An exploration of how Foundation Phase Mathematics and English can enhance teaching and learning through Music integration, according to the South African Curriculum.

by

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Abstract

Schools have to adjust to accommodate subjects that are 21st century appropriate in an already full curriculum. Educators feel overwhelmed and unequipped to handle all the expectations of the curriculum. Many are led to believe that Mathematics, Language and Music go hand in hand. There must be a more effective way to teach these three subjects, especially considering the biggest concern in education is always insufficient time. This study investigated the natural relationships between English, Mathematics and Life Skills in the Foundation Phase, to determine if true integration is viable. A document analysis was conducted to examine various curriculum documents including the National Curriculum, the National Protocol for Assessment Grade R – 3, and the CAPS document with the focus on Mathematics, English and Life Skills in the Foundation Phase. The findings include the potential for introducing integration of musical activities through similar topics as well as using various teaching and learning strategies that are able to construct deeper understanding. Considering the natural connections between subjects and themes, music activities can offer validity in the curriculum.

Keywords

Curriculum Assessment Policy Statements (CAPS): Education document and guideline set out by the Department of Education for all schools in the country.

English Home Language as a subject is divided into four sections; 1) Listening and Speaking; 2) Reading and Phonics, 3) Handwriting and 4) Writing. Listening and speaking skills are crucial for all subjects. Reading is divided into various components to assist with the learning and teaching of the skill; these include shared reading and shared writing; group guided reading; paired/independent reading; phonics. Phonics is also categorised into different sectors; phonemic awareness, word recognition (sight words and phonics); comprehension; vocabulary and fluency. The writing process that is followed in the CAPS document includes drafting, writing, editing and presenting text for others to read. The shared writing activities model the writing process so that children understand how individual letters form words, how separate words form sentences, the importance of spaces between words and the use of punctuation (DBE, 2011b).

Foundation Phase: grade R (register) to grade 3. During this phase of education, learners fundamental learning techniques as well as manners and ethics are developed.

Integration: Blending or combining two equal subjects to create a unified whole, to unite two subjects.

Mathematics according to the Education Department, is a language that uses notations and symbols for describing numerical, geometric and graphical relationships. It is an activity that involves observing, representing and investigating patterns and qualitative relationships in both physical and social phenomena and between mathematical objects themselves. Mathematics develops mental processes that enhance logical and critical thinking, accuracy and problem solving that contributes to decision making (DBE, 2011c).

Musical understanding: conceptualizing of music through performing, listening and creating (Wiggins, 2015).

Notes to the reader

There is a natural level of integration in all subjects, no subject stands alone not entirely anyway. While analysing the CAPS documents it was clear to see integration in its broader sense, particularly in the core subjects, Mathematics and English. According to the CAPS document, "the languages programme is integrated into all other subject areas" (Department of Education, [DBE]. (2011b). *Curriculum and Assessment Policy Statement Grades R-3 English.* Pretoria: Government Printing Works. 2011b, p8). This study is written from the perspective of a South African music specialist and aims to assist generalist educators with integrating music in English and Mathematics lessons.

APA 7th edition (2020) reference style was used in this dissertation.

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Chapter 1: Introduction

1.1 Background to the study

All learners should be encouraged to seize the power of education. “Education provides a foundation for learning throughout life” (Hallam & Papagerogi, 2016, p. 151) and goes far beyond the compulsory years of basic schooling. The influence of education is endless; it instils confidence, creates knowledge and open endless doors to numerous opportunities, such as critical thinking skills, better job opportunities and world-class citizens. Education also breaks down barriers to learning ranging from social to emotional factors which include peer pressure and how one interacts with peers, motivation to learning, self-confidence. Education has the ability to shape individuals’ beliefs, hobbies, career choices and even defines personal traits. It is everlasting, it has no end, it lives on. Education is holistic and this perspective should be implemented in all educators’ teaching style. I am a qualified music teacher and teach music from the Foundation Phase to Senior Phase at a private school in Gauteng, South Africa. My interest in integrating music activities with core subjects began when I started teaching music and drama in the Foundation Phase. From researching ideas for lesson plans and discussions with other educators, I realised that the learners enjoyed music and drama because of the informal manner in which the activities were presented. Learners moved freely around the classroom, singing songs, playing musical games, as well as being physically engaged with the content and their peers. One specific lesson stood out where spelling words in English was connected to acting and singing activities. During the lesson I noticed that because learners were actively engaged, they enjoyed every aspect of the lesson. This instigated my curiosity to explore integrating music learning experiences across the curricula and the benefits they possess, particularly for schools that do not have specialist educators. Integration, according to Snyder (2001, p.

37) occurs when “each discipline addresses the theme from its unique perspective”. When using integration as teaching method, the central theme needs to be addressed from each subject’s perspective. The unique perspectives of music enable the teacher to include music learning in other disciplines. Howard Gardner (1998) the father of the Multiple Intelligences Theory, believes that the theory is an explanation of human cognition in its entirety (Smith, 2002; Smith, 2008). He considers music to be “a privileged organizer of cognitive processes" (1998, p. 19). Gardner (2011) accentuates the importance of music intelligence or music learning experiences as it involves all the other intelligences such as verbal-linguistic; logical-mathematical; bodily-kinaesthetic; spatial-visual; and interpersonal intelligence. Gardner (2011) also advocates that learning experiences have a connection to particular intelligences and the way people develop skills and solve problems. Educators should be able to implement various learning and teaching methods in order for all children to have equal opportunities in learning. Educators need to have a good understanding of these methods to be able to identify barriers to learning and to include diversity in the classroom (Department of Education [DBE], 2011a). Being mindful of these obstacles will enable educators to provide equal opportunities to the best to their capabilities. There are variations in learning experiences which include various circumstances and educators need to discover how their method of teaching can benefit all learners.

In the South African Foundation Phase curriculum (Department of Education [DBE], 2011d) emphasis has been placed on Language and Mathematics as core subjects. In this phase, English is either the home language or the first additional language. Therefore, the focus in pre-service Foundation Phase teacher training, is on language and Mathematics. Music and the Arts are either not being taught or not enough time is allocated (Schoeman, 1994) for proficiency in these subjects. Barry (2008) mentions that not all educators feel confident

teaching these subjects due to lack of training. This is where curriculum development needs to be re-evaluated to include integration, especially at primary school level.

Music forms part of the Life Skills subject which focuses on a holistic growth in learners (DBE, 2011a, p. 8). Life Skills is divided into the following areas: Beginning Knowledge, Personal and Social Well-being, Creative Arts and Physical Education. Performing Arts, falls under the Creative Arts umbrella and provides the opportunity for learners to creatively communicate, dramatise, sing, make music, dance and explore movement. Performing Arts assists with physical skills development, creativity, stimulates memory, promotes relationships and builds self-confidence and self-discipline (DBE, 2011a). Performing Arts engages the brain, body and emotions in various ways which assists with physical development of both the fine motor and gross motor skills on another level. Through movement children are learning. The purpose of Creative Arts is to develop learners as creative, imaginative individuals, with an appreciation of the arts. Learners should be encouraged to use their imagination, explore and develop their creative ideas based on their personal experiences, using their senses, emotions and observations. Wiggins (2015) emphasises that from our experiences, we try to find meaning and then build understanding of our experiences. Gardner (2011) implies music is a powerful facilitator of cognitive development. The use of music as a learning aid is apparent in the Foundation phase. It is not just a means of learning but also helps organize other important knowledge; such as learning the alphabet; spelling; counting and building vocabulary. Life Skills is by nature an integrated subject as it focuses on the social, personal, intellectual, emotional and physical growth of learners (DBE, 2011a). This concept prompted me to investigate how musical understanding can be integrated into the teaching and learning of English and Mathematics. All learners should experience learning and understanding at its best by including music

activities into the core subjects, Mathematics and English. Authors (Campbell & Scott-Kassner, 2014) highlight the effectiveness of learning through music, which include enhances concentration, a positive learning environment, improved attention span and memory, multisensory learning, deepens the imagination and group work is promoted through the development of cooperation. Learners will have the benefits of both musical understanding and their relationships to these subjects if music activities are included in their learning experience. To ensure the integrity of each subject, learning objectives need to be identified for each area when planning the learning experiences (Snyder, 2001).

