication**	
Category 1	Interaction between the teacher and learners, between learners
Category 2	Reduction of noise
Category 3	Audibility of teacher and learners

THEME 2 **Effective teaching and learning with DSAS**	
Category 1	Attentive Grade 1 learners in the classroom during the EFAL period.
Category 2	Increased EFAL performance of learners
Category 3	Teachers' absenteeism because of ill health

THEME 3 **Sub-standard infrastructure and its impact on the efficacy of the DSAS**	
Category 1	Absence of policy on noise control
Category 2	Sub-standard infrastructure compromising the efficacy of the system
Category 3	Burglary
Category 4	Load shedding
Category 5	Classroom walls not noiseproof

5.4 THEMATIC DISCUSSION OF THE RESEARCH FINDINGS

5.4.1 Theme 1: Improved classroom communication

Good classroom communication requires an environment where learners can hear and understand what is being said in the classroom. It is equally important for a teacher to hear learners and for learners to hear their peers (ASHA, 2016).

Good classroom communication is important to achieve the following:

(i) understanding speech,
(ii) reading and spelling ability,
(iii) behaviour in the classroom,
(iv) attention,
(v) concentration, and
(vi) academic achievement.

Unfortunately, with poor classroom acoustics, communication breaks down and there cannot be any effective teaching and learning. Learner-based factors such as language and social deprivation will be immensely affected (ASHA, 2016).

Category 1: Interaction between educator and learners and between learners

Interaction is crucial in the learning and teaching environment. The teacher's ability to teach depends on the ability of all learners in the classroom to hear her. The study confirmed that interaction within the classroom is improved by the use of dynamic sound amplification. During the observation it was clear that interaction was a great success because learners listened to the teacher. T-SWAS supported this when she said:

T-SWAS: *The DSAS has made my work easy to work with my learners and those diagnosed with disabilities. My learners sometimes struggle to differentiate Afrikaans and English, However the DSAS assist the learners to hear the difference. Almost all learners in the classroom have the knowledge of sounds and their reading skills have been*

developed. One great advantage of the DSAS is that when an aeroplane passes, my voice automatically goes higher than the disrupting noise.

Young learners sometimes struggle to distinguish their teacher's voice from chatter of classmates (DeBonis 2015; Ryan & Logue-Kennedy 2013). DSAS made it easy for the learners to differentiate the teacher's voice from the classmates' chats, because the voice of the person who has the microphone is more audible than the ambient sounds.

Teachers and learners responded favourably to the installation and the use of the DSAS in the Foundation Phase (FP). They expressed this as a life-changing experience. T-MAS said:

T-MAS: *This equipment is a life saver. All my learners can hear me and differentiate the sounds because they can hear them well. I can reach them all since I started this equipment. Shy learners and the ones with soft voices are also participating in class more especially when it is their turn with the microphone, they feel in control. They enjoy school because they can also be listened to and be heard by other learners when they use the microphone. My classroom is not as noisy and disruptive as before, it is more manageable and I really enjoy teaching now. I do not have any problem with my throat, and I don't get too exhausted by the end of the day.*

P-MAS commented as follows on her teacher's improved health:

P-MAS: *I appreciate the fact that my Grade 1 teacher's health is better. She does not complain with a sore throat anymore. The Grade 1 class is still huge, but it more manageable since the use of the DSAS.*

The learners knew that it was their turn when they had the microphone in their hand. This made learners feel acknowledged, and they enjoyed being in school. Learners who used to be absent most of the time; now attended school every day. The DSAS worked well especially at Makgona Primary school, where the class

was overcrowded. T-MAS mentioned how the DSAS has assisted the interaction in her class:

T-MAS: *I do not have to scream when I teach my learners. My voice is equally audible to all learners. It is easy to manage a huge class; my learners are calm, and more attentive. Even when I teach the new sounds I do not have to repeat it over and over again even for learners who are struggling. This has improved their performance and participation in the classroom.*

The learners in all schools were all excited about the DSAS. The majority of them mentioned that their teachers were seldom upset with them. The learners were attentive all the time and they could hear well; teachers did not have to repeat themselves. I observed T-SWAS having trouble to get the attention of the two boys in her class, and she mentioned the following:

T-SWAS: *Despite the positive attributes the DSAS has on teaching and learning, it is difficult sometimes to get the attention of the two boys in my class, they can be disruptive. In the mornings they are fine, when they are not tired, which is a plus because we are able to do most of the work in the mornings.*

The teacher understood that according to the Inclusive Education Policy, learners have a right to be placed in a mainstream school that is close to their homes as long as they do not need the high-level support that is provided in special schools (Department of Education, 2001). The school admitted the two boys who had been diagnosed with Attention Deficit Disorder (ADD) by medical professionals. One learner at Swallows School spoke about the benefits of the DSAS. This feeling, which was representative of the whole class, is reflected in the following response:

L-SWAS: *I love it, more especially when I am given the microphone to read and speak in the classroom. It is now better in the class our two classmates who were always disturbing us and making our teacher angry in the classroom have stopped now.*

Most learners were keen to use the microphone. Most learners at Makgona School registered unhappiness because they felt that they were never given enough opportunity to use the DSAS. Their teacher argued that too many microphones in the class can become disruptive. With one microphone, the learners needed to understand that only one learner with a microphone in his/her hand could speak at a time. They were, however, allowed to participate without the microphone in their small groups.

The learners in the other two schools never complained about the use of the microphone, except one learner at Mooi School, who looked unhappy when she felt that two learners were given more opportunities than the others. It was explained to them that one learner was extremely shy, so she preferred reading softly and sitting next to the teacher; the second learner's voice was very small, and the DSAS amplified it. After that explanation all learners were happy, and they still got their turn to use the DSAS. T-MOS corroborated the above sentiments by saying:

T-MOS: *My learners enjoy using microphone whenever they get an opportunity. Sometimes even if a learner is not confident and sits next to me reading, she or he feels like it is just the two of us. They read much better. This improves their reading ability.*

L-MOS: *Our teacher can still give instructions when she has been called to the principal's office.*

He said this giggling with amusement.

T-MOS: *I am so careful with this equipment. The service provider warned me strongly to always remember to switch it off when we discuss learners' cases with the management or the school-based support team (SBST).*

T-MOS: *The service provider also warned me to always remember to switch off the microphone when I go into the bathroom.*

She said this with a laugh.

In this study the installation and the use of the DSAS in the Foundation Phase (FP) has been life-changing to both the teachers and the learners. I observed great classroom management; teachers were in total control of their classrooms and learners participated in the activities. The classrooms were learner-centred and the teacher was audible at all times. I noticed that learners were eager to learn and having fun in the three classrooms. During my observations I sat at the back of the classroom, which enabled me to judge the audibility of the teachers.

I was also able hear when learners were using the microphone. It was mentioned by all three teachers that there was a great improvement in classroom communication.

Category 2: Reduction of noise

Soli and Sullivan (1997) explain that there are number of learners with normal hearing who experience difficulties in a classroom where there is noise or reverberation. They also explain that the ability to listen in a noisy environment is not developed until a child reaches adolescence. It is one of the challenges that learners in the townships and rural schools are faced with because of overcrowded classrooms.

This makes it difficult for the teacher to be audible enough to all learners in the classroom. In all of the three schools the noise and reverberation within the classrooms still existed; however, the DSAS lessened its effect. The three teachers agreed about reverberation:

T-MAS: *I think because our class is overcrowded, we do not experience any re-echoed sounds in the classroom, which is an advantage.*

T-MOS: *We are not experiencing any reverberation, maybe the DSAS overpowers that.*

T-SWAS: *My class is not crowded but with furniture, book shelves, equipments and the DSAS the reduction of noise is great. When I teach there is no disturbing noise between my kids and I.*

The two speech and language therapists and audiologists gave the same responses about the reverberation that the three classrooms still experienced even with the utilisation of the DSAS.

SLA.1-DIST: *I think the system cuts most of it; what is left is not significant to cause a problem, especially if we are dealing with concrete buildings.*

SLA.2-DIST: *Little to no reverberation, depending on the environment it's used in*.

The speech and language therapists and audiologists explained that even with the utilisation of the DSAS, little to no reverberation will exist. Their responses further mentioned that the level of the reverberation always depends on the building. In all three classrooms, the buildings were of bricks and mortar and the noise within the classrooms and outside the classrooms still existed, but the conduciveness of the classroom was enhanced by the utilisation of the DSAS.

Category 3: Audibility of teachers and learners

Brace (2006) explains DSAS amplifies the teacher's voice evenly throughout the classroom and relative to the background noise. The sitting position of the learners didn't disadvantage them at any given moment. All learners could clearly hear the teacher. There were instances where teachers stood anywhere in the classroom or faced the chalkboard, and all learners could still hear her voice clearly.

T-MAS mentioned that even though their class was crowded, they could all hear their teacher clearly, irrespective of where the teacher was standing. Some learners mentioned that their ability to learn to read quickly was because they could hear their teacher well when she pronounced words.

L-MAS: *I used to rely on my friends to repeat our teacher's instructions.*

L.-MAS: *I like sitting at the front, I can hear our teacher even if she is standing at the back*

DSAS as a tool for keeping down noise

Makgona School is in a rural village. There are seldom people passing by the school, as it is in a quiet area; however, one huge disadvantage of the Grade 1 class was overcrowding. Shield and Dockrell (2003) claim that while external noise might be considered a drawback for learners, there is little evidence of the relationship between internal and external noise levels. During my observation at Makgona School the only external noise was when the Grade R learners went outside for activities, and on one day where there was a loud noise outside the classroom when the gardener was mowing the lawn. It did not seem to distract the learners. Even though the Grade R classrooms were just behind the Grade 1 classroom, the classes were never disrupted, as the teacher's voice was amplified. T-MAS stated that:

T-MAS: *I do not have to scream when I teach my learners. My voice is equally audible to all learners. It is easy to manage a huge class; my learners are calm, and more attentive. Even when I teach the new sounds I do not have to repeat it over and over again even for learners who are struggling. This has improved their performance and participation in the classroom*.

In Swallows School, which is in town, there were often delivery trucks, cars and motorbikes moving up and down the road. The Grade 1 learners were not disrupted; the DSAS automatically amplified the teacher's voice above the external noise. T-SWAS stated that:

T-SWAS: *The DSAS has made my work easy, to work with my learners and those diagnosed with disabilities. My learners sometimes struggle to differentiate Afrikaans and English; however, the DSAS assist the learners to hear the difference. Almost all learners in the classroom have the knowledge of sounds and their reading skills have been developed. One great advantage of the DSAS is that when an airplane passes, my voice automatically goes higher than the disrupting noise.*

Makgona, Mooi and Swallows Schools are in completely different environments. However, the Grade 1 teachers of all the three schools shared the same sentiments. All the Grade 1 teachers and learners enjoyed the same benefits irrespective of the number of learners that they had in their classrooms. All three schools had curtains on their windows, which also improved attentiveness, because learners can easily be distracted by movement outside their classrooms.

5.4.2 Theme 2: Effective Teaching and Learning utilising DSAS

In all my observations, quality teaching and learning was provided. At Makgona School learners were taught greetings – "thank you", "please" and "may I?". It was an exciting lesson where they role-played shopping. They had an opportunity to go into the shop, greet the shopkeeper and use all the phrases that were taught.

They were excited because whoever was talking was allowed to use the microphone. In the end, the teacher only allowed the shy ones and the ones with small voices to use the microphone.

Category 1: Attentive Grade 1 learners in the classroom

In all schools learners were attentive most of the time. The Swallows Primary teacher struggled with the two boys whose disabilities were diagnosed as severe, and they needed more support than other learners in the classroom. All three schools had curtains, which prevented learners from being distracted by outside movements. Mooi and Swallows Schools had desk dividers, which allowed the learners to look at the teacher without disturbing the learners sitting next to them.
The two speech and language pathologists and audiologists emphasised the importance of installing the DSAS in junior classes, starting with Grade R, as it would develop their hearing skills.

SLA.1-DIST: *Yes, the teacher would not strain her voice to reach learners far from her, less repetition by teacher, which will save her time explaining one concept a million times, hear and understand language better.*

Overall improves learner performance.

SLA.2-DIST: *Should be installed in Grade R with the support of therapist together with the Health Department to support the intersectoral collaboration and early identification programmes.*

SLA.1-DIST: *Yes, they are essential. They will assist young learners whose hearing is not well developed.*

SLA.2-DIST: *Normal hearing learners still can benefit from them, because background noise is significant reduced which increases attention and concentration*.

SLA.2- DIST: *Easy learning understanding of phonics, improving their spelling and making it easier to learn English.*

Help with language acquisition, spelling and comprehension.

Easy learning understanding of phonics, improving their spelling and making it easier to learn English.

The learners were later requested to read individually, for which they had to volunteer. The teacher never had trouble getting volunteers, because they enjoyed using the microphone.

In the next period, the learners played card games using the same sounds and also getting the sequence of the story. It was exciting for them to end a lesson with a game, which was also part of learning.

At Makgona School, the presence of the class assistant added to the support and was a relief to the teacher. Learners were all attentive because the teacher knew all her learners by their names – something that cannot be taken for granted. That made all learners feels special and loved. At Swallows School, the Grade 1 teacher was pleased with the work of the two learners experiencing barriers to learning. The speech and language therapists and audiologists explained the importance of developing the young learners' hearing. They said that if the teacher did not use the DSAS, it would be difficult for the learners to concentrate, and the

teacher would find it difficult to manage the class even with the help of a class assistant.

Category 2: Learners' increased EFAL performance

All of the three schools, the two principals, the head of department (HOD) and the three teachers stated in the interviews that their learners had improved in their overall behaviour and their attitudes towards learning how to read and spell.
This was evident in their positive attitudes when they had to read when sitting for annual national assessments (ANA). I observed the eagerness of the learners wanting to do their best and participate. All three schools had computer laboratories installed with reading programmes, fully stocked school libraries and reading corners in their classrooms. Reading was taken very seriously in the three schools. It was even mentioned that learners' performance in the spelling competition had improved.

P-MAS: *By the end of the year all the Grade 1 learners know their sounds. They are able to read and to spell at their level.*

At Makgona School, I observed lessons where learners were taught English sounds and new words to prepare them for reading. They all participated in pronouncing the sounds correctly. In the period that followed, they read. The teacher read to them.

Later on learners read in groups with the help of the class assistant. Individual learners volunteered to read to the class, using the microphone, and all learners could hear them, despite the fact that the class was big.

At Mooi School learners were taught phonics. They repeated them after the teacher. The teacher read a story to them, they were all attentive and followed and enjoyed the story about the seasons. The teacher asked them questions to see if they understood the text. They worked in pairs to match the correct clothes for the different seasons. Their communication, reasoning ability and team work was also developed in the exercise. At Swallows School, learners were taught English sounds and they participated by repeating the sounds. Thereafter the teacher read

from their graded reader. It was easy for them because the text had all the sounds that they had practised.