1.2 Rationale and problem statement

According to many curricula worldwide, particularly in America, Australia and South Africa, more time is allocated to teaching Languages and Mathematics and this is one of the reasons why they are considered core subjects. In the South African Foundation Phase curriculum, Language and Mathematics are taught separately. All other disciplines are condensed into one subject: Life Skills. Life Skills is introduced in the Foundation Phase and is divided into three larger subject areas; Beginning Knowledge, Personal and Social Well-being, Creative Arts and Physical Education. Life Skills follows a model of an integrated curriculum that provides the opportunity for learners to make connections across subjects, while also assisting the issue of teaching a large curriculum within a limited teaching time (Morris, 2003). Successful integration can serve as a time-saver for educators while creating a more meaningful approach for learners.

The majority of research covers Music and Mathematics integration and not necessarily Music and English integration, specifically focused on Foundation Phase. The research focus has mainly been on the benefits of integrating the two subjects and emphasis on the

importance of each subject being of equal value in the lesson. The gap in literature includes the link between languages and music and true integration between the subjects. True integration involves upholding the integrity of each subject area, only integrating themes when there is a strong natural relationship between the two subjects. The application of themes from one subject area to another is encouraged, which brings about deeper understanding and promotes critical thinking (Barry, 2008). (True integration is discussed in more detail in chapter 2 and 5.)

This study proposes to explore how Music can enhance teaching and learning in the Foundation Phase Mathematics and English. The outcome of this study should benefit generalist educators who are expected to teach music without enough training to create their own integrated learning activities.

1.3 Aim of the study and research question

The purpose of this document analysis research was to explore how teaching and learning in Foundation Phase Mathematics and English can be enhanced through music activities. These activities should also enrich musical understanding. The aim was to suggest ways of integrating musical knowledge through analysing the National Curriculum Statements for Foundation Phase Mathematics, English and Life Skills (which includes music). The primary research question of this inquiry is:

How can music integration enhance the teaching and learning of Foundation Phase Mathematics and English?

1.4 Research methodology

1.4.1 Research approach

Qualitative research is based on the belief that knowledge is built by people in an ongoing manner as they engage in making meaning of an experience. Qualitative studies focus on how people interpret their experiences, how they construct their worlds, and the meaning they place on their experiences (Merriam & Tisdell, 2016). Merriam and Tisdell (2016) explain the following four characteristics that are most common to the nature of qualitative research: the focus is on the inductive process; the understanding and meaning; the researcher acting as the main instrument of data collection, and analysis to create a descriptive product.

My research supported a qualitative research approach. I focused on the inductive process and (i) gathered data from both literature and National Curriculum documents to (ii) build concepts that (iii) outline the process of making meaning, (iv) the integration of musical knowledge into the learning and teaching of Mathematics and English in the Foundation Phase. As the researcher, I was the main instrument in gathering data, and interpreted the integration of musical knowledge in order to create teaching activities suitable for the Foundation Phase classroom.

1.4.2. Research design

Document analysis is a qualitative research design that makes use of an orderly process for reviewing and assessing documents (Bowen, 2009). This study used documents as the main data source to conceptualize, comprehend and provide application through understanding by examining and interpreting data. The researcher relied on interpretation and description of the data from documents instead of using raw data for analysis (Bowen,

2009). Analysis of the following documents were included: the CAPS documents for English, Mathematics and Life Skills; and the National Curriculum Statement Grade R – 3 as well as other literature pertaining to the topic. For this study, the researcher determined the purpose and context of these documents, in order to ensure that the analysis process was as transparent as possible (Bowen, 2009).

This study included a close reading of the documents, an understanding of the ways in which they were written, produced, used and consumed. This analysis is a way of understanding social practice (Coffey, 2014), which applies to the learning experience as the activity.

1.4.3. Data Collection Techniques

Data collection took the form of documentary research. Documentary research is the process of using documents as a means of investigation which explores the records created either by individuals or organisations (Gibson & Brown, 2009). For this research, the documents that were studied intensively for data collection included the National Curriculum, the National Protocol for Assessment Grade R – 3, and the CAPS documents with the focus on Foundation Phase Mathematics and English, and Music in Life Skills. These documents are in the public domain and are easily accessible online. The above-mentioned documents include the expected outcomes outlined by the Department of Education and were used as a primary source of data.

Analysis should be viewed with data collection as a basic feature (Gibson & Brown, 2009). The analysis of the CAPS documents considered the context of the curricula. The documents were viewed as a guideline of the expectations instead of as concrete evidence. According to Coffey (2014), this understanding suggests a reflective manner in how we should treat the documents as social data. The data collected from the CAPS documents provided

descriptions, that offered understanding, and a clear outline (Merriam & Tisdell, 2016) that lead to the analysis process.

1.4.4. Data Analysis and Interpretation

The data for analysis in this research comprised prescribed South African curriculum documents. Documents provide a means for comprehending and making sense of both organisation and social practices (Coffey, 2014). After reading the documents in terms of their content meaning, I indexed and coded the data to identify key topics across subjects. From the analysis process of each grade in the Foundation Phase CAPS documents, the expected learning outcomes were highlighted to explore music integration learning experiences. This was completed through comparison, researching different teaching strategies and analysing the expected outcomes. Successful music integration allows for music and the other subject to connect naturally. Integration is about both subjects being treated equally and being at the centre of the lesson (Snyder, 2001).

The data analysis process focused on finding themes, topics, learning outcomes and natural connections between the subjects to determine if integration is viable. The findings enabled me to recommend ways of integrating musical understanding that is in line with the South African National Standards for each year group in the Foundation Phase. These recommendations were based on the Curriculum Assessment Policy document set out by the Department of Education.

1.5 Trustworthiness of The Research

Merriam & Tisdell (2016) refer to triangulation for trustworthiness of research. Triangulation makes use of many sources of data where it is compared and cross-checked through either observation at different places or times, different perspectives or comparing

multiple theories. Triangulation is a strong strategy for validating the reliability of research. Researcher triangulation refers to documents or articles written by various authors (Flick, 2004). In this study, the researcher applied research triangulation cross checking the appropriate data within different CAPS document

1.6 Ethical Considerations

The proposed open access documents are in the public domain and therefore already available. The author followed the ethical procedure of Pretoria University and ethical clearance was granted and the ethics number is HUM025/1219. No participants were involved in this study.

1.7 Value of The Study

The findings of this study should enable the researcher to offer learning and teaching ideas through music integration in English and Mathematics to assist inexperienced general educators. Suggestions for curriculum development for generalist educators and how true integration can enhance the curriculum was included. Integration also offers another option of interpreting the CAPS document.

1.8 Scope of Study

This study includes analysis of the three CAPS documents set out by The Department of Education, and the guidelines for inclusive teaching and learning, focusing on the learning outcomes, recommended activities and suggestions on how to integrate music activities. Outcomes from the curriculum have been analysed to highlight opportunities for integration and themes have been identified from English and Mathematics. Literature will be scrutinized and compared to the CAPS documents.

1.9 Chapter Overview

The introduction and background to this document analysis exploratory study are discussed in Chapter 1. The literature review in Chapter 2 explains various ideas of arts integration, different ways of viewing arts education as well as several models of integration used in the classroom. This chapter discusses the situation in not only South African schools but also refers to the research conducted in first world countries such as Australia and America. Successful research (Russell-Bowie,2006; Bainger, 2010; Colwell and Berke, 2004; Gilbert, 2016) focusing on music integration has been conducted in Australia and America and supports strong evidence for this method of teaching.

It also explores the benefits of music integration and reviews the CAPS document focusing on English, Mathematics and Musical understanding (DBE, 2011a) and lesson plans. In Chapter 3 this qualitative document research design, approach, research methods and data analysis strategies are explained and how they will be studied to find the opportunities for music integration. In Chapter 4 the data analysis process, outcomes and emergent themes are introduced. Chapter 5 exhibits how the comprehensive literature study has complemented the research experiences and new literature in order to strengthen the outcome of this study and ends with the conclusion. The thematic discussion and suggested opportunities for further research are presented in Chapter 6.

Chapter 2: Literature review

2.1 Introduction

The focus of this research is on assisting inexperienced educators in teaching music to integrate musical knowledge into Mathematics and English in, government-run schools in Gauteng, South Africa. Literature that promotes intentional music integration into the lesson is increasing. “Music can support learning in language and mathematics as well as acquisition of cognitive, social, physical and emotional skills” (O’Keefe et al., 2016, p. 13). The following section is organized thematically to highlight common ideas and relationships between authors’ work. The sections will discuss models of integration in the classroom, the influence of lack of teacher training and curriculum development in some South African, American and Australian schools, Curriculum design and lesson planning, and Curriculum Assessment Policy Statements (CAPS).

2.2 Arts integration

Arts integration is not a new research area and is described by a number of different authors. Silverstein and Layne (2010) define arts integration as an approach to teaching in which learners construct and demonstrate understanding through an art form. Learners engage in a creative process which connects an art form and another subject area and meets objectives in both (Silverstein and Layne, 2010, p.1).

Arts integration as defined by LaJevic is “a dynamic process of merging art with (an)other discipline(s) in an attempt to open up a space of inclusiveness in teaching, learning and experiencing” (2013, p.2). Integration has been highlighted as an approach that is rooted in everyday teaching (LaJevic, 2013). Davies (1999) argues that integration in multidisciplinary fields and works is essential to assist learners in developing learners into well-rounded

persons. Education has changed from remembering facts to the understanding, application, as well as research, analysis, synthesis, evaluation, problem solving, critical thinking and leadership skills (Mayer, 1992; Russell-Bowie, 2009b). Barrett (2001) exemplifies how an integrated approach to music education aligns learners' natural inclination to want to understand their experience and to create new knowledge from prior experiences. Connections to musical works should complement the subjects and lead to musical growth and understanding (Barrett, 2001). General educators of the 21st century are more likely to support music integration as they believe it adds value in teaching strategies, learner engagement, as well as overall performance. Hence the need to equip educators with the necessary skills, as well as providing a 'music-infused' interdisciplinary curriculum, to enhance both music and learning (Scripp & Gilbert, 2016; Mishook & Kornhaber, 2006). As with any successful method, authenticity is required. Music needs to be taught with musical understanding to enhance the cognitive and creative skills learners require to "discover and express meaning as they build a deeper understanding of the natural connections" between subjects that transpires in "high-quality music integration teaching and learning" (Scripp & Gilbert, 2016, p. 188). Arts integration is able to enhance both the learning and teaching experience as long as the natural connection between subjects is highlighted.

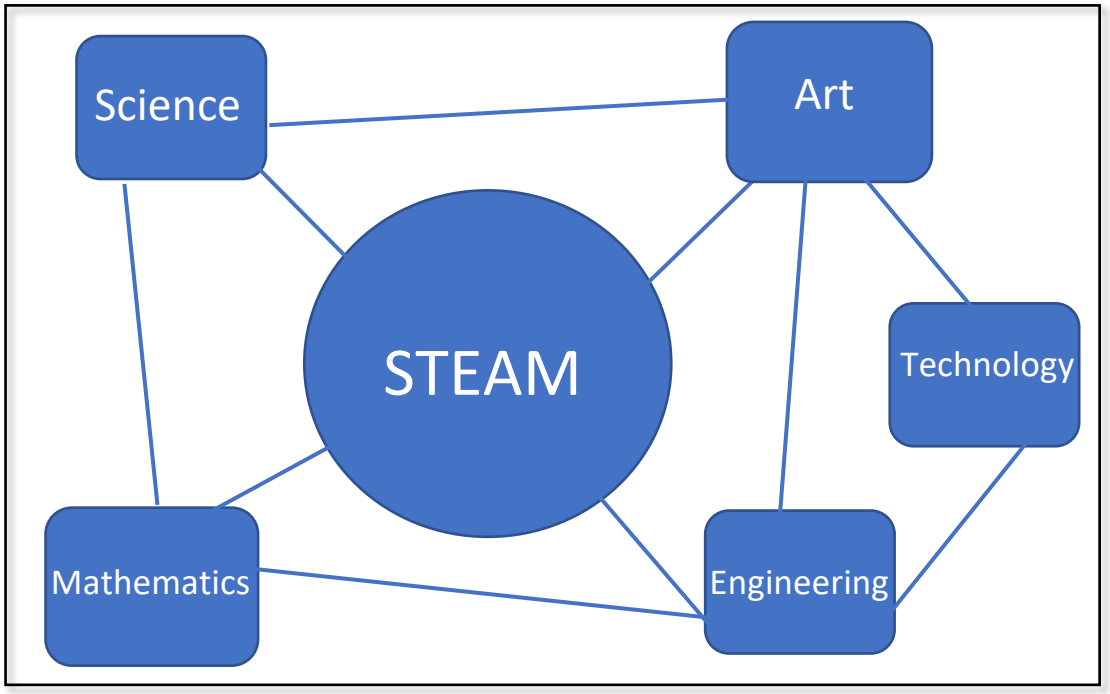
2.2.1 Arts integration and the multiple intelligences theory

Gardner's (1993) theory of multiple intelligences propose eight ways in which the human brain processes new information. Individuals generally process the world through one or more of these intelligences and the way they learn might include more than one of these domains. As an example of including the multiple intelligences in teaching and learning, Russell-Bowie (2006) proposes an approach to ensure that all learners are given

the best opportunity to holistic learning: **logical and mathematical intelligence** relate to the reading and writing of music; **bodily-kinaesthetic and spatial intelligences** pertain to moving to music; **naturalistic intelligence** ascribe seeing patterns and creating music using nature as an incentive; **interpersonal and verbal-linguistic intelligences** can describe working together in groups, and playing in an ensemble; individual practising and composing, showing emotions through music and individual reflection on music develops **intrapersonal intelligence**; and **musical intelligence** is developed through creating, performing and appreciating music (Russell-Bowie, 2006). Research shows that learning through the arts can be an effective method of deeper understanding in mathematics and language (Fiske, 1999; Russell-Bowie, 2009b) and that authentically integrating subjects across the curriculum can ensure meaningful and effective learning experiences (Anderson & Lawrence, 2001). In order for subjects to be authentically integrated, there needs to be a natural and genuine association between the subjects. A project that developed recently to apply integration across the curriculum is STEM. STEM education was geared to increase the number of learners specializing in the fields of Science, Technology, Engineering and Mathematics. The curriculum is grounded on the concept of educating in four specific disciplines and was introduced in 2001 by scientific administrators at the U.S. National Science Foundation (Liao, 2016). John Maeda, former president of the Rhode Island School of Design, supported the change from STEM to STEAM, campaigning to add “arts” to STEM. He shared his point of view that the arts are essential to linking the disciplines of STEM with educational policymakers. The subject supports design thinking and creativity which are important elements for innovation (Liao, 2016). Arts education expands our understanding of the world around us (Clapp and Edwards, 2013) and encourages integration of themes from the different disciplines (Snyder, 2001). STEAM education draws across the different

disciplines (Figure 2.1) and subsequently evolved into STEAMD (Science, Technology, Engineering, Arts, Mathematics, and Design) which demonstrates the importance of arts integration (Makeblock, 2019).