T-SWAS: *Using the DSAS assist me to hear myself when I pronounce the words. Since English is not my mother tongue I practise first at home. This help me to teach my learners correct sounds, because they are also Afrikaans speaking it is easy for them to confuse the Afrikaans and English sounds.*

The three teachers used the DSAS at all times. They all felt that the DSAS had changed their lives. The two SLA-DISTs agreed on the importance of the difference the DSASs mad in the Grade 1 classrooms during the teaching and learning of English First Additional Language:

SLA. 1-DIST: *It is important for the learners to hear the correct sounds. The DSAS is essential to assist.*

SLA. 2 –DIST: *It is common for Afrikaans and English to be confused. Therefore the use of DSAS helps learners to hear the sound clearly.*

The use of the DSAS in the three schools helped learners to hear and learn the English First Additional Language (EFAL) sounds and they gained the interest and the passion to learn to read, speak and spell correctly. At Swallows School, I observed learners being trained for public speaking in English:

P-MAS: *One Friday a term, we have an event where parents are invited and learners read, have short plays and play EFAL games.*

At the end of the year in Grade 1 learners are encouraged to write simple reading books, with illustrations. Learners decide on the topics with the help of the teacher and a class assistant. This is a practice that is taken seriously. Learners work in small teams.

Mooi and Swallows Schools have fully resourced enrichment centres. Learners experiencing learning barriers are referred to the centre for extra learning support.

P-MOS: *Learners who are still behind with their sounds and basis reading skills are referred to the enrichment centre for them to be given individual support. This intervention helps our learners. The emphasis is on teaching EFAL sounds and basic reading skills.*

In my observation at Mooi School, learners who are perceived to be doing well with their school work are also welcomed to visit the enrichment centre to play English games and chess and to read books of their choice.

The principals, HOD and teachers are positive that their Grade 1 learners will be fluent readers by the end of Grade 3. This is important for learners' performance throughout their school years. In all three schools, there was a concern that learners' performance might deteriorate when they went to the next grade, where there was no DSAS, as they would still be in the Foundation Phase. The general feeling of the principals, the HOD and the three Grade 1 teachers in all of the three schools was that learners would struggle without the enhanced sound.

Category 3: Teachers' absenteeism because of ill health

Teachers tend to use their voices intensively for a prolonged time because classes are overcrowded. In an unhealthy working environment, such as noisy classrooms with poor acoustics (Gotaas & Starr, 1993), vocal fatigue leads to increased stress among teachers and high absenteeism. It also has an effect on a teacher's career if not treated properly. The two principals, the HOD and the three teachers all agreed that each and every teacher should have this tool in her classroom.

T-MAS: *I do not experience sore throat all the time, like I used. I also do not suffer from exhaustion. The DSAS assist me to speak softly and still heard by all learners. My doctor is also impressed with my recovery.*

P-MAS: *Her health worried me, and she is the kind of a teacher who will insist to come to school even when she is not well. I used to force her to stay at home until she was well.*

P-MAS: *I appreciate the fact that my Grade 1 teacher's health is better. She does not complain of a sore throat anymore. The Grade 1 class is still huge, but it is more manageable since the use of the DSAS.*

All participants benefitted from the DSAS. It can be a challenge for a school to have a teacher who is often not well. Her learners were sometimes without their teacher for days, which frustrated the teacher. That was the case with T-MAS, for whom everything changed for the better with the use of the DSAS.

5.4.3 Theme 3: Sub-standard infrastructure and its impact on the efficacy of the DSAS

In this study the term infrastructure covers the buildings, security, electricity, availability of all the necessary resources and assistive devices. Good infrastructure is critical in the teaching and learning environment. In all three schools, no major disadvantage of the use of the DSAS to the teachers and learners was recorded.

Category 1: Non-availability of policy that deals with noise control

Below are the responses of the participants about policy on background noise. The participants were further probed to share their views and knowledge of the existence or nonexistence of the policy. The participants all had different views.

T-MAS: *I do not think that we have that policy. If there is one I am not aware of it.*

It is one area that has been neglected by the Department of Education. There is a need for that policy.

CA-MAS: *I do not know if there is a policy.*

There is a need for that policy.

P-MAS: *No, there is no policy framework supporting the classroom background noise. However we do have the Inclusive Education Policy, it speaks about accommodating learners with different*

disabilities. I am thinking that we might not have a specific policy about the background noise, but the Inclusive Education Policy is supposed to accommodate the background noise challenge.

All what needs to happen is the National Inclusive Education Officials to assist schools to reduce the background noise.

The principal, teacher and class assistant of Makgona School were not aware of any policy on background noise, but agreed that that there was a need for such a policy. The principal stated that the Inclusive Education Policy might be relevant, because if it was not, the Department of Education was neglecting this important aspect of making the classrooms conducive.

T-MOS: *No, I don't think so, because I have never heard about it.*

It is sad for the department never to think about that. These days we have many learners with specific learning problems in our societies.

P-MOS: *There is no policy framework that precisely talks about the background noise. However, the Inclusive Education Policy emphasised accommodating learners who need different level of support. Therefore ideally the classroom background noise is supposed to be catered for in the Inclusive Education Policy.*

It has never been raised by education officials, but sitting here I am convinced that it is in the Inclusive Education Policy. All what needs to happen is for the department to break it down, implement the policy and our problems will be over.

The Mooi School teacher seemed to be uncertain. The principal raised the Inclusive Education Policy. He sounded certain of his view.

T-SWAS: *No, we do not have it; if we had it our union could have informed us.*

It is an oversight; hopefully the department will consider that when they review policies.

H-SWAS: *There is no policy that talks about the background noise and how it should be treated.*

It is just disappointing that we do not have that policy. None of the officials understands how teachers struggle just to get learners to hear you.

The Swallows School teacher and the HOD were certain that there was no policy on background noise and expressed disappointment about the department neglecting such an important aspect.

SLA.2-DIST: *White Paper 6 talks about diversity that will include background noise. The SIAS Policy also talks about screening, identification, assessment and support.*

SLA.2-DIST was certain that the Inclusive Policy covered the background noise.

There were participants who were certain that there was no policy on background noise in the classroom. Others were not certain and assumed that it was covered in the Inclusive Education Policy. Their argument was that background noise could be a barrier to teaching and learning, and the Inclusive Education Policy advocated a conducive environment of teaching and learning (Department of Basic Education, 2001). The principal of Makgona School pointed out that there was no policy that specifically focused on background noise; however, she was certain that Inclusive Education dealt with this issue. The second speech and language pathologist and audiologist shared this view that accommodating diversity meant dealing with background noise.

Category 2: Sub-standard infrastructure compromising the efficacy of the system

SLA.2-DIST, principals and the HOD raised the issue of DSAS not being enough for Grade 1 classes. This equipment is essential for all teachers to have, more especially in the Foundation Phase (FP).

SLA.2-DIST: *The Grade 1 learners' listening skills would not be fully developed by the end of the year. Nobody should be surprised when the same learners' performance drops*.

SLA.2-DIST felt very strongly about continued use of the DSAS in the FP:

T-SWAS*:* *We only have DSAS in the Grade 1 class and not have them in other classes; some of the learners' performance might deteriorate. It would be better if the whole Foundation Phase is catered for.*

T-SWAS also raised the concern that the learners' performance might deteriorate once they were in a classroom without a DSAS:

SLA-DIST: *Learners' listening skills are not fully developed when they are young. Their auditory processing disorders are often confused learning barriers. Most learning is accomplished through hearing. If these learners are not identified and given the necessary support they are commonly classified as learners experiencing learning barriers.*

The importance of equipping all FP classes with DSASs was raised during the semi-structured interviews. It would reduce the number of learners wrongly diagnosed with learning disabilities and also assist will early identification and intervention for specific learning problems, all of which would reduce the high number of learners who are placed in special schools.

Not enough microphones for learners in big classes

Learners experiencing specific learning disabilities in Swallows School were observed, and their participation was also noticeable with the use of the microphone. Mooi School learners enjoyed using the microphone, even though one learner complained about not being given an opportunity to use a microphone. My observation in all of the three Grade 1 classes was that L-MAS, CA-MAS and T-MAS were the only ones for whom the availability of a single microphone was a problem, and this was because of the high number of learners that they had in the Grade 1 class. In the other two classrooms, learners took turns to use the microphone. This point was raised by some learners; however, the teachers had a different perspective. I observed that they were managing quite well with one microphone.

T-MAS: *There is an urgent need for 4 more microphones in this class. It is difficult for the microphone to reach most learners.*

During my observation, the teacher's need for more microphones was stated more than once to her learners, as they were also complaining to her. It was clear that the teacher would have had hard time if she did not have a class assistant for such a big class.

Category 3: Burglary in schools

This was a general challenge in schools in North West, so the three schools had all insured all their equipment and beefed up the security around their schools. All three schools were fortunate to have communities that are involved in their schools. The three schools are also in the Adopt-a-Cop programme. I observed the T-MAS taking her DSAS to the principal's office:

T-MAS: *I can never leave this equipment in my class overnight. I am scared that I will not find it the following day.*

P-MAS: *We do have wonderful community around the school, but it is our responsibility to be extra careful. You cannot trust people with movable items. All our movable valuables are locked in the strongroom every day.*

SLA. 1-DIST: *As much as the DSAS are important for schools more especially in the Foundation Phase, they can be expensive. Not all schools can have the money to replace the equipment if they are stolen*.

The DSASs are essential to schools in the North West Province. The DSAS is easy to move, therefore they can be easily stolen in a case where security is lacking. In cases where theft is a risk, the only solution that the school has is to lock them up in a safe place. The next day they are simply plugged in and are ready to use.

Category 4: Load shedding

All three schools experienced load shedding. Load shedding is the deliberate shutdown of electric power in parts of power distribution system in order to prevent the failure of the entire system should the demand strain the capacity of the system (Thesaurus, 2010). Swallows and Mooi Schools are able to charge their equipment overnight. Because of the excellent security, their DSASs remain in the classrooms. Therefore, the two schools are never affected if they experience load shedding during school hours. In Makgona, they could not charge their equipment overnight because of security threats.

I once observed the teacher teaching without charged equipment, and the school did not have electricity on that day. It was a challenge for the T-MAS, CA-MAS and L-MAS. The teacher needed to speak louder for learners to hear her. T-MAS shared her frustration:

T-MAS: *It is so difficult to teach these learners without my equipment. I get the feeling that they do not hear me. The classroom is a bit*

disorganised. I have to say one thing more than twice. This is going to be a long day. I am exhausted already.

CA-MAS: *Without the DSAS I have to move around to repeat what the teacher's instructions.*

We are right at the back, we can't hear our teacher. It is difficult for our class assistant to get closer to us because of all these desks.

Category 5: Classroom walls not noiseproof

The noise in the classroom is made up of external noise which is channelled through the building envelope and internally produced noise (Shield & Dockrell, 2003). Learners in a classroom may be exposed to noise from different sources. External noise is often caused by delivery trucks, vehicles, motor bikes and airplanes.

External noise can be caused by factories, learners who are maybe outside on break and people outside the schoolyard. The other source of noise which is natural and can disrupt teaching and learning is the noise of rain on the school roofs, thunder and wind.

T-SWAS: *We are in town. Noise of vehicles, motorbikes makes it difficult for my small learners to concentrate in class. Even with the curtains it is still difficult to reduce the background noise. There are learners with learning barriers who find it difficult to understand in a noisy environment. Giving instructions and expecting them to follow them, it's an unrealistic task.*

The three schools are built of bricks and mortar, which is a good structure. The challenge that Makgona School has is that the classroom is too small for the high number of learners. The Grade R classes were just behind the Grade 1 classrooms. Both in Swallows and Mooi Schools, there was no evidence of poor infrastructure. T-MAS mentioned that:

T-MAS: *The buildings of the schools should be in such a way that the background noise is reduced. The suppression of the background noise is very crucial. I think that it should be prioritised for all the learners in schools, more especially the young ones.*

I noticed that in all schools, the structures did not have provisions to reduce reverberation. None of the classrooms had soundproofing, which increased the background noise in the classrooms. This was also confirmed by the results that I got from the two speech language pathologist and audiologists when they measured the background noise in the classrooms with no learners. This was discussed in Chapter 4.

5.5 CONCLUSION

The analysis in this chapter explored participants' appreciation and understanding of the use of the DSAS during the English First Additional Language teaching in a Grade 1 classroom through evaluation research methodology. The study employed semi-structured interviews with all the participants and classroom observation in all of the three schools. The use of the DSAS was evaluated in all of the three schools. It was found that all three teachers religiously used the DSAS in their classrooms. All participants had a positive attitude to the use of the DSAS and agreed that it gave the necessary support to the Grade 1 teachers. However, they regarded it as vital for all classes to have the DSAS, not only the FP. The acoustics of all the institutions of teaching and learning should be improved.

Chapter 6 presents the findings of the study and answers the research questions. It reports on the contribution of the study to the body of available literature, makes recommendations for future studies and points out the importance of reducing the background noise in the Foundation Phase. The implications and limitations of the study are also discussed in relation to the results in Chapter 5.

CHAPTER SIX

SUMMARY, FINDINGS, CONTRIBUTION TO KNOWLEDGE AND RECOMMENDATIONS

6.1 INTRODUCTION

Chapter 5 thematically presented data on the evaluation of the utilisation of the dynamic sound field amplified system (DSAS). The evaluation research methodology discussed in Chapter 3 was chosen for this study because of its ability to support the exploratory research. The evaluation methods included classroom observation, semi-structured one-on-one interviews with the teachers, class assistant, head of department (HOD), principals, speech and language pathologist and audiologists and learners on how they benefitted from the utilisation of the DSAS. Data analysis was led by my research focus and the relevant literature. The findings were presented as themes emerging from the data collected throughout the study.

In this chapter the results of the research will be verified in relation to how the background noise can be reduced in the Foundation Phase during the teaching of English First Additional Language. The recommendations of this study will be shared with the North West Department of Education (NWDoE). The implications and limitations of the study in relation to the results in Chapter 5 will be discussed. My contribution to knowledge and future research will be discussed in this chapter. This contribution and the silences in the available literature will be tabulated. I will present the discussions based on the steps of the evaluation study and the theoretical framework. The research questions will also be answered.This chapter ends with a postscript offering reflections on methodological learning that resulted from this intensely personal research experience.

6.2 OVERVIEW OF THE STUDY

This overview serves as a background to the synthesis of the findings and recommendations. The first five chapters of this research are summarised below.

Chapter 1

This chapter presented the background and the rationale of this study. It stated the main research question, namely: *How can DSAS improve acoustics in order to optimise the teaching and learning of EFAL in the Foundation Phase?* The conceptual framework, research methodology, data analysis and ethical measures of the study were also briefly discussed.

Chapter 2

The local and global literature on improved acoustics was consulted, focusing on the conduciveness of the classrooms and its effect on teaching and learning. It also looked into the importance of acoustics in teaching and learning EFAL.

Chapter 3

This chapter presented the theoretical framework as the foundation of my research study. An extensive review of literature in Chapter 2 assisted with the conceptual framework of DSAS and acoustics. The components of Programme Theory Evaluation (PTE) were examined. Chen's (1990) PTE is considered as the ideal and relevant theory for this study because of its simplicity as an evaluation model and its appropriateness to evaluate the DSAS. The development of Programme Theory Evaluation was discussed in detail.

Chapter 4

The chapter explains the research design, research site and sampling employed. The research methodology, the methods selected for data collection, the analysis and research quality were discussed as well as the ethical procedures and the role of the researcher

Chapter 5

In his chapter the data collected was discussed and sorted into themes and categories.

6.3 LITERATURE COMPLIANCE

In order to corroborate the findings, the existing literature was consulted and presented in Tables 6.2 and 6.3. Table 6.1 shows the results of the literature review in terms of supporting evidence. Table 6.2 lists the themes that emerged from the study and compares the findings with the existing knowledge. The literature consulted supports most of my findings. I also indicate silences in the literature. Lastly, new insights from my findings are discussed.