Figure 2.1: *Visual representation of STEAM education* (Liao, 2016)



Both arts integration and STEAM(D) can help prepare learners for the working world (Davies, 1999; Mishook, J.L. & Kornhaber, M.L., 2006). Although, according to LaJevic (2013), arts integration is more suited to incorporate music as an art form than STEAM(D) education. In arts integration, music as the art form is part of the creative process, where in STEAM(D) education, music can only be incorporated in a project-based form.

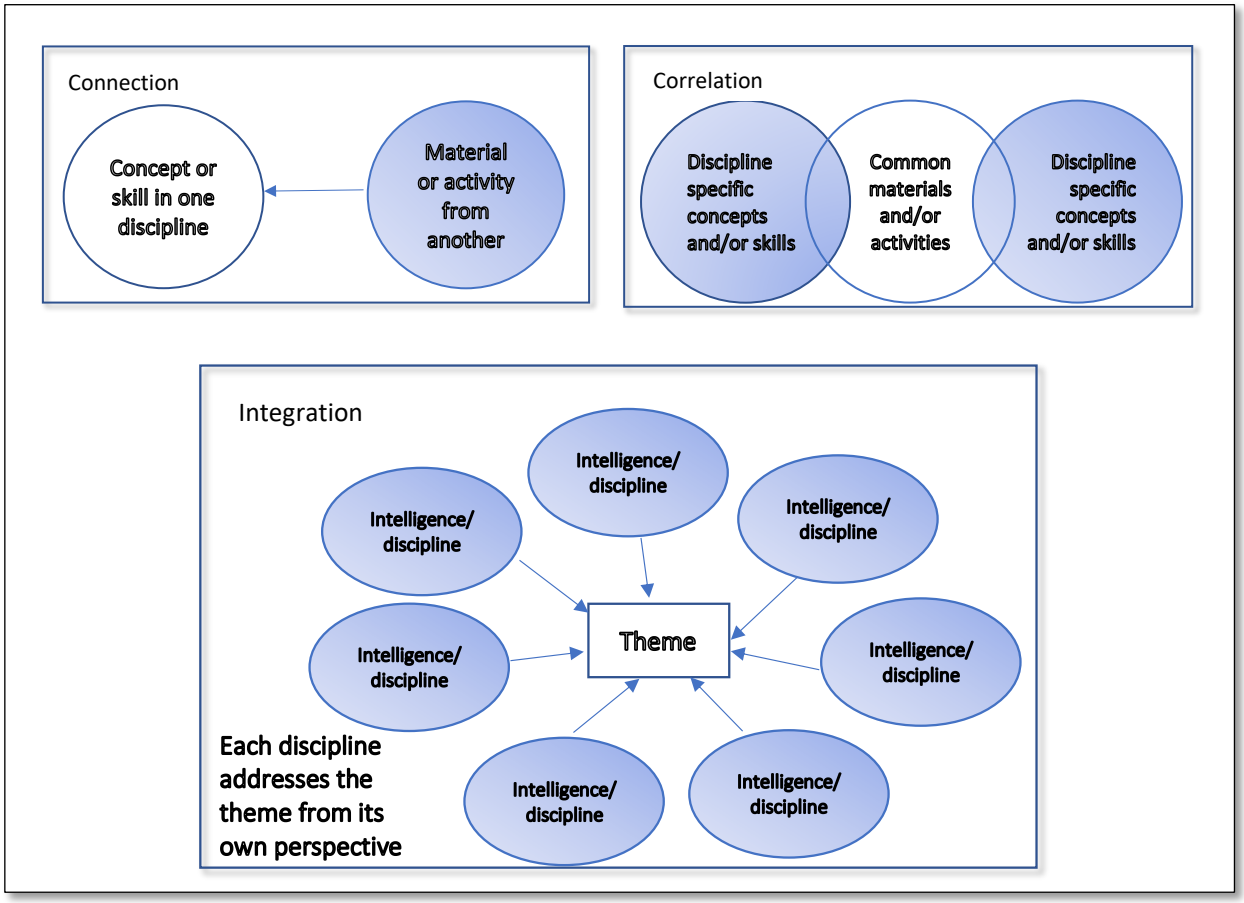
2.2.2 Models of integration in the classroom

Numerous research studies (Berke, 2000; Banks & Banks, 2013; Jansen van Vuuren, 2018a; Snyder, 2001) describe music integration and how it can be utilised to its full potential in schools. Successful practices of integration explored by Snyder (2001), Russell-

Bowie (2006), Banks & Banks (2013) and Bresler (1995) will be explained in the following section.

Snyder (2001) refers to three meaningful ways to link disciplines and intelligences (Figure 2.2): connection, correlation, and integration. 1) Connection has been considered the first step in an integrated curriculum and makes use of concepts from one discipline to help teach a concept in another curricular area. Music is used to assist the learning process; however, constructing new musical understanding is not the focus. This method is commonly used by educators as they do not require any musical background. 2) Correlation is created between two or more disciplines that share activities, which is geared more towards collaborative teaching. 3) Integration is a broad theme that connects various disciplines, where the content can be explored in a meaningful manner. Integration explores a theme through various disciplines from its own perspective. Learning happens in, through and about the arts.

Figure 2.2: *Visual representation of Connection, Correlation and Integration.* Adapted from Snyder's (2001, p. 34-37)

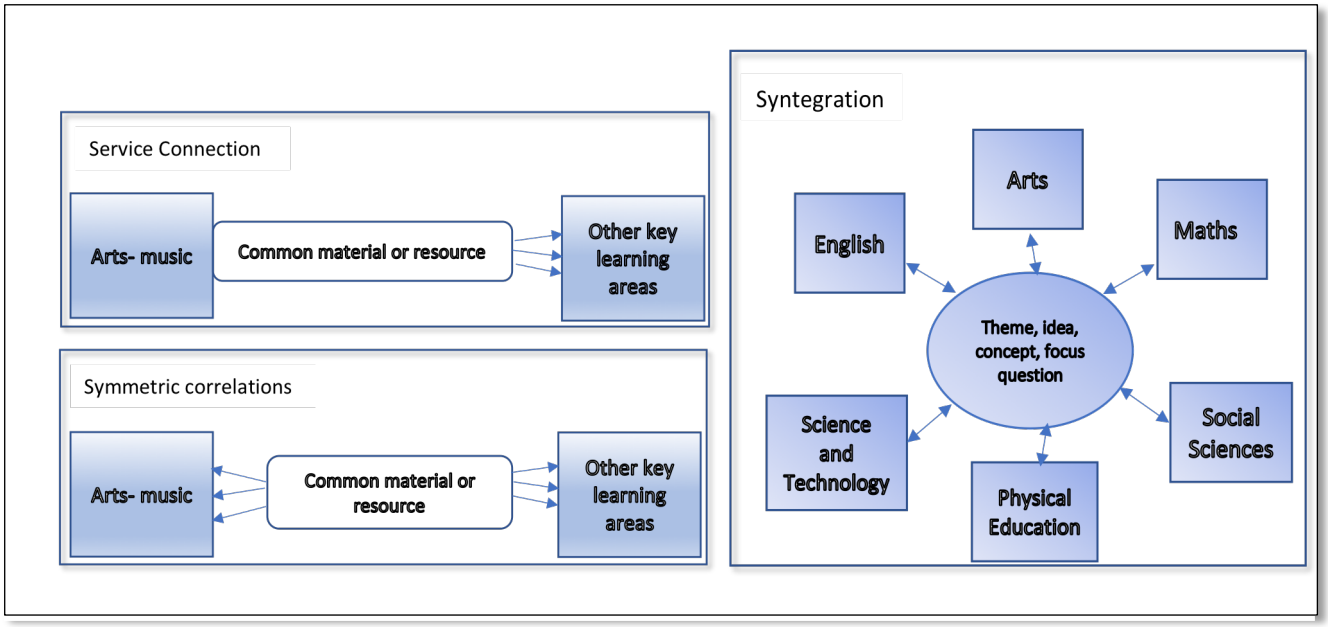


Snyder states (2001) that successful integration involves leading learners to develop a deeper understanding and critical thinking skills through the comparison of ideas. Integration is the process of learning basic skills, musical skills or concepts, through exploring a common theme that guide learners to discover the connections with other subjects (Snyder, 2001).

Russell-Bowie (2006, 2009b) echoes Snyder's theory (2001) with three of her own models of integration (Figure 2.3). The models that were developed are Service Connection; Symmetric correlation and Syntegration. Syntegration is a created word to indicate key

learning areas that are working together synergistically to explore a theme while achieving their own outcomes as well as generic outcomes (Russell-Bowie, 2006, 2009b).

Figure 2.3: *Visual representation of Russell-Bowie's Integration Models* (2006, p. 259-260)



There are a number of similarities between the models of Snyder (2001) and Russel-Bowie (2006). Connection and Service connection are the same, Symmetric correlation and Correlation are similar where the concept and the key learning areas share common materials. One of the reasons why Russell-Bowie (2006) created the term 'syntegration' is due to the overuse, different definitions and general misunderstanding of the term 'integration'. Syntegration serves as a model where all subjects or content areas service the common theme. Russell-Bowie (2006) believes for integration to be successful it needs to be planned with integrity. She explained that holistic, authentic learning experiences makes use of ways of learning that provide learners with opportunities for in-depth understanding, development of generic skills, as well as the ability to generate and apply what they have learned to other situations. This idea is echoed by DeMoss and Morris (2002), and indicates

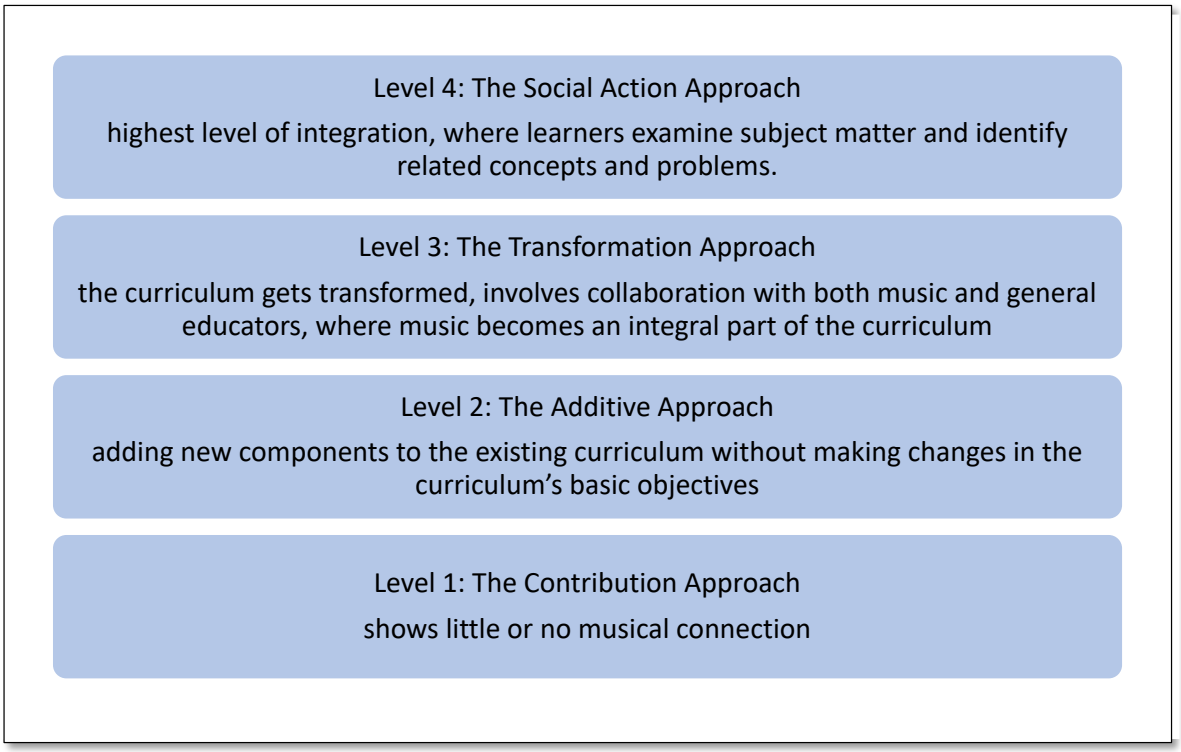
that it is the responsibility of educators to uphold integrity of their subjects; ensure all learners have equal roles, concepts are actively applied to deepen understanding and all educators participate equally and support the content of the curriculum (DeMoss and Morris, 2002).

Russell-Bowie (2006) identifies generic skills that include observation, research, problem solving and teamwork. She stipulates that educators need to plan purposefully and carefully to use broad themes that move across key learning areas, to ensure that the themes are explored in a meaningful manner and within the different key learning areas. The key learning areas should be connected to previous learning areas to create a holistic learning experience. Russell-Bowie (2006) argues that the learning outcome is crucial in the planning process as it highlights aims of the lessons and extends learners' thinking. She recommends that themes should be selected on a basis of promoting and enhancing children's learning. Activities need to be planned carefully, focusing on the intended outcomes for each subject. Russell-Bowie argues that educators need to question if the chosen themes are flexible, age appropriate, and cover key experiences, processes, understandings and skills? Learning needs to be relevant not only to learners' lives, but also to their interests, intelligences, learning styles, abilities and needs (Russell-Bowie, 2006).

Banks and Banks (2013) designed a four-level model of integration that occurs within a curriculum (Figure 2.4): **Level 1:** the contribution approach is the most commonly used by general educators. This approach shows little or no musical connection. Music is used for non-musical purposes, such as background music for a warm-up activity (Berke, 2000).; **Level 2:** the additive approach involves adding new segments to the current curriculum without altering the basic objectives. It includes activities already in the curriculum where music is an addition rather than an integral part of the curriculum; **Level 3:** the

transformative approach refers to the curriculum being transformed. It involves collaboration with both music and general educators, where music becomes an integral part of the curriculum; and **Level 4:** the social action approach is considered the highest level of integration, where learners examine subject matter and identify related concepts and problems.

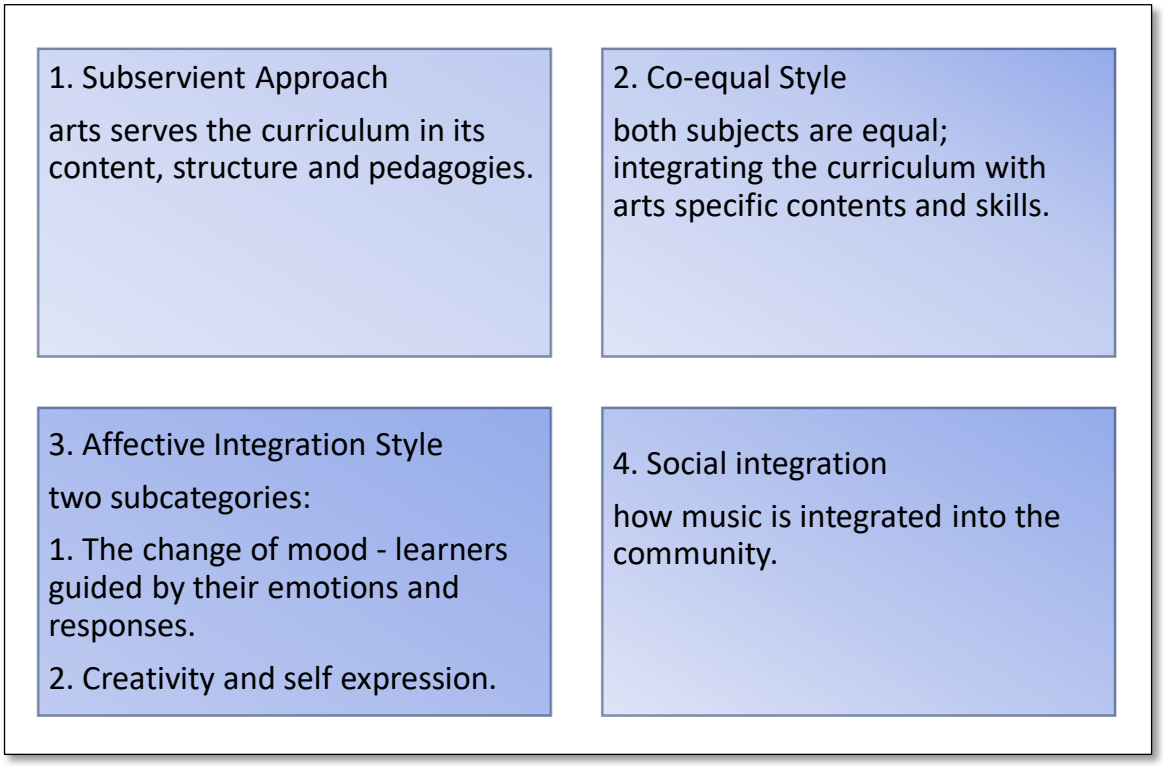
Figure 2.4: *Visual representation of Banks four level of Integration* (Banks, J & Banks, A. 2013).