Table 6.1: Findings related to the existing knowledge

Author and year	**Existing knowledge**
Crandell & Smaldino (1999).	Absorptive materials on the ceilings and upper wall surfaces are effective.
Millet (2008)	Soft flooring reduces grinding and squealing caused by desks and chairs.
Millet (2008)	Introducing area rugs in early childhood environments might offer a more economical solution
Millet (2008)	With DSAS a minute or two are saved getting learners' attention or giving an instruction. A teacher does it only once instead of multiple times. In the course of a day, these minutes free up much time for instruction rather than classroom management.
Millet (2008)	The DSAS allows teachers to provide a better spoken English model to their learners, enabling them to hear the subtle phonological differences that result in differences in meaning.
Millet (2008)	The special schools referral rate can be reduced by installing DSAS in schools.

Author and year	Existing knowledge
De Souza (2012)	Classroom acoustics are important in education. Noise, reverberation and room modes typically interfere with the ability of listeners to understand speech.
Millet (2008)	The roving microphone increases learner interest and willingness to speak in front of the class. Shy and quiet learners are more willing to speak in front of the class using the roving microphone.

Analytical discussion of the documention following the evaluation study

Throughout this study the participants were informed about the process of the documenting the experiences following the evaluation process. Stage 1 covered the beginning, the needs assessment, Stage 2 the fact-finding and Stage 3 wrapped up the process.

The three Grade 1 teachers, their learners and the two district speech and language therapists and audiologists played a vital role in the study. The data could not have been collected without them.

In practice sometimes it is difficult to follow the evaluation process as stipulated in the integrated research process model (Fouché, 2012), but in this study it was easy. The summative approach was feasible because I evaluated the utilisation of the DSAS and gathered the outcomes from the participants. The summative evaluation programme assisted me to continuously measure the outcomes and evaluate the impact of the DSAS. This was done during the observations and the semi-structured interviews. The three stages of the life cycle guided me throughout the study.

Stage 1 of the cycle: Beginning (needs assessment)

What should be done to deal with noise levels in the classroom? Crandell and Smaldino (1999) mention that it is difficult to find a quiet classroom full of learners, as they are expected to participate actively when they are being taught. Strategies such as curtains etc. were mentioned in the literature and were already being used in the classrooms. The three schools all had rugs (although at Makgona the classroom was too small to use theirs), and curtains and other non-reverberating materials were used.

After the installation of the DSAS's I collaboratively with the two principals, the HOD and the 3 Grade 1 teachers to assess the needs of both the teachers and the learners in the classroom. All of the three schools had common suggestions on what should be evaluated and why there was a need for the impact of the DSAS to be evaluated; their schools had been supplied with the DSASs and it would be appropriate for the schools to see whether they benefited their learners and teachers. All three schools mentioned the challenges that teachers and learners were faced with.

The findings concerning the impact of the DSAS will be shared with the North West Department of Education, as this was a condition when I was given permission to work in the three schools.

Stage 2 of the cycle (fact finding)

At the beginning of this stage, observations and unstructured interview plans that we discussed previously were shared and agreed on with the participants. During this stage, I focused on monitoring the impact of the DSAS in the classrooms. Observation in the three classrooms showed me how the learners and teachers benefited from the DSAS. The interviews were also of great help for this study.

Millet (2008) argues that a minute or two is saved each time in getting learners to pay attention. In the course of a school day, this adds up. In this study all the teachers mentioned that with the DSAS they did not have to repeat themselves. This was necessary only at Swallows School, where there were two boys with specific learning barriers.

The DSAS helps teachers to produce clearer spoken English, which enabled learners to hear all the subtle phonological differences. All of the three teachers mentioned that with the DSAS their learners could hear well and distinguish the sounds well.

Stage 3 of the cycle (wrapping up)

This was the last and most important stage. The impact of the DSAS was monitored in the classrooms. This was the period where I managed to get the outcomes of the utilisation of the DSAS. The accessibility of the DSAS is crucial in all the junior classes. All learners must have access to roving microphone. Classroom acoustics must be such that learners are enabled to learn well. Noise and reverberation interfere with the ability of learners to understand speech (De Souza, 2012).

The three teachers appreciated the DSASs because they could speak softly without straining their voices and they were audible to all learners in the classrooms. The outcomes were positive, but less so in the case of two boys who had been diagnosed with specific learning barriers; nevertheless their teachers felt that they were better than before she started utilising the DSAS, because they were able to do more work before 10 am. The two boys, like all other learners in the three Grade 1 classrooms, enjoyed using the roving microphone. In particular, it increased the shy and soft spoken learners' willingness to speak in front of the class (Millet, 2008). The teachers also mentioned this.

Overall, the participants shared their sense of accomplishment and their learners' successes with me. (Millet, 2008) found that the special schools referral rate dropped after the installation of DSAS in his school districts, but this was not investigated in this study.

Table 6.2: Comparison of findings with existing knowledge: supporting evidence

Theme 1: Improved classroom communication			
Category 1	**Author and year**	**Existing knowledge**	**Research findings**
Interaction between the teacher and learners, between learners	Anderson (2004).	Classrooms are busy places and often noisy. Learners are often required to spend the better part of their day listening, yet under less than optimal acoustic conditions.	The DSAS helped learners in the 3 classrooms to be attentive and listen to the teachers.
	Millet (2008).	Noise can be a problem for everyone, but young learners with immature listening skills experience more difficulty than others due to temporary hearing loss from recurrent ear infections or auditory processing, language or learning disabilities.	Makgona School Grade 1 learners and their teacher had a serious problem when their DSAS was not charged and electricity went off.
	Millet (2008).	Young learners are less able than adults to listen and understand effectively in the presence of background noise.	Learners were able to follow instructions at all times.
	Massie, Theodoros, McPherson & Smaldino (2004).	Classroom interaction between the teacher and the learners can be increased in classroom interactions	The participation of learners was impressive at all times. There was never a time where learners were talking amongst themselves when the teachers addressed them. They were aware of their

Theme 1: Improved classroom communication			
			turns to speak.
Category 2	**Author and year**	**Existing knowledge**	**Research findings**
Reduction of noise	Schlitt, Souza & Strudwick (1999)	Classroom noise reduction includes covering bottom of chairs, desks and tables with tennis balls to keep them from sliding on the floor. Furthermore a teacher can choose a classroom away from external noise.	In this study the DSAS assisted to reduce the external and the internal noise.
	Schlitt, Souza & Strudwick (1999)	Keep windows and doors close. Place rubber strip around door to keep out noise.	In this study there were no rubber strips around the doors.
	Schlitt, Souza & Strudwick (1999)	Make rules for noise in the classroom, e.g. do not slam books down; sharpen pencils at certain times and no running and screaming in the classroom.	All the schools had class rules that were obeyed most of the time. But it was difficult to stop learners sharpening pencils whenever they needed to.
	Schlitt, Souza & Strudwick (1999)	Curtains can also be used to help reduce noise.	All the schools had curtains which prevented learners from being easily distracted by outside movements.
Category 3	**Author**	**Existing knowledge**	**Research findings**
Audible teacher and learners	Millet (2008).	The DSAS keeps the teacher's voice at a constant level, even when he/she turns away from the learners when writing on the chalkboard.	In this study, the teachers were audible to all the learners at all times.
	Millet (2008).	The roving microphone can	A roving microphone

Theme 1: Improved classroom communication			
		be available to learners, and learners are able to hear their peers more clearly.	enables learners to be assertive.

Theme 2 Effective teaching and learning with DSAS			
Category 1	**Author and year**	**Existing knowledge**	**Research findings**
Attentive Grade 1 learners in the classroom during the EFAL period	Vincenty-Luyando (2000).	DSASs have shown great benefits for learners learning English as a second language.	In this study I observed learners being attentive and enjoying the EFAL lessons.
	Millet (2008).	DSAS can produce improvements in English Second Language speech perception.	In all schools teachers informed me of the EFAL improvement in their classes.
	(Arnold & Canning, 1999; Prendergast, 2005).	Hearing children are also better able to discriminate words and spoken language more accurately with a DSAS than without.	This study focused on mainstream learners who can hear. However, their teachers still found improvement in children with barriers to learning.
Category 2	**Author and year**	**Existing knowledge**	**Research findings**
Increased EFAL performance of learners	Millet (2008)	Learners have a better ability to discriminate English Second Language words and spoken language more accurately with the use of a DSAS than without.	The teachers noted the significant improvement of their learners' reading and spelling ability**.**
	Massie & Dillon (2006b)	Second-language English learners need English language model with the focus not only on grammar and vocabulary, but also on individual	The teachers focused on teaching their learners English sounds. This helped the Afrikaans learners to hear and differentiate English and

Theme 2 Effective teaching and learning with DSAS			
		speech sounds and words, which must be acoustically clearer.	Afrikaans**.**

Theme 2 Effective teaching and learning utilising DSAS			
Category 3	**Author and year**	**Existing knowledge**	**Research findings**
Teachers	Wilson (1989).	The DSAS enables teachers to provide a better spoken English model to their learners, enabling them to hear the subtle phonological differences that result in differences in meaning.	In this study the EFAL performance, reading and spelling improved. Learners at Swallows could differentiate Afrikaans and English sounds**.**
Teachers' absenteeism because of ill health	Gotaas & Starr, (1993).	Teachers are at increased risk for vocal problems compared with people in other professions.	Teachers use voice a lot, especially in the junior classes**.**
	Jonsdottir (2002).	Most teachers reported throat discomfort prior the introduction of the DSAS.	In this study teachers who are using DSAS no longer suffer from sore throats.
	Millet (2008).	Generally teachers complained about vocal strain and overall fatigue.	A teacher at Makgona had some vocal strain.

Theme 3 Sub-standard infrastructure and its impact on the efficacy of the DSAS			
Category 1	**Author and year**	**Existing knowledge**	**Research findings**
Absence of policy on noise control	Crandell & Smaldino (1999).	The new ANSI standards recommend that the background noise level in an unoccupied room should not be more than 35 dBA. For most people 35 dBA is quiet.	Two teachers stated that there was no policy that deals with noise control. Only the principal of Makgona school mentioned that it was part of the Inclusive Education Policy**.**
Category 2	**Author and year**	**Existing knowledge**	**Research findings**
Sub-standard infrastructure compromises the efficacy of the system	Daily Maverick (2017).	Many schools still lack basic necessities (electricity, water, stocked computer centres, libraries and laboratories). A great number of schools still use pit latrines.	The building structures of the 3 schools are brick and mortar. They have electricity, water supply, computer centres, libraries and library corners in their classroom. Mooi School has the enrichment centre to give curriculum support to learners.

Theme 3 Sub-standard infrastructure and its impact on the efficacy of the DSAS			
Category 3	**Author and year**	**Existing knowledge**	**Research findings**
Burglary	Herald Live (2017).	Burglary is escalating at schools around South Africa. Vandalism has also been on the increase.	None of the schools experienced any burglary, but the schools have alarms and have insured all their valuables**.**
Category 4	**Author and year**	**Existing knowledge**	**Research findings**
Load shedding	Eskom (2015).	Load shedding is done countrywide as a controlled option to prevent a total blackout**.**	All schools experienced load shedding. Swallows and Mooi Schools' use of the DSAS was not affected because they charged their DSAS overnight.
Category 5	**Author and year**	**Existing knowledge**	**Research findings**
Classroom walls not noiseproof	Crandell & Smaldino (1999).	The United Kingdom has guidance on the acoustic design of schools since 1975; compliance is not a legal requirement.	None of the 3 schools have noiseproof walls.

Table 6.3 Comparison of findings with the existing knowledge across themes and categories

Trend in literature	**Author and year**	**Findings**
Improved acoustics are important to amplify the teacher's voice.	Millet (2008), Crandell. & Smaldino (1999).	During the observation the teachers' voices were amplified consistently at all times, even when there were external noises.
Improved acoustics are essential when teaching EFAL in the Foundation Phase.	Millet (2008), Crandell, & Smaldino (1999).	During the teaching of EFAL learners could hear the sounds clearly and they were able to differentiate them.
The DSAS makes the teacher audible to all learners in the classroom.	Millet (2008), Crandell, & Smaldino (1999).	In this study the teacher was audible to all learners irrespective of where they were sitting or which way the teacher was facing.
The use of the roving microphone is necessary in the classroom.	Millet (2008), Crandell, & Smaldino (1999).	The roving microphone was used to a limited extent, especially at Makgona because of the high number of learners in the classroom**.**

Table 6.3 compares the findings of the study with the existing knowledge across themes and categories. There are many similarities between the literature and the findings of the study: the DSAS amplifies the teacher's voice consistently and evenly throughout the classroom; the roving microphone is useful especially in large classes.

6.4 SUMMARY OF FINDINGS IN TERMS OF THE RESEARCH QUESTIONS

The discussion of the research findings is guided by the primary and secondary research questions as outlined in Chapter 1. All research findings are supported by discussions situated within the literature review and theoretical framework. The primary research question is:

> What are the teachers' experiences when using DSAS, teaching EFAL in the Foundation Phase?

To answer this question, I investigated the following secondary research questions:

- How can DSAS improve acoustics in the teaching and learning of EFAL in the Foundation Phase?
- *How do teachers make use of the DSAS in teaching EFAL in the Foundation Phase?*
- *How do learners respond to the use of the DSAS when learning EFAL?*
- What are the outcomes of utilising the DSAS system in the teaching and learning of EFAL in a Foundation Phase classroom?

6.4.1 What are the teachers' experiences when using DSAS teaching EFAL in the Foundation Phase?

Chapter Five, Section 5.5.1 explained that teachers are under a lot of pressure, because they understand the importance of correct pronunciation in EFAL and they need to be thorough**.** They must ensure that by the end of Grade 3 learners are able to read and spell. In Grade 4 English is used as a medium of instruction in most schools except in Afrikaans medium schools. Foundation Phase learners are not effective listeners. It gets worse when they are expected to listen in a noisy environment to a language that is not their home language (Nelson, Sacks & Hinckley, 2009). In the Foundation Phase learning takes place by listening and participating by means of communicating (Ramma, 2009).

The support that the learners got from home was a challenge to the teachers, because parents taught learners the names of the letters of the alphabet instead of sounds. This was now left to the teachers to correct.

6.4.2 How can DSAS improve acoustics in the teaching and learning in the Foundation Phase?

Originally the DSAS was only used for learners with hearing loss and fitted with hearing aids or cochlear implants. The DSAS amplifies the teacher's voice; therefore it was useful for learners with mild hearing loss (DiSarno, Schowalter & Grass, 2002). In this study the DSAS were used in all the mainstream 3 Grade 1 classes. I sat at the back of the classes in all my observations, and there was a consistent audible voice even at the back of the class; the teachers did not need to raise their voices.

I observed situations where there was a lot of movement and noise outside, yet learners where never unable to her the teacher. The volume of the teachers' voice always exceeded the internal and external background noise. It was easy for a teacher to give instructions to her class even if she was called to the principal's office.

I observed that in all three classes learners followed instructions and that it was easy for learners to listen to the teacher reading and comprehend the passage. Comprehension is the main aim of classroom instruction. At all times learners could hear their teachers, and that assisted them to differentiate the word sound distinctions of individual phonemes. The use of the DSAS benefited both the learners and the teachers in that regard, besides giving learners the confidence to stand up and read aloud – even learners who had small voices and were shy (see Chapter 5, Section 5.5.2).