Bresler (1995) identifies different methods of arts integration and summarises the implications thereof (Figure 2.5). The **subservient style** is used to serve other subjects and the educator does not require any expertise in an art field. The **co-equal, cognitive integration style** requires discipline-specific knowledge. This style suggests both subjects having equal importance and value within the lesson. The **affective style** is divided into two subcategories: the change of mood and creativity. The change of mood encourages learners

to be guided by their emotions and responses. Creativity focuses on active creation and this style is mainly used in the younger primary grades. **Social integration** refers to how Music is integrated into society, for example a school choir or music outreach program. These styles require an improvement to the curriculum and promote a change of existing practices (Bresler, 1995).

Figure 2.5: *Visual representation of Integration styles* (Bresler, 1995)



Comparing the above models, it is clear to see similarities are evident. The *Subservient Approach* (Bresler, 1995) implies that art serves the curriculum, which is similar to Snyder's (2001) *Connection* which makes use of concepts in one subject to teach another; Russell-Bowie's (2006) *Service Connection* uses art to serve other subjects. The second main model that is compared is the Co-Equal Approach presents both subjects as equal (Bresler, 1995); *Correlation* (Snyder, 2001) and *Symmetric Correlation* (Russell-Bowie, 2006) are opportunities for educator collaboration and sharing activities and objectives across two or

more subjects; the *Transformative Approach* has music as an integral part of the curriculum and offers collaboration between educators (Banks and Banks, 2013). *Social Integration* Bresler, 1995) integrates music beyond the school environment; *Integration* explores themes in various subjects from its own perspective (Snyder, 2001); *Syntegration* identifies key areas that can work together for both generic and subject specific outcomes (Russell-Bowie, 2006) and the *Social Action Approach* examines the subject matter and identifies relatable concepts (Banks and Banks, 2013).

2.2.3 Arts integrated activities

Russell-Bowie (2006) proposes that educators should ask the following questions before starting to plan a syntegrated unit:

1. Why am I doing this theme?
2. Who are the learners?
3. How do they learn best?
4. Why is it important for the learners to complete this unit?
5. What do I want them to learn from this unit both generally and specifically?
6. How can I use different key learning areas to enhance and extend their understanding of the theme?
7. As well as achieving certain subject area outcomes, will they be achieving any generic skills (observations, analysis, research, communication, evaluation, problem solving or group work skills)?
8. How will learners demonstrate what they have learned?
9. How will I assess their learning? (Russel-Bowie, 2006, p.266)

Educators are able to use various testing systems before integrating activities in the curriculum to ensure integration is worthwhile. Brophy and Alleman (1991) proposed such a testing system by offering following questions:

1. Is there educational significance in the activity?

2. Would this activity still serve its main purpose if it wasn't integrated with another subject?
3. Does the activity enhance the subject and integration? Integrated activities need to add educational value and meet curricular objectives in at least two of the subjects.

The models endorse collaboration teaching and professional development for effective and successful integration within the curriculum (Brophy & Alleman, 1991). The majority of the integration models suggest that true integration is beneficial to all subjects and not just to one as it can be seen as an avenue for achieving fundamental goals in education (Brophy & Alleman, 1991).

The Music plus music integration framework endorses both avenues of serving music itself as well as enhancing learning in other subjects. "This approach stresses an integration with math and language that is dependent on discipline-specific learning as part of a continuum of arts, academic and social learning" (Scripp and Gilbert, 2016, p.186).

Russell-Bowie introduces different ways of viewing arts education. She explains five activities that can be used to include the arts in a learning experience (2006):

1. **Time-filler activities**: this activity can be used to fill up time at the end of a lesson or at the end of the day. Very little value is place on the arts as an important part of the curriculum and it is not seen as part of a progressive program and therefore few educational goals are reached.
2. **Closed activities:** these activities may relate to a theme but will not necessarily contribute to the understanding of a theme. This approach does not allow for creativity and imagination. All the learners will be doing the same activity that is often a once-off learning experience and may not relate to another art form.

3. **Open-ended activities**: this approach presents materials and then proposes creating a product. Creativity is limited, but there are support activities to develop relevant knowledge and skills. Learners will use the acquired knowledge, but nothing new is learned about art. These activities can be learner-directed with little facilitation and although it may achieve some art outcomes, it does not contribute to a quality, developmental arts program.
4. **Product-orientated activities**: these activities are more focused on the final product than the process, e.g. preparing a product for a show, concert or presentation. This can be educator-focused with little opportunity for learners input or creativity.
5. **Process-oriented activities**: this is the most authentic approach as there is a balance between educator and learner-directed activities with opportunities for action, reflection and both group and individual work. The learning experiences are appropriate, thought-provoking and are integrated across the curriculum. Every learner is involved, their interests, past experiences, knowledge and prior skills are considered. This approach focuses on flexible thinking and out of the box developments. It develops significant educational and personal outcomes within each of the art forms as well as other learning areas. It is rewarding as well as challenging for the learners.

The above models of integration are aimed at the planning process for educators. It is important for educators to have a clear understanding of how and why they have chosen particular integration activities as the integrated activities require educational value. The process-oriented activities might be the best choice for arts integration in a learning experience as learners are actively engaging, prior knowledge and skills are taken into account.

2.2.4 Benefits of music integration

The integration of music with core subjects is not a new idea (Colwell, 2008). Wiggins (2001) suggests that an integrated curriculum does not solve all the challenges in education, however, it does give learners more opportunities to make connections that lead to a deeper understanding. Colwell (2008) reminds educators that their focus must be on maintaining the importance of Music as a subject when used in integration. He also states that Integration suggests a wider worldview as well as an all-inclusive approach to learning which is learner-centred (Colwell, 2008).

Scripp (2000) refers to Wright's (1998) findings that learning through music partially depends on two settings: 1) Authentic music education which involves knowledge of not only repertoire, but also musical competence and music literacy; and 2) the understanding to reflect on how principle musical concepts and procedures can be integrated with other subjects (Scripp, 2000). Scripp explains that research has shown that music education represents much more than limited skills; "music can be appreciated as a distinctive entry point into mathematical concepts" (Scripp, 2000, p. 4). Integrated methods do not only promote individuality but also encourages experimentation, empowers learners and provides a sense of structured 'freedom and artistic play' (Robinson, 2011, p. 298).
The arts integration program has been identified as having a positive impact in improving the learning process (Scripp and Gilbert, 2016)

Arts integration is crucial in primary school education as it enhances teaching and learning, especially at schools that do not have specialists (Barry, 2008, LaJevic, 2013). Researchers (Cardany, 2013; Gray, 2003) argue that the music teaching methods used in the course for Foundation Phase educators are designed to develop: basic performance skills; music

literacy; touch on the different teaching styles; and build confidence when teaching the subject. According to APA standards music supports the development of literacy and therefore music is an essential aspect of the curriculum (DBE, 2011d). Music instruction is able to embody both phonics and whole language approaches through various methods (Steyn, Schuld & Hartell, 2012).

Music is a strong medium for learning as it is able to connect with other subjects by its "emphasis on fundamental learning processes, concepts and representations that are shared with other disciplines" (Scripp, 2000, p. 6).

Russel-Bowie (2006) explains that multiple intelligences can be strengthened with an approach that includes them in every learning experience, e.g., the activity of listening to music will include Musical intelligence (learner taps the beat, sings or hums the main theme); Intrapersonal intelligence (learner visualizes what is happening in the music and how they feel about it); Visual-spatial intelligence (learners draw on their feelings and what they visualized in the music); Verbal-linguistic intelligence (learners share what they felt/visualised, how it is represented, write a summary); Logical–mathematical intelligence (identify structure of music in relation to patterns, sequences or sections in the music); Bodily-kinaesthetic and Interpersonal intelligence (learners work in groups to create a dance to show structure of the music); and Naturalistic intelligence (collect natural objects, name and categorise, create a representation of music using these objects as instruments).

Konishi et al. (2014) explain the principles of learning language as follows: learners must hear more of the language (through singing songs, drama and reading); language materials must be captivating and interesting to the learners; learning environments must be interactive; learners must hear different accents by different language speakers; vocabulary and grammar must play a complementary role in language and learning must occur within a

meaningful context. Russell-Bowie (2009b) attests to the use of integration to provide learners with an all-inclusive and meaningful learning experiences where they are able to simplify understandings and apply knowledge to other situations.

Deutsch (2010) supports the concept that there is a connection between music and language. The connection illustrates music as an important factor in language development as they are both ruled by grammar. Russell-Bowie (2009b) alludes to successful integration having the potential to enhance listening, talking, reading and writing skills. Authors Gözpinar (2017) and Murphey (1990) agree with the pedagogy of using songs for developing language skills, building vocabulary, grammar, pronunciation, as well and listening skills, and enhancing learners linguistically and an appreciation of music. This pedagogy turns passive learning into active learning. Learning an instrument or singing a song is similar to learning a new language. One is required to learn patterns, sounds, rules and master the 'syntax' of the musical work. As learners gain more confidence with these language blocks, they reach the level of enjoyment and fluency (Lems, 2018). Murphey (1990) highlighted how effective pop songs are as a teaching tool when teaching a language due to repetition of words, the use of first and second person. Listening skills in the music class are beneficial to all subjects and the creativity and problem-solving skills children develop as they compose their own music is critical to 'creating a well-rounded child' in the 21st century (Russell-Bowie, 2009a).

Jansen van Vuuren (2018a) believes that if generalist educators can be provided with the knowledge and skills to integrate the arts in their lessons, it will not only benefit learners' skill development but can also be invaluable in other subjects. Arts integration not only offers benefits to the learners - it also offers collaborative teaching opportunities for educators. She enquires if primary school educators, particularly in rural areas, received any

preservice training on learning a language through the use of the arts. (2018a). She concluded that universities should guarantee generalist educators with theoretical knowledge in the arts as well as the opportunity to develop their practical skills to be able to utilise integrated arts confidently and effectively in lessons. If educators can integrate the arts with confidence, it will contribute to learners' acquiring the necessary art skills as well learning in general subjects and refinement of the English language (Jansen van Vuuren, 2018a).

Perger et al. (2018) compare the concepts of patterns in music and in mathematics. The New Zealand curriculum for English medium teaching and learning explains that algebra is about finding, making, continuing and describing patterns and using them to solve problems (Ministry of Education, 2007). The document refers to the characteristics of teaching patterns: counting, repetition and growing patterns. Learners analyse the patterns to work out the rule while using critical thinking and reasoning skills (Ministry of Education, 2007). Perger et al. (2018) refer to ostinatos (a short-repeated rhythm or melody) as patterns in music. Pattern repetition supports the development of early algebraic concepts such as mathematics, music has its own distinct language using both verbal and non-verbal conventions to communicate meaning (Perger et al., 2018). Teachers often play copycat rhythms with younger learners as repeating rhythms is comes naturally to them. This example of integration has both subjects taught equally and at the core the learning.

An et al.'s (2013) exploratory research investigated how educators integrate music into mathematics lessons as well as the effect of Music-Mathematics interdisciplinary lessons on learners' mathematical ability. Their research provided an example of how to design and teach mathematics lessons in different ways and include higher-order thinking skills. They

divided their model into five phases: **Phase one** included educators introducing music knowledge using an instrument or composition. In **Phase two**, the connection between the focused music activity and the related mathematical objectives is introduced. Both subjects are the focus of this phase, however music holds more ground. **Phase three** is facilitated by educators by directing, encouraging and assisting learners to identify the key mathematical concepts in the music activities. Both music and mathematics are of equal focus in this phase. **Phase four** emphasizes mathematics as learners' music projects are used as a resource to: 1) design mathematical concepts; and 2) assign mathematical tasks based on learners' own music work. **Phase five** highlights mathematical concepts and helps learners take their understanding of the content to an advanced level (An et al., 2013). The music related activities that were used to enhance teaching mathematics included singing, playing various instruments such as percussion and the keyboard, use of note values and composition (An et al., 2013).

2.2.5 Constructivism, a learning approach suitable for arts integration

According to Russell and Zembylas (2007) integration in education is by no means a new concept. References to integration are dated back as far as Plato and later to Rousseau and Dewey (Russell & Zembylas, 2007). Arts integration is an approach to teaching that relies strongly on the progression of the learner (Silverstein & Layne, 2010). "Arts integration is grounded in the belief that learning is actively built, experiential, evolving, collaborative, problem-solving and reflective" (Silverstein & Layne, 2010, p. 2). The philosophy of constructivism and its theory of learning suggest that humans 'construct' their own reality and knowledge through personal and meaningful experiences. This perspective

provides a recent theoretic foundation for interdisciplinary curriculum (Chrysostomou, 2004, p. 23).

Piaget (1971) the father of cognitive constructivism believed that we learn by integrating new experiences with previous knowledge and understanding (Campbell And Scott-Kassner, 2014). This theory goes hand in hand with Bruner's (1960) discovery learning, which suggests that we learn best when we discover things for ourselves (Campbell And Scott-Kassner, 2014). Vygotsky's (1980) theory of social constructivism proposes that a person's cognitive abilities are judged through social interactions (Vygotsky, 1980). Constructivist learning is learner focused rather than teacher centred and enables learners to be problem solvers to integrate new knowledge with what they already know (Vygotsky, 1980). There are two notions to consider when referring to constructivist thinking. The first notion is one is able to build new knowledge by using previous knowledge. the second notion is being active during the learning process (Webster, 2015). Marlowe and Page (2005) explain that learners already have an understanding of the concepts of music and music making practices when they come to class. Their familiarity with music activities enables them to connect this knowledge with new content. Wiggins (2015) emphasises that the outcome of a social constructivist music learning experience is conceptual understanding and also the ability to apply those concepts to a number of situations which leads to an independent learner. She stipulates that learners who understand the importance of the content and the goals of the experience, are more likely to take responsibility for their own learning. In order to achieve a social constructivist music learning community, learners need to engage directly with or in the music; engage in real-life, holistic, problem-solving situations; work individually and in groups (Wiggins, 2015). According to Wiggins (2015), the characteristics of a social constructivist learning experience are:

1) learners actively engage in real-life, relevant, problem solving experiences designed to enable them to construct and act on their own understanding;
2) learners work with the basic concepts in ways that foster thinking;
3) learning experiences are contextual and holistic;
4) learners have many opportunities to interact with peers and their teacher;
5) learners' own ideas are central to the learning process;
6) learners are aware of goals and of their own progress;
7) assessment of learning is embedded in and emerges from the learning experiences (Wiggins, 2015, p.26).