6.4.3 How do teachers make use of the DSAS in teaching EFAL in a mainstream Foundation Phase class?

In this study only one Grade 1 class of Makgona School had a high number of learners. The DSAS facilitated not only the classroom management of assisted this class; all the classes benefited from its use. An audible teacher and the roving microphone put the teachers in control of their classrooms. Young learners perform better where there is a controlled teaching structure. Such a structure was observed in the 3 Grade 1 classrooms, and the teachers experienced less and less inappropriate behaviour.

6.4.4 How do learners respond to the use of the DSAS when learning EFAL?

The Grade 1 learners could hear a clearer English pronunciation from their teachers. During my observation the learners had an opportunity to hear their peers' pronunciation tusing microphones. Learners practised reading by listening to their own amplified voices.

The use of a microphone encouraged learners to volunteer to read out loud. All the teachers agreed that the fact that learners enjoyed reading helped them acquire good reading skills, and they were positive that by the end of the Foundation Phase their learners would be good readers and spellers of English.

6.4.5. What are the outcomes of utilising the DSAS system in the teaching and learning of EFAL in a Foundation Phase classroom?

The study found that the participants were not aware of the importance of acoustics in the classroom before DSAS was introduced. Stressful, unhealthy, frustrating and time consuming as it was, they did not have any choice. They had to speak at the top of their voices and often repeated themselves for their learners to hear and understand, and they had accepted the situation as it was.

The DSAS changed all that, improving the acoustics and thereby optimising the teaching and learning of EFAL in the Foundation Phase. The Grade 1 teachers mentioned that the dynamic amplification system assisted them to reach their learners with their different abilities.

6.5 THE THEORETICAL IMPLICATIONS OF THIS STUDY

The theoretical framework expounded in Chapter 3 was vital to guide this study. chen's (1990). Programme Theory Evaluation. This approach helped me to monitor the progress of a programme to achieve its objectives looking into the maximum use of the DSAS. I worked collaboratively with the three schools to develop a logic model. I assessed and assisted the formulation of goals and priorities together with the schools. My research followed the single linear causal path with focus on the five components or steps i.e. inputs, processes, outputs, outcomes and impacts (Chen, 1990). This was be done with attention to the context and the needs of three Grade 1 teachers and learners in the three schools in the North West Province in South Africa.

The evaluation approach aspired to understand what works for different schools. The district officials, the two principals, one head of department, the three Grade 1 teachers, the class assistant and the learners have alluded to the benefits of the DSAS in the classrooms in the interviews and during the observations. The study concentrated on evaluating the utilisation of the DSAS in the Grade 1 EFAL class and I took into account the different contexts of the three schools. The main reason for my study was dissemination of findings and enlightenment to focus on the practical interest to the beneficiaries, i.e. the Grade 1 teachers and learners.

More importantly to share the information with the senior management and policy makers of the North West Department of Basic Education to decide on budget allocation to benefit learners.

6.6 MY CONTRIBUTION TO KNOWLEDGE

The study focused on one aspect of evaluating the maximum utilisation of the DSAS in the Grade 1 classrooms. Documenting the teachers' experience was appropriate because it highlighted the evaluation approach, (DSAS) strengths and challenges of the use of the DSAS.

The use of the roving microphone is necessary in the classroom. The study highlighted the positive and negative of the use of the DSAS and the lack of enough microphones in the classroom. The utilisation of the DSAS was effective,

and it amplified the teacher's voice consistently at all times inside the classroom,even when there were external noises. The DSAS makes the teacher audible to all learners in the classroom.

In this study the teacher was audible to all learners irrespective of where they were sitting or which way the teacher was facing. Improved acoustics are essential when teaching EFAL in the Foundation Phase. During the teaching of EFAL learners could hear the sounds clearly and they were able to differentiate them. This study indicates that all three teacher participants and the learners of this study saw and benefitted on utilising the DSAS in the classroom.

Despite the fact that data of this research showed that there were benefits with the utilisation of the DSAS, it is however clear that this field is less explored in developing countries. It has been minimally explored in developed countries for learners with mild hearing loss. Thus, this study makes a contribution to the mainstream classrooms both in developed and developing countries.

6.7 RECOMMENDATIONS

I have formulated recommendations focusing on my main research question which looks into the role of acoustics in optimising EFAL learning and teaching in the Foundation Phase. The study makes a modest contribution to the understanding and appreciation of the importance of audible teachers in classrooms.

6.8.1 Recommendations to the North West Department of Basic Education (NWDE)

I found that the use of the DSAS improved the acoustics and optimised EFAL learning and teaching in the Foundation Phase. DSASs have been installed only in very few schools and in the Grade 1 classrooms only. The principals, the HOD and the Grade 1 teachers felt that DSAS were essential in all the classrooms.

I therefore recommend that the NWDE should support all Foundation Phase classrooms to improve their acoustics. Provision should especially be made for classes with large numbers of learners when the microphones are bought. The use of DSASs will assist with the early identification of learning barriers and

necessary interventions in schools, and may well reduce the number of learners who are referred to special schools because of poor performance.

Teachers' health, high rates of absenteeism and voice exhaustion will be reduced, and classroom management will be facilitated.

6.7.2 Recommendations for further study

This was an evaluation study of the use of the DSAS in the teaching and learning of EFAL in the Foundation Phase. The qualitative nature of this study brings new insight in this knowledge domain. The fact that I discovered that teachers are not certain about the fact that treating the background noise is embedded in any of the National Policies.

The following are ideas for further research:

- A baseline study that includes more Foundation Phase classrooms in the district should be conducted to get a broader picture of the external and internal background noise in the classrooms.
- A participatory action study that will focus on the learning, teaching and assessment in the Foundation Phase in the acoustically improved classrooms.
- A purposeful study which will document the positive impact of the results of how the audible class can benefit learner performance.
- Early identification and support of hearing-impaired learners with and without hearing aids by using the DSAS in the Foundation Phase.
- An evaluation that will focus on the language development and acquisition of Grade 3 learners who were in treated acoustic classes from Grade R.
- What happens when the DSAS is removed from a class?
- A longitudinal study of learners in higher classes, where the equipment is not used, who were taught with DSAS in the Foundation Phase.

6.8 LIMITATIONS OF THE STUDY

The fact that this was an evaluation study conducted in three schools in one district limited the scope of the study. The significant limitation was the small number of the participants. This study involved only three Grade 1 classes in three government schools. The results cannot be generalised to the whole of North West Province. To counteract this, a larger evaluation study would be needed. A wider and longitudinal study of the use of DSAS from Grade R to Grade 3 would suffice.

Another limitation is that the study only documented the observations and the responses of the participants. The schools did not have any support from the service provider to check if they were coping with the utilisation of the equipment.

One teacher informed me that my presence as a researcher made her uncomfortable; she felt that her English was not good enough. This was before our meeting with her, and before the principal explained the purpose and the processes of my study. She later understood that I was there as a researcher and became excited to have me in her class to see how the DSAS amplified her voice.

Of course, no amplification system can compensate for deficiencies in a teacher's skills. I observed no evidence of such deficiency, but the fact that this teacher felt unsure of herself did remind me that nothing can be achieved if a teacher is not competent..

My presence could also have made learners in the three schools act out of character just to get my and the teacher’s attention. I visited all three classes and explained to the learners about my visit and they were all happy and comfortable to have me in their classes as an observer.

I explained to them that it is important for them to be comfortable and that they should not feel intimidated when they were responding to questions and teaching.

6.9 CONCLUSION

The exploratory qualitative research that has been employed in this study by using evaluation gave insight from the schools about the impact of the utilisation of the DSAS. The fact that exploratory research gains insights to assist this study to be transferred other studies (Marlow, 2005). Not much has been written on the influence of improved acoustics on English First Additional Language teaching and learning in the Foundation Phase. The few studies that have been conducted have different contexts, with focus on special schools for learners with hearing loss. This study highlights the importance of the audibility of the teacher in the classrooms. However more needs to be done by way of research. Evaluation study on the utilisation of the DSAS has not been explored enough, there is an urgent need and the possiblity for this study to be conducted in more primary schools. The audibility in the classrooms has to be addressed in a concerted effort, with the North West Department of Education taking the lead.

POSTSCRIPT: METHODOLOGICAL REFLECTIONS

My research experience was exciting and interesting. I had a few challenges because of my work, and although my study followed the path outlined in the research design; there were occasions where adaptations had to be made to accommodate other participants.

In the beginning I had a schedule with detailed time frames in place. I had research questions and was aware of the fact that variables exist and my schedule might be affected.

However, I was fortunate that my schedule never changed much; the only interruption was a postponement because of my work commitments.

When I started with data collection, the participants were worried about the appearance of the classrooms and their learners. They wanted everything to be more perfect than normal, but after I my initial visit to the schools they got more relaxed and continued with their normal work.

One thing that astonished me was that all the schools were implementing the Inclusive Education Policy, but they were not certain whether dealing with background noise was part of the policy. While they were aware of and were actually implementing this policy, they did not know how and/or whether it could be linked with the matter of acoustics.

There were times when I felt they were derailing my process and my study. This happened during the interviews, where the teachers had a tendency of deviating and sharing their unhappiness with the teaching profession these days. I needed to be focused at all times and not get distracted by the frustrations and problems the teachers shared with me. Major frustrations mentioned were the load of administrative work and the lack of experience and passion of the education officials who were supposed to guide them, but never just wanted to listen to them and hear from them what works and what does not work for them. The other common challenge that was raised was the emphasis on teaching learners Mathematics in Setswana. Their argument was when they got to Grade 4, English

mathematical concepts are introduced. Learners struggle with figures and a language that could have been introduced in Grade R.

As a district official, I made a point of remembering that I was at those schools as a researcher and not as a mediator in the challenges that they were experiencing. I trod carefully so that they realised that while I listened to them because I did not want to upset them, I was not just another official who was not listening to their grievances. As a researcher it was important for me to remain neutral at all times.

The first time I entered the classrooms, I was not a stranger to the learners; they had seen me before, as it is part of my work to support schools in the district. However, it was the first time that I sat with them explaining to them what I would be doing in their classrooms. Most learners were excited at our first meeting, but it later changed when I started my observation. It did not take them long to accept me, they soon relaxed and a good rapport was established with me as a researcher. After few visits they got used to me and they actually competed to read to me.

From this study I learnt that an open mind is essential and that as a researcher one should always be ready to deal with unexpected situations. A research schedule should be flexible. When conducting qualitative research, avoid preconceived ideas about what to expect, as this will limit and alienate you from the research design.

The literature review served only as background information on previous studies; it did not give answers for all contexts. I gathered that before embarking on a study, as a novice researcher one should be familiar with the context and avoid all subtle variables that can afffect a study. Lastly, it is important to prepare and read enough to understand the context of the research beforehand.

LIST OF REFERENCES

Adams, T.F., Caddell, A.G. & Krutsinger, J.L. (2004). *Crime Investigation.* 2nd edition. Upper Saddle River, NJ: Pearson Education.

Adebanji, C.A. (2010). The educational and sociocultural challenges of immigrant students in a South African School. MEd. thesis. University of Pretoria. http://repository.up.ac.za/bitstream/handle/2263/24764/dissertation.pdf?sequence=1&isAllowed=y [Accessed 10 October, 2016].

Alexander, N. (2002). An ordinary country. Issues in the transition from apartheid to democracy in South Africa. Pietermaritzburg: University of Natal Press.

American Speech-Language-Hearing Association. (2005). (Central) auditory processing disorders. The role of the audiologist. [Position statement]. Available from http://.www.asha.org/policy

Anderson, K. (2004). The problem of classroom acoustics: The typical classroom soundscape is a barrier to learning. *Seminars in Hearing,* 25(3):117-129.

Anderson, K.L., Goldstein, H. (2004). Speech Perception Benefits of FM and Infrared Devices to Children With Hearing Aids in a Typical Classroom. *Language, Speech, and Hearing Services in Schools* 35:169-184.

Arnold, P. & Canning, D. (1999). Does classroom amplification aid comprehension? *British Journal of Audiology.* 33:171-178.

Babbie, E. (2013). *The practice of social research.* London: Wadsworth Cengage Learning.

Babbie, E. (2008). *The basics of social research.* New York. Thomson Wadsworth.

Babbie, E. & Mouton, J. (2001). *The practice of social research.* Cape Town. Oxford University Press.

Bakopoulos, D. (1997). English as universal academic language: Good or bad? The University Record. Retrieved December 15, 2015, from http://www.umich.edu/~urecord/9697/Jan28_97/artcl18.htm.

Benson, C. (2005). The importance of mother tongue-based schooling for educational quality. *Commissioned study for EFA Global Monitoring report*.

Beukes, A.M. (1992). Moedertaalonderrig in 'n demokratiese Suid-Afrika. *Per Linguam* (8):42-51.

Bickman,. L. (1987). The functions of programme theory. *New Directions for Evaluation,* 33:5-18.

Bogdan, R.C., & Biklen, S.K. (1982). *Qualitative research for education: An introduction to theory and methods.* Boston, Allyn, Bacon, Inc.

Bokaba, J.N. (2011). The development of the growth of a personal growth programme to address the emotional needs of Early Childhood Development practitioners in the previously disadvantaged communities. Unpublished Masters' dissertation Pretoria: University of Pretoria.

Boote, D.N., & Beile, P. (2005). Scholars Before Researchers: On the Centrality of the Dissertation Literature. *Educational Researcher* 6(34); ProQuest Psychology Journals.

Boothroyd, A. (2004). Hearing aid accessories for adults: The remote FM microphone. *Ear and hearing,* 2004 (pp 22-33). USA: Lippincott & Wilkins.

Brace, D. (2006). Classroom Acoustics and the benefits of sound field amplification. http://www.calypsosystems.com/images/uploads/research-studies/Benefits-of-Sound- Amplication.pdf

Brown, H.D. (1994). *Principles of language learning and teaching*. 3rd edition. San Francisco State University: Prentice Hall Regents, Inc.

Brutt-Griffler, J. (2005). World language, international language, and languages of wider communication. *The Encyclopedia of Language and Linguistics* (2nd ed.). St. Louis, MO: Elsevier Science.

Burnip, L. (1994). Hearing impairment phonological awareness, and the acoustic environment of the classroom. *Australian Journal of Remedial Education*, 26(1):4-10.

Campbell, D.T. (1984). Hospital and landsting as continuously monitoring social programmes: Advocacy and warning. In B. Cronholm & L. Von Knorring (eds.), *Evaluation of mental health service programmes* (pp. 13-39). Stockholm, Sweden: Forskningsraadet Medicinska.

Charmaz, K. (2000). Grounded Theory. Objectivist and constructivist methods. In N.K. Denzin & Y.S. Lincoln (eds.). *Handbook of qualitative research* (2nd ed.). (pp. 509-532) London: Sage Publications.

Chelius, L. (2004). Trost Amplification Study. Canby, Oregon: Canby School District. (Unpublished manuscript).

Chen, H.T. (2005). *Practical programme evaluation: Assessing and improving planning, implementation, and effectiveness*. Thousand Oaks, CA: Sage.

Chen, H. T. (1994). Theory-driven evaluation: Needs, difficulties and options. *Evaluation Practice* 15:79-82.

Chen, H. (1990). Theory driven evaluations: A comprehensive Perspective. Newbury Park, California: Sage.

Clark, M. (2007). A practical guide to quality interaction with children who have a hearing loss. United Kingdom: Plural Publishing.

Coad, J., & Lewis, A. (2004). Engaging Children and Young People in Research.*Review for the National Evaluation of the Children Fund* (NECF)

Cordray, D.S., & Pion, G.M. (2006). Treatment strength and integrity: Models and methods. In R. R. Bootzin & P. E. McKnight (eds.), *Strengthening research methodology: Psychological measurement and evaluation* (pp. 103-124). Washington, DC: American Psychological Association.

Coryn, C.L.S. (2009). Contemporary trends and movements in evaluation: Evidence-based, participatory and empowerment, and theory-driven evaluation. Paper presented at The Evaluation Center's Evaluation Café, Kalamazoo, MI.

Coryn. L.S., Noakes, L.A., Westine, C.D. & Schröter, DC. (2011). A systematic review of theory driven evaluation practice from 1990 to 2009*. American Journal of evaluation* 32(2)*:*199 – 226.

Crandell, C. & Smaldino, J. (2000). Classroom acoustics for children with normal hearing and hearing impairment*. Language, Speech and Hearing Services in Schools* 31(4):362-370.

Crandell, C. & Smaldino, J. (1999). An overview of sound field FM amplification: *The hearing review* 6(6):40-42.

Crandell, C. Smaldino, J. & Flexer, C. (1995). Sound field FM amplification: *Theory and practical applications*. pp 212 -213. San Diego: Singular Publishing Group.

Crystal, D. (2003). *English as a global language*. Cambridge University Press. UK.

Crystal, D. (2007). *English as a global language*. UK: Cambridge University Press.

Da Cruz A.D., Alves Silvério K.C., Da Costa A.R., Moret A.L., Lauris J.R., de Souza Jacob, R.T. (2016). Evaluating effectiveness of dynamic sound field system in the classroom. *Noise Health* (18):42-9 Down loaded from http://www.phonakpro.com/com/b2b/en/products/more_products/soundfield/dynamic soundfield.html

Daily Maverick (2017). http:// www.dailymaverick.co.za article

Dairi, B. (2000). Using sound field FM systems to improve literacy scores. *Advance for speech Language Pathologists and Audiology*, 12:59-66.

Davis, J. (1986). Remediation of hearing, speech and language deficits resulting from otitis media. In J. Kavanagh (ed.) *Otitis Media and Child Development.* York. PA: York Press.

DeBonis, D. (2015) It is time to rethink central auditory processing disorder protocols for school-aged children. *American Journal of Audiology* 24:124–136.

Denzin, N.K., & Lincoln, Y.S. (2005). Introduction: Entering the field of qualitative research. In N.K. Denzin & Y.S. Lincoln. (eds.). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Department of Education. (2014). *National Policy on Screening, Identification, Assessment and Support*. Pretoria: Government Printers.

Department of Basic Education. (2011). Curriculum and Assessment Policy Statement (CAPS). Foundation Phase. English First Additional Language Grade 1-3. Pretoria: Government Printers.

Department of Basic Education (2012). Education Statistics in South Africa 2010. Pretoria: Government Printers.

Department of Education (2004). National Norms and Standards for School Funding: Proposals for amendments. Pretoria: Government Printers.

Department of Basic Education (2001). Education White Paper 6: Special needs education: Building an inclusive education and training system. Pretoria: Department of Education.

Department of Basic Education (1996) South African Schools Act. Pretoria: Department of Education.

De Souza, l. (2012). *Critical Review: Do Personal FM Systems Improve Speech Perception Ability for Aided and/or Unaided Paediatric Listeners with Minimal to Mild, and/or Unilateral Hearing Loss?* University of Western Ontario: School of Communication Sciences and Disorders

De Vos, A.S & Strydom, H. (2012). Participatory action research. In A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delport (eds.). *Research at grass roots*: *For the social sciences and human service professions.* (pp. 491-506). 4th edition. Pretoria: Van Schaik Publisher.

De Witt M.W., Lessing A.C. & Dicker A (1998). The comparison of reading skills of non-mother tongue learners with those of mother tongue learners. *South African Journal of Education*, 18:118-123.

DiSarno, N.J., Schowalter, M. & Grassa, P. (2002). Classroom amplification to enhance student performance. *Teaching exceptional children* 34(6):20-26

Donaldson, S. I. (2007). *Programme theory-driven evaluation science.* New York, NY: Lawrence Erlbaum.

Donaldson, S.I., & Lipsey, M.W. (2006). Roles for theory in contemporary evaluation practice: Developing practical knowledge. In I. Shaw, J.C. Greene & M.M. Mark (eds.). *The handbook of evaluation: Policies, programmes, and practices* (pp. 56-75). London, UK: Sage.

Dowell, J. (1995). Trial of sound-field amplification system – its implications for Aboriginal and Torres Strait Islander people. *Proceedings of the Otitis Media NSW Conference 1995* Sydney: New South Wales Department of Health, New South Wales Department of School Education, New South Wales Board of Studies.

Earthman, G. (2002). School facility conditions and student academic achievement. UCLA's Institute for Democracy, Education and Access, viewed 4 March 2014, from https://escholarship.org/uc/item/5sw56439

Ebersöhn L., Eloff I. & Ferreira R. (2007). First steps in action research. In JG Maree (ed.). *First steps in research*. Pretoria: Van Schaik Publishers

Edwards, V. & Newcombe, L.P. (2006). Back to Basics: Benefits of bilingualism to parents. In: O. Garcia, T. Skutnabb-Kangas & M.E. Torres-Guzman (eds.). *Imagining and glocalization Great Britain* (137-149). Cromwell Press Ltd.

Egan, D. & Farley, S. (2004). The many opportunities of EFL training. *ProQuest Education Journals*, 58(1):54-61.

Elias, M.J. & Theron, L.C. (2012). Linking purpose and ethics in thesis writing: South African illustrations of an international perspective. In J.G. Maree (ed.). *Complete your thesis or dissertation successfully: practical guidelines* (pp.69 -80). Cape Town: Mills Litho.

Engelbrecht, P., & Green, L. (2007). *Responding to the challenges of Inclusive Education in Southern Africa.* Pretoria: Van Schaik Publishers.

Eskom, (2015). http://www.eskom.co.za Documents Eskom.

Fade, S. A. (2003). Communicating and judging the quality of qualitative research: the need for a new language. *Journal of Human Nutrition and Dietetics*, 16(3):139-149.

Ferreira, R. (2012). Writing a research proposal. In J. G. Maree (ed.), *Complete your thesis or dissertation successfully: practical guidelines* (pp. 27-39). Cape Town: Mills Litho.

Flexer, C. (2002) Rationale and use of sound field systems: An update. *The Hearing Journal*, 55(8):10-18.

Flexer, C. (1992). FM classroom public address systems. In M. Ross (Ed.), *FM auditory training systems: Characteristics, selection and use* (pp. 189-206).Timonium, MD: York Press.

Flexer, C. (1989). Turn on sound: An odyssey of sound field amplification. *Educational audiology Association newsletter*. 5:6-7

Flexer, C., & Long, S. (2004). Sound field amplification: Preliminary information regarding special education referrals. *Communication Disorders Quarterly*, 25(1): 29-34.

Flexer, C., Millin, J.P. & Brown, L. (1990) Children with developmental disabilities: the effect of sound field amplification on word identification. *Language, speech, and hearing services in schools* (21):177-182.

Fouché, C.B. (2012). Evaluation research. In A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delport (ed.). *Research at grass roots: For the social sciences and human service professions.* 4th edition. (pp. 449-472). Pretoria, Van Schaik Publishers.

Fouché, C.B. & Schurink, W. (2012). Qualitative research designs. In A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delport (eds.). *Research at grass roots*: *For the social sciences and human service professions.* 4th edition. (pp. 307-327). Pretoria: Van Schaik Publishers.

Funnell, S. & Rogers, P. (2011). *Purposeful programme theory:* Effective use of theories of change and logic models. San Francisco, CA: John Wiley & Sons.

Gelnett, D., Sumida, A., & Soli, S.D. (1994). The development of the Hearing in Noise Test for Children (HINT-C). Paper Presented at Annual Convention of the American Academy of Audiology, Richmond, VA.

Gonzalez, (2014). 12 ways to support ESL students in the mainstream classroom. http:www.cultofpedagogy.com

Gotaas, C. & Starr, C.D. (1993) Vocal fatigue among teachers. *Folia Phoniatrica et Logopaedica* (Basel), 45(3) :120 -130.

Gough, B. (2014). *Qualitative research in psychology*. Leeds Metropolitan University: Sage Publications Ltd.

Greeff, M. (2012). Information collection: interviewing. In A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delport (eds.). *Research at grass roots: For the social sciences and human service professions* 4th edition. (pp. 341-374.) Pretoria: Van Schaik Publishers.

Grin, F., Sfreddo, C. & Vaillancourt, F. (2010). *The Economics of the multilingual Workplace*. New York: Routledge

Gules, N. (2005). The struggle for English. *Sunday Times,* 9 January 2005.

Harcombe, E. (2003) Section 4: Implementing inclusive practice: Transformation of the curriculum. Course material. Topic – part 1. Inclusion: Development and learning support. Johannesburg: University of the Witwatersrand.

Henning, E., Van Rensburg, W. & Smits, B. (2004). *Finding your way in qualitative research*. Pretoria: Van Schaik Publishers.

Herald Live, (2017). http://www.heraldlive.com

Howard, D. (1994). Culturally responsive classrooms: A way to assist Aboriginal students with hearing loss in urban schools. In S. Harris & M. Malin (eds.), *Aboriginal kids in urban classrooms* (pp. 37-51). Darwin: Social Science Press.

http://www.acousticsfirst.com/eggc.htm [Accessed 16 June, 2014]

http://www.precuttennisballsforchairs.com. [Accessed 16 June, 2014].

International Labour Organization (2012). Right beginnings: Education and teachers in early childhood, Report on the debate in the global dialogue forum on the conditions of personnel in early childhood education. February 2012, Geneva.

James, C. (2011). Theory of change review: A report commissioned by Comic Relief.

Janesick, V.J. (2000). The choreography of qualitative research design: Minutes, improvisations and crystallization. In N.K. Denzin & Y.S. Lincoln (eds.). *Handbook of qualitative research.* 2nd edition. (pp. 379–400). Thousand Oaks: Sage Publications.

Johnson, C. (2000). Children's phoneme identification in reverberation and noise. *Journal of Speech, Language, and Hearing Research* 43:144–157.

Johnson, C.E. & Stein, R.L. (1997). "Minimal" High-Frequency Hearing Loss and School-Age Children: Speech Recognition in a Classroom. *Language, Speech, and Hearing in Schools,* 28:77-88.

Jonsdottir, V. (2002). Musicking in Early Intervention: Early Intervention as a Framework for Music Therapy with caretakers and their special-needs infants. Retrieved from: http://www.voices.no/mainussues/Voices2(2)jonsdottir.html.

Joubert, I., Bester, M. Meyer, E. & Evans, R. (2013). Theoretical introduction to language and literacy development. In I. Joubert. (ed). 2013. *Literacy in the Foundation Phase.(*pp. 1-21). Pretoria: Van Schaik Publishers.

Kawulich, B.B. (2005). Participant observation as a data collection method. *Forum: Qualitative Social Research Sozialforschung 6*(2).

Kearins, J. (1985). Cross-cultural misunderstandings in education. In J.B. Pride (ed.), *Cross-cultural encounters: Communication and miscommunication,* 65-79. Melbourne: River Seine Publications.

Kgosana, C., (2006). Moedertaal eerste? Liewer Engels, sê sommige swart ouers. *Rapport*, 19 February 2006. Retrieved 13 January 2016. www.ajol.info/../2076.

Kotze, H. and L. Hill (1997) Emergent migration policy in a democratic South Africa, *International Migration*, 35(1), 5-35.

Kowalczyk, D. (2015) Purposes of Research: Exploratory, Descriptive & Explanatory, http://www.education-portal.com/academy/lesson/purposes-of-research-exploratory-descriptiveexplanatory.html [Accessed 12 January, 2016].

Krashen, S.D (2002) Second Language Acquisition and Second Language Learning. University of Southern California: Pergamon Press Inc.

Lacey, A. & Luff, D. (2001). Trent Focus for research and development in Primary Health Care. *Qualitative data analysis*: Trent Focus.

Larsen J.B, & Blair, J.C. (2008). The effect of classroom amplification on the signal-to-noise ratio in classrooms while class is in session. Language, Speech and Hearing Sevices in Schools, (39):451-60.

Lemmer, E.M. (1995). Selected linguistic realities in South African schools: problems and prospects. *Educare*, 24:82-96.

Leung, S. & McPherson, B. (2006). Classrooms for learners with developmental disabilities: Sound-field and public address amplification systems compared. *International Journal of Disability, Development and Education* 53(3):287–299.

Lewis, D. (1994). Assistive Devices for Classroom Listening. *American Speech-Language-Hearing Association,* 70-83.

Lincoln, Y.S. & Guba, E.G. (2002). The only generalisation is: There is no generalisation. In R. Gomm, M. Hammersley & P. Foster (eds.). *Case study method* (pp. 27 – 44). London: Sage Publications.

Lolwana, P. (2004). The history of failing matric standards. Unpublished paper submitted for publication by HSRC.

Long, A. (2007). The effects of sound field amplification on reading achievement. *Action Research Exchange* 6(1). Downloaded from http://teach.valdosta.edu/are/abstracts_vol6no1.htm

Loots, M.C. (2011). Teachers' implementation of an asset-based intervention for school-based psychosocial support. Unpublished PhD thesis. Pretoria University: Pretoria.

Louw, W. (2009). Community based educational Programmes as support structure for adolescents within the context of the HIV/AIDS prevalence. Pretoria. University of Pretoria: PhD Thesis.

Lowell, A. (1993). Otitis media and classroom communication. *Australian Communication Quarterly*, 11-13.

Mackinnon, A., Amott, N. & McGarvey, C. (2006). Mapping Change: *Using a Theory of Change to Guide Planning and Evaluation.* Retrieved from www.grantcraft.org

Maree, K. (ed.). (2011). *Complete your thesis and dissertation successfully: Practical guidelines.* 1st edition. Claremont: Juta and Company Ltd.

Marlow, C.R. (2005). *Research methods for generalist social work*. New York: Thomson Brooks/Cole.

MARRS (2005). The Use of Sound Field Amplification of the Teacher's Voice in the Regular Education Classroom – A Summary of Studies.

Marshall, C. & Rossman, G.B. (1995). *Designing qualitative research*. University of Michigan: Sage publications.

Mason, J. (2002). *Qualitative researching*. 2nd edition. London: Sage Publications.

Massachusetts Department of Public Health Bureau of Environmental Health. (2003). *Indoor Air Quality Reassessment*. Retrieved March 30, 2016. Retrieved from http://www.mass.gov/portal/index.jsp?pageID=mg2searchlanding&sid=massgov2&query=tennis+balls+latex.

Massie, R. & Dillon, H. (2006). The Impact of Sound-Field Amplification in Mainstream Cross-Cultural Classrooms: Part 2 Teacher and Child Opinions. *Australian Journal of Education, 50*(1):78-94.

Massie, R., Theodoros, D., McPherson, B. & Smaldino, J. (2004). Sound-Field Amplification: Enhancing The Classroom Listening Environment for Aboriginal And Torres Strait Islander Children. *The Australian Journal Of Indigenous Education* (33).

Mayring, P. (2000). Qualitative content analysis. Forum: Qualitative social research. Retrieved from: http://qualitative-research.net/fqs/fqs-e/2-00inhalt-e.htm

McMillan, J.H., & Schumacher, S. (2006). *Research in education: Evidence-based inquiry*. 6th edition. United States of America: Pearson Education, Inc.

McMillan, J.H. & Schumacher, S. (2001). *Research in education: A conceptual introduction*. 5th edition. New York: Longman.

Mertens, D.M. (2005) Quality Criteria in Qualitative Research http://addingvalue.wceruw.org/Conferences/Meeting%205/Quality_Criteria_in_Qualitative_Research.pdf [Accessed 2 October, 2016].

Millet, P. (2008). *Sound field amplification research summary.* York University. (pp. 1-16).

Monette, D.R., Sullivan, T.J. & DeJong, C.R. (1990). *Applied Social Research: A tool for the human services*. 2nd edition. Philadelphia: Harcourt Brace Jovanovich College Publishers.

Mosheim, J. (2004) Sound field systems benefit teachers. *Advance for Speech, Language Pathologists and Audiologists*, pp. 13 -140.

Mouton, J. (2012). *How to succeed in your master's and doctoral studies. A South African guide and resource book.* Pretoria: Van Schaik.

Moyo, T. (2009). Linguistic Diversity and Development: The language Question and Social Justice in Southern Africa. University of Zululand. KwaZulu-Natal, South Africa.

Mulgan, G., Puttick, R. & Breakspear, S. (2014).From Good Intentions to Real Impact: *Rethinking the role of evidence in education businesses.*UK:Nesta. Retrieved from: www.nesta.org.uk

Nabelek, A. & Nabelek, I. (1994). Room acoustics and speech perception. In J. Katz (Ed.), *Handbook of clinical audiology* 4th edition. (pp. 624–637). Baltimore, MD: Williams & Wilkins.

Nation, I.S.P. & Newton, J. (2009). *Teaching ESL/EFL listening and speaking.* London: Routledge.

Nel, N.M. (2014) Second language difficulties in a South African context. In E. Landsberg, D. Kruger., & E. Swart (ed). *Addressing barriers to learning. A South African perspective* 2nd edition. (pp107-185). Pretoria, Van Schaik Publishers.

Nel, N.M. & Müller, H. (2010). The impact of teachers' limited English proficiency on English second language learners in South African schools. *South African Journal of Education* (30):4.

Nelson, P. (2000). Clinical forum: Improving acoustics in American schools. *Language, Speech and Hearing Services in Schools,* 31(4):354-355.

Nelson, P., Kohner, K., Sabur, S. & Shaw, D. (2004). Classroom noise and children learning through a second language: Double jeopardy? *Language, Speech and Hearing Services in Schools,* (36):219-229.

Nelson, P., Sacks, J. & Hinckley, J. (2009). Auralizing adult-child differences. Paper presented at the 157th Meeting of the Acoustical Society of America, Portland, OR.

Nelson, P.B. & Soli, S. (2000). Acoustical barriers to learning: Children at risk in every classroom. *Language, Speech and Hearing Services in Schools*, (31):356-361.

Nienhuys, T. (1994). Aboriginal conductive hearing loss for life. *Australian Language Matters*, *2*(1):8-9.

Nieuwenhuis, J. (2007) Introducing qualitative research. In K. Maree (ed.) *First steps in research* (pp. 44-68). Pretoria: Van Schaik

Northern, J.L., & Downs, M.P. (2002). *Hearing in children* 54th edition..Baltimore: Lippincott Williams and Wilkins.

Ntuli, E.Z. (2010). Early child care and development: The missing link, a challenge for Swaziland. Published Master's dissertation. Johannesburg. University of Witwatersrand.

Osborn, D. (2007). African Languages, Language Policy and Language use in South Africa: An uneasy marriage. Retrieved 4 November 2015 from: http://www.oulitnet.co.za/seminarroom/plea.asp

Page, S. (1995). Dual FM sound field amplification: A flexible integrated classroom amplification system for mild to moderate conductive hearing loss. *(Unpublished manuscript).*

Page, S., Hatfield, A. & Wallington, J. (1995). Sound-field amplification: Alternative technology for minimal hearing loss. In *Otitis media in childhood: Issues, consequences and management: Proceedings of the Western Australian Otitis Media Group conference* (pp. 338-334). Perth, WA: Western Australia Otitis Media Group Inc.

Patton, M.Q. (2002). *Qualitative research and evaluation methods*. 3rd edition. USA: Sage Publications.

Phonak Field Study News. (2011) Traditional or Dynamic Sound field -Which one gives better speech understanding in noise? Downloaded from http://www.phonakpro.com/com/b2b/en/elearning/publications/field_study_news.html

Pica, T. (2000). Tradition and transition in English language teaching methodology. *System 28* (1):1-18. USA: University of Pennsylvania Graduate School of Education.

Polat, S. & Buluş-Kırıkkaya, E. (2007), İlk ve ortaöğretim okullarındaki ses düzeyleri *Noise levels in primary and secondary schools*. İzolasyon Dergisi 66:78–82.

Prakash, S.G.R., Rangasayee, R., Jeethendra, P. (2011). Low Cost Assistive Noise Level Indicator for Facilitating the Learning Environment of School Going Children with Hearing Disability in Inclusive Educational Setup.. *Indian Journal of Science and Technology* (4):11.

Prendergast, S. (2005). Use of the California Consonant Test with children. *Journal of Educational Audiology* (12):67 -75.

Proffitt, M. (2013). Pocket Oxford English Dictionary 11th edition. UK: Oxford University Press Inc.

Prosovac, E.J., Carey, R.G. (1997). Programme Evaluation: Methods and Case Studies. 5th edition. (pp. 102-120). Upper Saddle River, NJ: Prentice Hall.

Pugh, K.C., Miura, C.A. & Asahara, L.L.Y. (2006). Noise Levels among First, Second, and Third Grade Elementary School Classrooms In Hawaii. *Journal of Educational Audiology* (13).

Ramma, L. (2009). Rethinking our classrooms: Assessment of background noise levels and reverberation in schools. *Education as Change* 11(2):115–130.

Ray, H. (1992). Summary of Mainstream Amplification Resource Room Study (MARRS) adoption data validated in 1992. Norris City, IL: Wabash and Ohio Special Education District.

Ready, D., Lee, V. & Welner, K. (2004). Educational equity and school structure: School size, overcrowding, and schools-within-schools. *Teachers College Record* 106(10):1989–2014.

Reynolds, A. J. (1998). Confirmatory programme evaluation: Applications to early childhood interventions. *Teachers College Record* 107:2401-2425.

Rogers, P, J. (2000). Programme theory: Not whether Programmes work but how they work. In D. L. Stufflebeam, G. F. Madaus, & Kellaghan, T. (eds.) *Evaluation*

models: viewpoints on educational and human services evaluation 2nd ed. (209-233). Boston, MA: Kluwer Academic Publishers.

Rogers, P.J. (2008). *Using programme theory to evaluate complicated and complex aspect of intervention*, 14(1):29-48. London: Sage Publications.

Rosenberg, C., Allen, L., Redmond, B., Phillip, J. & Stigers, K. (1995). Improving classroom acoustics, listening and learning with FM sound-field amplification. Poster presentation at the American Audiology Convention. Dallas. TX.

Rosenberg, C., & Blake-Rahter, P. (1995). Sound-field amplification: A review of the literature. *Sound-field FM amplification: Theory and practical applications* (pp. 107-123). San Diego, CA: Singular Publishing Group Inc.

Rossouw, D. (1999). Eerstetaalonderrig binne 'n paradigma van toegevoegde meertaligheid: 'n kontemporêre vraagstuk met historiese wortels. *Suid-Afrikaanse Tydskrif vir Hoër Onderwys*, 13:97-104.

Rubin, R., Aquino-Russell, C., & Flagg-Williams, J. (2007). Evaluating Sound Field Amplification Technology in New Brunswick Schools (pp 1-7).

Ryan, A. & Logue-Kennedy, M. (2013). Exploration of teachers' awareness and knowledge of (Central) Auditory Processing Disorder. *British Journal of Special Educational Needs* 28 (4):136-189.

Sackstein, S (2016). Education week: Teacher vs Teacher: Which are you? Downloaded:from www.edweek.org

Sapienza, C.M., Crandell, C.C. & Curtis, B. (1999) Effects of sound field frequency modulation amplification on reducing teachers' sound pressure level in the classroom*. Journal of Voice,* (3):375-381.

Sarinjeive D (1999). The mother-tongue, English and student aspirations and realities. *Journal for Language Teaching* (33):128-140.

Schrunik, W., Fouché, C.B. & De Vos, A.S. (2012). Qualitative data analysis and interpretation. In A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delport (eds.).

Research at grass roots: For the social sciences and human service professions 4th edition. (pp. 397-423). Van Schaik Publishers, Pretoria.

Schutz, R.T. (2005). Developmental deficits in social perception in autism: the role of the amygdala and fusiform face area. *Neuroscience Journal* (23):125–141.

Schlitt, P., Souza, A.P. & Strudwick, S. (1999) Information for Teachers of Students with Hearing Loss. Retrieved from: http://www.utdallas.edu/ ~thib/teachhl

Scriven, M. (1991). *Evaluation thesaurus*. 4th edition. Thousand Oaks, CA: Sage.

Seabi, J. (2012). Research designs and data collection techniques. In J.G. Maree (ed.). *Complete your thesis or dissertation successfully: practical guidelines* (pp. 81-93). Cape Town: Mills Litho.

Seale, C. (1999). *The quality of qualitative research*. London: Sage Publications.

Segen, J.C. (2015). *The dictionary of modern medicine*. Downloaded from www.modernmedicaldictionary.com

Sharpe, G. (2011). A review of programme theory and theory based evaluations: *American International Journal of Contemporary Research* (1):3.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information* 22:63-75.

Sherwood, J. & McConville, T.K. (1994). Otitis media and Aboriginal children: A handbook for teachers and communities. North Sydney: NSW Board of Studies.

Shield, B.M. & Dockrell, J.E. (2003). The Effects of Noise on Children at School: A Review. *Building Acoustics* 10(2):97-106.

Sidani, S., & Sechrest, L (1999). Putting programme theory into operation. *American Journal of Evaluation,* 20(2):227-238.

Silverman, D. (2000). *Doing quality research*. London: Sage Publications.

Smith, T., (1999). Outcome of Early Intervention for Children with Autism. *Clinical Psychology: Science and Practice,* 6:33-49. Washington State University.

Soli, S. & Sullivan, J. (1997). Factors affecting children's speech communication in classrooms. *Journal of the Acoustical Society of America,* 101, S3070

Stufflebeam, D.L. & Shinkfield, A.J. (2007). *Evaluation theory, models, and applications.* San Francisco, CA: Jossey-Bass Publications.

Strydom, H. (2012). Information collection: Participation observation. In A.S. de Vos, H. Strydom, C.B. Fouché & C.S.L. Delport (eds.). *Research at grass roots: For the social sciences and human service professions.* 4th edition. (pp. 328-340). Pretoria, Van Schaik Publishers, Pretoria.

Suchman, E. (1967). *Evaluative research*. New York, NY: Russell Sage Foundation.

Tamer-Bayazıt, N., Küçükçifçi, S. & Şan, B. (2011). Assessment of noise annoyance in elementary schools according to field studies. *ITU Journal Series A: Architecture, Planning, Design* 10(2):169–181.

Tharpe, A.M., & Bess, F.H. (1999). Minimal, Progressive, and Fluctuating Hearing Losses in Children: Characteristics, Identification, and Management. *Paediatric Clinics Of North America,* 46:65-78.

Thesaurus Dictionary, (2010).Downloaded from: http://www.thesaurus.com

Thomas, R.M. (2006). *Blending Qualitative and Quantitative Research Methods in Theses and Dissertations*. Thousand Oaks, California: Corwin Press, Inc..

Trochim,W.M.K. (2006). The Research Methods Knowledge Base: Qualitative Debate, Qualitative Validity. Retrieved from: http://www.socialresearchmethods.net/kb/qual.php

Trusted, J. (1987). *Moral principles as social values*. London: Potledge & Kegan Paul.

Van Es, M; Guijt, I. and Vogel, I (2015) Theory of change thinking in practice: a stepwise approach. Hivos. The Hague.

Van Parijs, P. (2010). Linguistic justice and the territorial imperative. *Critical Review of International and Social Political Philosophy* 13(1):181 – 201.

Vincenty-Luyando, M. (2000). The effect of noise and sound-field FM amplification upon the speech perception abilities of bilingual and monolingual students. PhD dissertation, The University of Connecticut.

Vogel. I. (2012) Review of the use of “theory of change” in international : Reviw report. Accessed from www.isabelvogel.co.uk

Von Gruenenwaldt, J.T. (1999). Achieving academic literacy in a second language: South Africa's educational predicament. *South African Journal of Higher Education*, (13):205-212.

Walvoord, B. & McCarthy, L.P. (2008) Thinking and writing in college: A naturalistic study for students in four disciplines. WAC Clearinghouse Landmark Publications in writing studies: http:wac.colostate.edu/books/thinkingwriting/ Originally published in print by the National Council of Teachers of English, Urbana, Illinois, 1990. [Accessed on 15 June 2014].

Weiss, C. (1998). Theory-Based Evaluation. Past, Present and Future. Paper presented at the American Evaluation Association Annual Meeting. Atlanta, Georgia, 8 November.

Weiss, C. (1997). Theory-Based Evaluation. Past, Present and Future. *New directions for evaluation,* 76:41-55.

West, L. (1994). Cultural behaviour, conflict and resolution. In S. Harris & M. Malin (eds.), *Aboriginal kids in urban classrooms* (pp. 7-19). Darwin: Social Science Press.

Wilson, O. (2002). Classroom Acoustics: A New Zealand Perspective. Retrieved 16 June 2014 from www.acousticsfirst.com/eggc.htm.

Wilson, R. (1989). The effect of sound field amplification paired with teacher training as an approach to language stimulation with Head Start children. PhD dissertation, University of Toledo.

W.K. Kellogg Foundation (2004). Logic model development guide. Battle Creek, MI: W.K. Kellogg Foundation. Available at www.wkkf.org/Pubs/Tools/Evaluation/Pub 3660.pdf [Accessed 16 October, 2013]

Wolf, D., Bixby, J., Glenn, J. & Gardner, H. (1991). *Review of research in education*. Sage Publishers. USA.

Young, D. (1995). The role and status of the first language in education in a multilingual society. In: K. Heugh, A. Siegrühn, A and P. Plüddemann (eds). *Multilingual Education in South Africa.* Johannesburg: Heinemann.

ANNEXURES

ANNEXURE A: PARTICIPANTS' PROFILES

ANNEXURE B: INTERVIEW SCHEDULES

ANNEXURE C: LETTERS OF CONSENT

ANNEXURE A

PARTICIPANTS' PROFILES

SOUTH AFRICAN MAP SHOWING THE NORTH WEST PROVINCE

Makgona School: Grade 1 classroom ***(with the DSAS)***

Swallows School: Grade 1 classroom ***(with the DSAS)***

Mooi School: Grade 1 Classroom ***(with the DSAS and the interactive white board)***

EVALUATION STUDY

The data collected in this study was guided by the research questions discussed in Chapter 4. The collection of data responded to all the research questions seeking to evaluate the utilisation of the dynamic sound field amplified system (DSAS). The study is guided by the evaluation research process model (Fouché, 2012); the process was discussed in detail in Chapter 4 *(Table 4.2).*

DATA COLLECTED

The names of the three schools in the study are fictitious. The schools were visited to discuss classroom observations and the unstructured interviews with the management, Grade 1 teacher. I also went to the classrooms to talk to the learners and to discuss my classroom observation and, more importantly, to build a rapport with the schools as a researcher. I also explained the assent forms to the learners.

1. Participants' profile

The learners' average age is 7 years. They have all attended Grade R classes. At Swallows and Makgona the Grade R class is attached to the school, but Mooi's Grade R is private, even though it is within the school's yard.

School	School management	No of learners in Grade 1.	Learners' language	Teachers' language (1 for each school)	1 class assistant	LoLT	Years of experience
Makgona	Principal	Boys: 32 Girls: 31 Total : 63	All Setswana	Setswana	Se- tswana	Se- tswana	36 02
Mooi	Principal	Boys: 14 Girls: 22 Total: 36	All Setswana	Afrikaans	None	English	20
Swallows	HOD	Boys: 13 Girls: 18 Total: 31	Afrikaans, Setswana and English	Afrikaans	None	Afri- kaans	34

Name of school	**Learners' hearing and other disabilities in the classrooms**	**Evidence of learners' performance and behaviour as observed by the researcher during the EFAL periods with acoustic apparatus.**
Makgona	3 boys diagnosed with mild hearing loss, 1 boy with visual impairment, 2 girls with specific learning disabilities in a Grade 1 class.	The 3 boys with mild hearing loss were able to hear the teacher. They participated in all the oral activities. 2 girls with specific learning disabilities followed instruction very well..
Mooi	2 boys have been indentified with learning disabilities in a Grade 1 class.	The 2 boys participated fully in the classroom as they were able to hear with the aid of the DSAS.
Swallows	1 boy and 1 girl were diagnosed with Attention Deficit Disorder (ADD), they cannot concentrate and pay attention in class, and they are on medication.	The boy was still a bit restless, but is attentive in the morning and completed his work before break. The teacher always had to call his name to get his attention. The girl followed instructions.

ANNEXURE B

INTERVIEW SCHEDULES

SEMI-STRUCTURED INTERVIEW SCHEDULE 1

GRADE 1 TEACHERS AND CLASS ASSISTANT

The purpose of this interview is to get the Grade 1 teachers' understanding of the policy provisions of the classroom acoustics, on how the background noise affects the teaching and learning, what are the benefits and the disadvantages of the DSAS.

INTERVIEW DATES_____

Gender:

_____

How long have you been teaching?

_____

What has been your previous professional experience?

_____

What are your qualifications?

_____

Is there a policy framework supporting the classroom background noise?

_____

_____

If there is one, what does it say? If there is none, what your view of this matter?

_____

_____

How does the background noise affect your EFAL teaching?

_____

_____

What are the benefits and the disadvantages of the DSAS?

Benefits

_____

_____

Disadvantage

_____

_____

How was teaching EFAL in Grade 1 like prior to the installation of the DSAS?

_____

_____

The purpose of this interview is to get the Grade 1 class assistant's understanding of the policy provisions of the classroom acoustics, on how the background noise affects her function as a class assistant of the Grade 1 learners in teaching and learning, what are the benefits and the disadvantages of the DSAS.

INTERVIEW DATES_____

CLASS ASSISTANT.

Gender:

_____

How long have you been a class assistant?

_____

What has been your previous experience with working with Grade 1 learners?

_____

What are your qualifications?

_____

Is there a policy framework supporting the classroom background noise?

_____

_____

If there is one, what does it say? If there is none, what your view of this matter?

_____

_____

How does the background noise affect your work as a class assistant?

_____

_____

What are the benefits and the disadvantages of the DSAS?

Benefits

_____

_____

Disadvantage

_____

_____

How was being a class assistant in Grade 1 during the EFAL period like prior to the installation of the DSAS?

_____

_____

SEMI-STRUCTURED INTERVIEW SCHEDULE 2

GRADE 1 LEARNERS

The purpose of this interview is to get the Grade 1 learners' understanding of the background noise in the classroom and to discuss the benefits and the disadvantages of the DSAS in the classroom.

INTERVIEW DATES: _____

What do you enjoy most in your English lessons?

_____

_____

Are you able to hear your teacher well?

_____

_____

What is it that you like about the DSAS?

_____

_____

What is it that you do not like about the DSAS?

_____

_____

SEMI-STRUCTURED INTERVIEW SCHEDULE 3

2 PRINCIPALS AND 1 HOD

The purpose of this interview is to get the understanding of the management on the policy provisions of the classroom acoustics, on how the background noise affects the teaching and learning, what are the benefits and the disadvantages of the DSAS.

INTERVIEW DATES: _____

Gender:

_____

Is there a policy framework supporting the classroom background noise?

_____

_____

If there is one, what does it say? If there is none, what is your view?

_____

_____

Let us talk about the background noise. How does it affect teaching?

_____

_____

The advantages of the DSAS

_____

_____

The disadvantage

_____

_____

How did Grade 1 EFAL teaching and learning take place prior to the installation of the DSAS?

_____

_____

SUMMARY OF THE NUMBERED TRANSCRIPTS

SCHOOLS	PARTICIPANTS	TRANSCRIPT NUMBER
Makgona	Teacher	1
	Class assistant	2
	Learners	3
	Principal	4
Mooi	Teacher	5
	Learners	6
	Principal	7
Swallows	Teacher	8
	Learners	9
	HOD	10

TRANSCRIPT 1

Makgona: Teacher

Gender: Female

How long have you been teaching?

36 years

What has been your previous professional experience?

I have been teaching the Foundation Phase (FP) for my entire teaching career. I started teaching Grade 1, 15 years ago.

What are your qualifications?

I have Bachelor of Education (BEd, FP).

Is there a policy framework supporting the classroom background noise?

I do not think that we have that policy. If there is one I am not aware of it.

If there is one what does it says, if there is none what your view on this matter is?

It is one area that has been neglected by the Department of Education. There is a need for that policy. The buildings of the schools should be in such a way that the background noise is reduced. The treating of the background noise is very crucial. I think that it should be prioritised for all the learners in schools more especially the young ones.

How does the background noise affect your EFAL teaching?

It is difficult for learners to hear and understand you in a class. You are expected to shout to be audible, and this can be exhausting, some learners get scared when you raise your voice to be heard by the whole class, they tend to think that you are angry. Often you have to repeat yourself over and over again, some classes in rural schools are big like my class. Learners are easily disrupted; they cannot pay attention if they cannot hear you.

This is more difficult in the teaching and learning of EFAL. Learners can hear the sounds well. English is new to them; if they cannot differentiate sounds at the Foundation Phase they will encounter difficulties in higher classes.

What are the benefits and the disadvantages of the DSAS?

Benefits

I do not have to scream when I teach my learners. My voice is equally audible to all learners.

It is easy to manage a huge class; my learners are calm, and more attentive. Even when I teach the new sounds I do not have to repeat it over and over again even for learners who are struggling. This has improved their performance and participation in the classroom.

This equipment is a life safer. All my learners can hear me and differentiate the sounds because they can hear them well. I can reach them all since I started this equipment. Shy learners and the ones with soft voices are also participating in class more especially when it is their turn with the microphone, they feel in control. They enjoy school because they can also be listened to and be heard by other learners when they use the microphone. My classroom is not as noisy and disruptive as before it is more manageable and I really enjoy teaching now. I do not have any problem with my throat, and I don't get too exhausted by the end of the day.

Disadvantage

It is not possible for us to charge our DSAS overnight, because the system has to be put safe in the strong room. There are days where there is no electricity and for that day we cannot use the DSAS. Only Grade 1 classroom has the DSAS, they should be in all classes, because the same learners with mild hearing loss will be going to those classes.

How was teaching EFAL in Grade 1 like prior the installation of the DSAS?

It was hard, even though my classes were never as big as it is now. Also EFAL as not introduced at that time; however the DSAS is necessary all the time in the

classroom. The difficulty was just getting the learners' attention, more especially if there was a louder noise outside.

Thank you

TRANSCRIPT 2

Makgona: Class Assistant.

Gender: Female

How long have you been a class assistant?

Two years.

What has been your previous experience with working with Grade 1 learners?

I do not have experience. I have children and my sisters' children that I took care of. I helped them with the homework. Before as unemployed mothers we were asked to remain with the Grade 1 learners when the teacher attends workshops and I knew that I can be a teacher. I then come to school to find out.

What are your qualifications?

Standard 10

Is there a policy framework supporting the classroom background noise?

I do not know if there is a policy.

If there is one what does it says, if there is none what your view on this matter is?

There is a need for that policy.

How does the background noise affect your work as a class assistant?

I always have to go around explaining what the teacher has said to some learners and moving between the desks here is difficult as you can see that there is no space, the class is overcrowded.

What are the benefits and the disadvantages of the DSAS?

Benefits

All learners can hear the teacher at the same time. I now get to assist the teacher with helping learners who are behind, issuing worksheets and any work that the teacher wants me to assist her with.

Disadvantage

I cannot think of any disadvantage.

How was being a class assistant in Grade 1 during the EFAL period like prior the installation of the DSAS?

Like I said I only started last of last year, and they had that equipment at time. I do not know how was it was for the teacher. Maybe she did not have so many learners in the class before.

Thank you

TRANSCRIPT 3

Makgona: Learners

What do you enjoy most in your English lessons?

The majority of learners in the class mentioned that they like it when they get a turn to use the microphone to speak, because all classmates listen. Learners mentioned that they participate in the Spelling Bee Competition.

Are you able to hear your teacher well?

They again mentioned that even though their class is still crowded they can now hear their teacher clearly, irrespective of where the teacher is standing. Some learners mentioned that their ability to learn to read quickly was because they could hear their well when she pronounced words.

What is it that you like about the DSAS?

The majority of learners mentioned that because they can hear and follow instructions clearly they are able to complete their work. This makes them enjoy the school.

DISADVANTAGE

Learners mentioned that because they are many, and it is difficult for them to get a turn to use the microphone.

Thank you

TRANSCRIPT 4

Interview dates: _____

Makgona: Principal

Gender: Female

Is there a policy framework supporting the classroom background noise?

No, there is no policy framework supporting the classroom background noise. However we do have the Inclusive Education Policy, it speaks about accommodating learners with different disabilities. I am thinking that we might not have a specific policy about the background noise, but the Inclusive Education Policy is supposed to accommodate the background noise challenge.

If there is one, what does it says, if there is none what your view is?

All what needs to happen is the National Inclusive Education Officials to assist schools to reduce the background noise.

Let us talk about the background noise, how does it affect teaching?

The classrooms are very noisy. It is difficult for a teacher to be audible to all learners.

It is difficult for us to control the noise outside the school, e.g. a truck that passes by. Getting learners' attention in that situation is difficult. Even after that noise has subsided it is a struggle to get their concentration.

The advantages of the DSAS

I appreciate the fact that my Grade 1 teacher's health is better. She does not complain with a sore throat anymore. The Grade 1 class is still huge but it more manageable since the use of the DSAS.

The disadvantage

We only have DSAS in the Grade 1 class and not have them in other classes; some of the learners' performance might deteriorate. It would be better if the whole Foundation Phase is catered for.

How was did Grade 1 EFAL teaching and learning take place prior the installation of the DSAS?

It was hard for the teacher. She did not have a big class and EFAL was not introduced. However her voice was always strained and she was on medication, she even thought of going on early retirement.

Thank you

TRANSCRIPT 4

Mooi: Teacher

Gender: Female

How long have you been teaching?

20 years

What has been your previous professional experience?

I started teaching in high school. I only started teaching Grade 1, 5 years ago.

What are your qualifications?

Primary Teacher's Diploma

Is there a policy framework supporting the classroom background noise?

No, I don't think so, because I have never heard about it.

If there is one what does it says, if there is none what your view on this matter is?

It is sad for the department never to think about that. These days we have many learners with specific learning problems in our societies.

How does the background noise affect your EFAL teaching?

Fortunately my class is not that big, but you will still struggle to get them to listen to you. They are easily disrupted, that is why we have curtains and desk dividers. Learners also take advantage of the background noise; they cannot speak softly to each other that make the whole class to be too noisy. You cannot give an instruction once; you always need to repeat yourself for them to ultimately follow you. It gets worse when you teach, you are never sure if they do not understand you or they cannot hear you properly.

What are the benefits and the disadvantages of the DSAS?

Benefits

DSAS has made me enjoy teaching again; I don't have to scream for learners to hear me.

I enjoy the device, even if I am called to the office, I can still give instruction to my learners. My learners are fascinated by that. All what I need to remember is to switch off the device when I go to the bathroom. All my learners including the two who are experiencing learning problems have improved in EFAL, and they can differentiate the sounds because they can hear them well.

My learners enjoy using microphone whenever they get an opportunity. Sometimes even if a learner is not confident and sits next to me reading, she or he feels like it is just the two of us they read much better. This improves their reading ability.

Disadvantages

I cannot think of any disadvantage.

How was teaching EFAL in Grade 1 like prior the installation of the DSAS?

It is difficult for me to say because I only started teaching this class last year and already the DSAS were installed already.

Thank you

TRANSCRIPT 6

Mooi: Learners

What do you enjoy most in your English lessons?

Learners mentioned that they get their spelling tests right most of the time. They are proud because they participate in the Spelling Bee Competitions, and they are doing very well. All learners stated that they are able to read, and they enjoy.

Are you able to hear your teacher well?

The majority of learners mentioned that they enjoy the school because their teacher does not get upset with them because they are attentive all the time. I repeated the question and looking at three learners who didn't respond with the rest of the group, they nodded.

What is it that you like about the DSAS?

One learner stated that she used to hate it because she has the smallest voice in the class and her classmates never listened to her before, now her voice is big like her classmates when she uses the microphone. All learners mentioned that they love it when they are given the microphone to read in the classroom.

Disadvantage

Learners mentioned that there is nothing that they hate about the DSAS. One learner mentioned that the fact that the teacher can still give instructions when she has been called to the principal's office.

Thank you

TRANSCRIPT 7

Mooi: Principal

Is there a policy framework supporting the classroom background noise?

There is no policy framework that precisely talks about the background noise. However the Inclusive Education Policy emphasised accommodating learners who need different level of support. Therefore ideally the classroom background noise is supposed to be catered for in the Inclusive Education Policy.

If there is one what does it says, if there is none what your view is?

It has never been raised by education officials, but sitting here I am convinced that it is in the Inclusive Education Policy. All what needs to happen is for the department to break it down, implement the policy and our problems will be over.

How does the background noise affect EFAL teaching?

This is a farm school. Previously it only catered for the farmers' children, and it was an Afrikaans medium school. The area is quiet not as noisy as it could have been in town or township. There is little noise that you will hear; mostly it is other learners and announcements which often can be disruptive for other learners.

The background noise can be a serious challenge more especially for the young learners. It is often difficult for a teacher to get their undivided attention. During the EFAL periods it can get difficult with the language that most of the learners do not even hear at home. So the background noise can be really stressful for both the teacher and the learners. Learners struggle to hear the teacher well and they confuse sounds. Teachers are stressed; they are always repeating themselves, and trying to be audible to all learners.

Advantages

The teacher and the Grade 1 learners enjoy school and their work. All learners can hear her well. She is in control of her class. There is an urgent need for all classrooms to be equipped with the DSAS.

What are the disadvantages of the DSAS?

Honestly the disadvantage that I can think of is not having these equipments in all the classrooms. I cannot think of any disadvantage, we actually need DSAS for all the classes.

How was did Grade 1 EFAL teaching and learning take place prior the installation of the DSAS?

The teacher who was here before resigned. She was stressed; she mentioned that she has lost interest in teaching.

Thank you

TRANSCRIPT 8

Swallows: Teacher

Gender: Female

How long have you been teaching?

34 years

What has been your previous professional experience?

I started my teaching career in the primary school. I have been teaching the Grades 1, 2 and 3. I have spent more years with the Grade 1 class.

What are your qualifications?

I have Primary Education Diploma

Is there a policy framework supporting the classroom background noise?

No, we do not have it; if we had it our union could have informed us.

If there is one what does it says, if there is none what your view on this matter is?

It is an over sight, hopefully the department will consider that, when they review policies.

How does the background noise affect your EFAL teaching?

We are in town noise of vehicles, motorbikes makes it difficult for my small learners to concentrate in class. Even with the curtains it is still difficult to reduce the background noise.

There are learners with learning barriers who find it difficult to understand in a noisy environment. Giving instructions and expecting them to follow them it's an unrealistic task.

What are the benefits and the disadvantages of the DSAS?

Benefits

The DSAS has made my work easy to work with my learners and those diagnosed with disabilities. My learners sometimes struggle to differentiate Afrikaans and English, However the DSAS assist the learners to hear the difference. Almost all learners in the classroom have the knowledge of sounds and their reading skills have been developed. One great advantage of the DSAS is that when an aeroplane passes, my voice automatically goes higher than the disrupting noise.

Disadvantage

We only have DSAS in the Grade 1 class and not have them in other classes; some of the learners' performance might deteriorate. It would be better if the whole Foundation Phase is catered for.

How was teaching EFAL in Grade 1 like prior the installation of the DSAS?

We did not have EFAL at that time, but it was difficult to be audible in a classroom. The outside noise can be sometimes unbearable. Teaching and learning was a challenge, learners were always distracted and it was not easy to get their attention

Thank you

TRANSCRIPT 9

Swallows: Learners

What do you enjoy most in your English lessons?

Most learners mentioned that their English speaking has improved; they can now communicate in English. They enjoy school, and they can differentiate English and Afrikaans.

Are you able to hear your teacher well?

“Our teacher is more audible since she started using the equipment”.

What is it that you like about the DSAS?

“I love it, more especially when I am given the microphone to read and speak in the classroom”. *(This was a general feeling of the whole class).* “It is now better in the class our two classmates who were always disturbing us and making our teacher angry in the classroom have stopped now”.

Disadvantage

None of the learners could remember any reason why they dislike the DSAS. *(They just shook their heads).*

Thank you

TRANSCRIPT 10

Swallows: HOD

Is there a policy framework supporting the classroom background noise?

There is no policy that talks about the background noise and how it should be treated.

If there is one what does it says, if there is none what your view is?

It is just disappointing that we do not have that policy. None of the officials understands how teachers struggle just to get learners to hear you.

Let us talk about the background noise, how does it affect EFAL teaching?

Our school is situated in town. There is a lot of noise, from planes, vehicles, motorbikes and loud music sometimes. All these make it difficult for our small learners to concentrate in class. Even with the curtains it is still difficult to reduce the background noise. The school is big, in addition to the noise outside, we so have a lot of noise within the school. Teaching is not that easy when you want learners to listen and sometimes you can't even hear yourself.

Advantages

Our Grade 1 teacher enjoys her work. All learners can hear her well. She is in control of her class. This device is supposed to be a must for all classrooms.

What are the disadvantages of the DSAS?

I cannot think of any disadvantage, we actually need DSAS for all the classes.

How was did Grade 1 EFAL teaching and learning take place prior the installation of the DSAS?

It was problematic more especially with the learners experiencing specific learning barriers.

Thank you

OBSERVATION 1

MAKGONA

Date: _____

Attendance:_____

Observational checklists

Activity (All the activities below are about the use of the dynamic sound field amplified system)	Number of times the teacher had to repeat herself to get the learners' attention	Attention of learners	Learners' participation	Number of times there was disruptive noise in and outside classroom
Greetings, thank you, may I, please	Not once	They were all attentive	They were all excited and wanted to use the microphone**.**	It was twice, and they were told that they wouldl not get a turn to use a microphone if they misbehaved**.**
Teaching English sounds	Twice, the teacher wanted to check if they had heard well.	They all listened	They all participated by saying sounds.	The only noise was when the Grade Rs were going to the bathroom. Fortunately they could not be distracted and the curtains stopped them from looking outside.
Reading, paired and individual	Not once	They all listened	They participated by listening to those who were reading.	There was no disruptive noise, some learners became restless when another learner had to start reading.
Spelling game	About three times, the class assistant helped**.**	Listened	They all participated	They were excited; it was a game, although they were learning.

OBSERVATION 2

MOOI

Date: _____

Attendance:_____

Observational checklist

Activity (All the activities below are about the use of the dynamic sound field amplified system)	Number of times the teacher had to repeat herself to get the learners' attention	Attention of learners	Learners' participation	Number of times there was disruptive noise in and outside classroom
Phonics	Twice	All learners were attentive	Learners participated by repeating the phonics.	There was no noise.
Reading	Never	They all listened to the teacher reading to them. They were also given an opportunity to read in pairs.	They participated by answering questions about the text that was read.	Nothing
Story telling about seasons and clothes.	The story was repeated.	They all listened and asked questions for clarity.	They participated by answering the questions.	There was noise outside the classroom; the gardener was mowing the lawn. Learners were not distracted**.**
Matched clothes with the seasons	Twice	They listened and followed instructions.	They worked in pairs.	There was no noise.

OBSERVATION 3

SWALLOWS

Date: _____

Attendance: _____

Observational checklist

Activity (All the activities below are about the use of the dynamic sound field amplified system)	Number of times the teacher had to repeat herself to get the learners attention	Attention of learners	Learners' participation	Number of times there was disruptive noise in and outside classroom
Days of the week: Read story about days of the week.	Once. However the teacher went back to the two boys to explain to them again.	Learners were attentive except just one boy who seemed restless all morning.	All, except one boy**.**	There were delivery trucks, cars and bikes moving up and down the road. Learners were not distracted.
Sounds	Twice	They were attentive.	They participated by repeating the sounds.	Vehicle noise outside the schoolyard.
Reading	Twice	They were attentive**.**	They read with the teacher and individually.	Vehicle noise outside the schoolyard.
Spelling card games	Three times	They were attentive	They all participated and enjoyed the game.	Vehicle noise outside the schoolyard.

ANNEXURE C

LETTERS OF CONSENT

ANNEXURE C

To : North West Department of Education
Head of Department

Attention: The Director
Department of Education
Bojanala District
Rustenburg

Date 26 August 2015

Dear Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH ATTHREE PRIMARY SCHOOLS

I am Mpho Marumo a registered PhD student at the University of Pretoria. I request permission to conduct research at the three primary schools in the Bojanala District. My topic is “Improving acoustics to optimise English First Additional Language teaching and learning in the Foundation Phase.”

The purpose of my study is to evaluate how improved acoustics can optimise EFAL teaching and learning in the Foundation Phase. The study will also document the use of the DSAS for teaching EFAL in three Grade 1 mainstream classrooms in North West. This will be done by discussing the teachers’ challenges as regards to the acoustics in their classrooms.

The classroom observations will afford me the opportunity to see how the learners react in the improved acoustic classroom. Lastly, the discussions with the teachers will enable me to hear how they feel about the optimal utilisation of the DSAS.

I will ensure that I observe ethical matters as pertaining to the observation of children and the interviews as stipulated by the Ethics committee of the University of Pretoria. Any ethical issues observed by the school will be discussed and will be upheld in the study. You are also assured of confidentiality, and participants will be treated with the utmost respect and dignity throughout the duration of the study. Pseudonyms will be used to protect the participant's identity. The participants will also be allowed to withdraw from the research at any stage.

I will be responsible to maintain the standards of professionalism in my role as a researcher.

Please note that all data generated will be stored in open repository of the University of Pretoria.

The information gathered at the three schools will be shared with the management of the North West Department of Basic Education. They will be in the position to study the results and assist schools accordingly.

Yours sincerely

_____

Ms. M.O. Marumo
Researcher

Email: m.marumo@webmail.co.za
Cell : 082 896 9774

Prof. N. C. Phatudi

Supervisor

Email: phatun1@unisa.ac.za

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UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education
Fakulteit Opvoedkunde
Lefapha la Thuto

To : The Area Manager
Circuit Manager
School Governing Body

Attention: The Principal
_____
_____
_____

Date :

Dear Sir/Madam

INVITATION TO PARTICIPATE IN A RESEARCH STUDY

I am Mpho Marumo a registered PhD student at the University of Pretoria. This letter serves an invitation for your school to participate in research to evaluate the impact of the dynamic sound field amplified system (DSAS) in the Grade 1 class in the teaching of English First Additional Language (EFAL).

The research entails the following:

(a) Semi-structured interviews. The interviewees will be the principal, the Foundation Phase H.O.D. and the Grade 1 teacher. Interviews will only take place during breaks or after school. The participants will, however, be given the opportunity to choose the time and the private place that will be conducive.

(b) Classroom observations.

My role as a researcher will be clearly separated from my position a district official. The research will be conducted during school hours. The management team will be assured that there will be no interruptions in the smooth running of the school.

It is important to sit with the school management team and the participant to discuss my detailed schedule; this will include the methods that will be used to collect data, that is, the use of a dictaphone and a reflective journal. The schedule will be flexible if there is a need to make changes, which will be discussed.

The ethical issues will be discussed with the school through consultation with the school management team. Adherence to ethical standards is crucial, and I promise to be open and honest at all times and to explain to the participants the purpose and the aim of the study. The rights of the participants will be thoroughly discussed and explained. They are assured of confidentiality, and they will be treated with the utmost respect and dignity throughout the duration of the study. Pseudonyms will be used to protect the participant's identity. The participant will be informed that she has the right to withdraw from the research at any stage.

I will be responsible to maintain the standards of professionalism in my role as a researcher.

Please note that all data generated will be stored in open repository of the University of Pretoria.

I am looking forward to working with you.

Kind regards

_____

Ms. M.O. Marumo
(Researcher)
Email: m.marumo@webmail.co.za
Cell : 082 896 9774

_____

Ass Prof. N. Phatudi

Supervisor

Email: phatun1@unisa.ac.za

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UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education
Fakulteit Opvoedkunde
Lefapha la Thuto

To: The Principal

_____

_____

_____

Attention: Grade 1 Teacher

Date:

Dear Sir/Madam

INVITATION TO PARTICIPATE IN A RESEARCH STUDY

I am Mpho Marumo a registered PhD student at the University of Pretoria. I would like to invite you and your learners to participate in my research to evaluate the impact of the dynamic sound field amplified system (DSAS) in the Grade 1 class in the teaching and learning of English First Additional Language (EFAL).

The research entails the following:
(a) Semi-structured interviews with you alone. The interviews will only take place during breaks or after school. It will be two interviews that will last for 30 minutes at a time. The participants will, however, be given the opportunity to choose the time and the private place that will be conducive.
(b) 2 Classroom observations, that will last for 30 minutes at a time. The purpose of the classroom observation is to see if they are able to hear you properly, by the way they participate.

My role as a researcher will be clearly separated from my position a district official. The research will be conducted during school hours. You are assured that there will be no interruptions in the smooth running of your daily teaching and learning activities.

The interviews and classroom schedule will be discussed. This will include the methods that will be used to collect data, that is, the use of a dictaphone and a

reflective journal. The schedule will be flexible if there is a need to make changes, which will be discussed.

I will ensure that I observe ethical matters as pertaining to the observation of children and the interviews as stipulated by the Ethics committee of the University of Pretoria. Any ethical issues observed by the school will be discussed and will be upheld in the study. You are also assured of confidentiality, and as a participant you will be treated with the utmost respect and dignity throughout the duration of the study. Pseudonyms will be used to protect the participant's identity. You will also be allowed to withdraw from the research at any stage.

I will be responsible to maintain the standards of professionalism in my role as a researcher.

Please note that all data generated will be stored in open repository of the University of Pretoria.

I am looking forward to working with you.
Kind regards

_____
Ms M.O. Marumo
(Researcher)

Email: m.marumo@webmail.co.za
Cell number: 082 896 9774

_____

Ass Prof. N. Phatudi

Supervisor

Email: phatun1@unisa.ac.za

Faculty of Education
Fakulteit Opvoedkunde
Lefapha la Thuto

To: The Grade 1 Teacher

_____

_____

Attention: The parents of the Grade 1 learners

_____

_____

Date:

Dear Sir/Madam

PERMISSION TO WORK WITH YOUR CHILD IN THE RESEARCH STUDY

I am Mpho Marumo a registered PhD student at the University of Pretoria. This letter serves as a request to get permission for your child to participate in the research to evaluate the impact of the dynamic sound field amplified system (DSAS) in the Grade 1 class in the teaching and learning of English First Additional Language (EFAL).

The research entails the following:

(a) Your child together will the other Grade 1's in his/her class will be expected to participate in a 30 minutes EFAL oral test in an informal manner.
(b) He/she together with the Grade 1's in his/her class will be observed in their classroom setting. 2 Classroom observations, that will last for 30 minutes at a time.

My role as a researcher will be clearly separated from my position a district official. The research will be conducted during school hours. The management team will be assured that there will be no interruptions in the smooth running of the school.

It is important to sit with the school management team and the Grade 1 teacher to discuss my detailed schedule; this will include the methods that will be used to

collect data, that is, the use of a dictaphone and a reflective journal. The schedule will be flexible if there is a need to make changes, which will be discussed.

The ethical issues will be discussed with the school through consultation with the school management team. Adherence to ethical standards is crucial, and I promise to be open and honest at all times and to explain to the participants the purpose and the aim of the study. The rights of the participants will be thoroughly discussed and explained. They are assured of confidentiality, and they will be treated with the utmost respect and dignity throughout the duration of the study. Pseudonyms will be used to protect the participant's identity. The participant will be informed that she has the right to withdraw from the research at any stage.

I will be responsible to maintain the standards of professionalism in my role as a researcher.

Please note that all data generated will be stored in open repository of the University of Pretoria.

I am looking forward to working with you.
Kind regards

_____
Ms. M.O. Marumo
(Researcher)
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ASSENT LETTER FOR LEARNERS:

Evaluating the impact of the dynamic sound field amplified system (DSAS) in the Grade 1 class in the teaching and learning of English First Additional Language (EFAL).

Dear Learner

My name is Mpho Marumo. I am an Education official at Tlhabane Resource Centre. I would like to speak to you about your class. I want to know whether you are able to hear your teacher well with the FM systems that are in your classroom, more especially during the English period.

I want you to write your name below to indicate whether you want me to speak to you. If you do not want, you are allowed to say so. If you agree, but during the interviews you decide not to continue, you are allowed to discontinue.

Make a big tick next to the first picture if you want to participate in the study. Make a big tick next to the second picture if you do not want to participate in the study.

YES☐ NO☐

Name and Surname:

_____

Grade: _____ Age :_____

_____
M.O. Marumo
Researcher

_____
N C Phatudi
Supervisor