During the learning experience educators should be attentive when to apply teacher-centred instruction (Scott, 2012). Wiggins (2015) explains that the role of facilitator allows the teacher to assist the learners in acquiring musical understanding through musical problem-solving (musical scaffolding). Planning a lesson allows the music teacher to decide on guidelines what to teach and how the experience will be organised (Scott, 2012; Wiggins, 2015). These decisions are grounded in the teacher's own knowledge and will determine how the learners will interact with the content to assist learning (Scott, 2012). In class, the lesson content should be discussed in relation to the learners' prior knowledge, real-life experiences and presented as authentic problems (Wiggins, 2015). Vygotsky (1980) explains that learning takes place in the *zone of proximal development* which refers to the area of sensitivity to social guidance, where the learner is not quite able to manage a problem by themselves but is able to work toward a solution when guided by a more knowledgeable other who is able to model an appropriate solution to the problem. It is within this zone that effective learning actually takes place (Schunk, 2012; Wiggins, 2015). Through working with peers and teachers an individual develops understanding, expertise and independence and

therefore will succeed in tackling more complex skills and ideas (Wiggins, 2015). Barell (2007) proposes a structured method of inquiry known as KWHLAQ:

> K (know): What do we think we know about the subject?
>
> W (want): What do we want/need to know about this topic?
>
> H (how): How will we go about finding out?
>
> L (Learn): What do we expect to learn? What have we learned?
>
> A (apply): How will we apply what we have learned to other subjects or to our lives?
>
> Q (questions): what new questions do we have following our inquiry? (Barell, 2007, p.181)

The educators' role is to redirect learners thinking with provoking questions (Gagnon & Gollay, 2006). The educator asks questions to guide and support learners' learning. Learners are also encouraged to search for their own questions, learn from others and work together for a greater understanding. Parker (2007) proposes questions that can be used to navigate constructivist class discussions: 1) direct thinking straight to the learners; 2) focus on learners' thinking; 3) encourage learners to explore and reflect on their thinking and 4) redirect learners to each other (Parker, 2007). Scott (2012) reiterates the KWHLAQ strategy (Barell, 2007) and suggests it as a framework for lesson plans. By using this strategy, educators are able to 1) turn the thinking back to learners; 2) focus on learners' thinking; 3) probe to clarify and explore learners' thinking and promote reflection, and 4) redirect learners to each other (Parker, 2007; Scott, 2012).

Reflection is a crucial aspect of learning as one becomes more aware of their own thinking and strive to have more control of their own thoughts and work ethic (Barell, 2007). Reflection is important for educators to see where learners may need more support which

will assist the educators in their planning and ultimately contribute to achieving their goal of musical understanding (Scott, 2012).

According to Fritz et al. (2020), researchers agree that instruction should be aligned with current knowledge to ensure a solid education for all. Learners need assistance in drawing on their background knowledge to build mathematical knowledge, by using a more focused pedagogy which considers various levels of learners' development (Räsänen et al., 2019). The curriculum that is implanted is not necessarily the intended curriculum. Educators interpret the curriculum to the needs of their class (Thijs & Van den Akker, 2009). Learners need to be competent in establishing the connections between new knowledge and prior knowledge thus the importance to link new knowledge and skills to existing understanding. Learners need adequate time and opportunity to achieve integration (Fritz et al., 2020). When designing constructivist curricula, learners should be given enough time to practice and consolidate the new information. The implementation of activities and exercises also need to accommodate learners at various stages of learning (Fritz et al., 2020). Arts education provides more than enrichment activities, it encourages the transfer of skills between cognitive domains (Overland, 2013, p.33). This alludes to the idea that learning may be less one directional where an educator facilitates the understanding of a single concept rather than a holistic, constructivist experience of developing deeper understanding through which various concepts can be taught simultaneously. In this regard, the literacy skills of music, mathematics and grammar show more similarities than differences– they each use a process of decipher graphic symbols, building syntax and conclude meaning from contextual clues (Overland, 2013).

2.2.6 Musical understanding

The understanding of music can be viewed in various ways including philosophical, emotional, biological, sociological, mathematical, psychological, neurological, aesthetic, and educational (Hallam & Papagerogi, 2016). Musical understanding can work on various levels and can vary depending on the context (Davies, 1994; Tanner & Budd, 1985). The simplest definition of musical understanding is the knowledge of music (Hallam & Papagerogi, 2016). This knowledge can be attained through different teaching and learning approaches (Wiggins, 2015).

Theories of teaching and learning have an impact on almost all musical experiences. These theories about how learners learn provide the teachers with tools to maximise all learning through planned musical experiences (Campbell & Scott-Kassner, 2014). The principle features of some of the theories are explained in Table 2.1:

Table 2.1: *Selected Theories for informing music*

Theory	**Theorist**	**Fundamental characteristics**
Socialisation	Vygotsky (1934)	Human development is a socially mediated process in which children acquire their "cultural values, beliefs, and problem-solving strategies through collaborative dialogues with more knowledgeable members of society" (https://www.simplypsychology.org/vygotsky.html).
Stage-dependent theory	Piaget (1936)	Children move through four different stages of mental development: sensorimotor stage: birth to 2 years; preoperational stage: ages 2 to 7; concrete operational stage: ages 7 to 11; and formal operational stage: ages 12 and up (Campbell & Scott-Kassner, 2014).

Modes of representation	Bruner (1960)	Three modes of representation explain how children store knowledge in their memory: enactive representation (action-based); iconic representation (image-based); symbolic representation (language-based). These ways are relevant to, but not determined by maturation (MacBlain, 2018).
Learning modalities	Barbe, Milone & Swassing. (1979)	Learners learn through visual, auditory, and kinaesthetic channels of learning (Campbell & Scott-Kassner, 2014).
Learning style: Multiple intelligences	Gardner (1993)	People are not restricted to one intellectual capacity, but have many kinds of intelligences (see 2.1.2) (Russell-Bowie, 2006)
Constructivism	Jonassen (1994)	Constructivist learning environments provide multiple representations of reality where children construct understanding through experiences (Seyyedrezaie, S.H. & Barani, 2017).

Wiggins (2015) describes that the fundamental goal of music learning is for learners to understand what is being taught so they can apply what they have learned to a number of new situations. She (2015) also explains that music learning should empower learners with musical understanding with the goal to become proficient and musically independent. Through the musical processes of creating, performing and listening (Wiggins, 2015) learners engage with music as an organised art form that can be divided into sound and silences, and consists of “dimensions of the multidimensional structured whole” (Wiggins, 2015) of pitch including melody and harmony; rhythm which encompasses metre, tempo and articulation; dynamics as well as the qualities of both timbre and texture (see appendix A) (Sarrazin, 2016). According to Le Roux (2014), music dimensions (concepts) can be divided into two groups: **constructive concepts** concerning the structure of the music which include rhythm, melody, texture and form; and the **expressive concepts** tempo, dynamics and timbre. Musical dimensions reflect the that musicians engage with when (Wiggins, 2015). To some degree, all dimensions can be seen as process and product, which highlights

the importance of designing music learning experiences that possess both. These dimensions can assist as a foundation for preparing music learning experiences. Dimensions implies many ways of looking at the same whole but through different frames. Musical dimensions interact in a musical work and the combined result can produce meta-dimensions. Meta-dimensions include: style, genre, architecture, historical context, personal and cultural context, sense of ensemble, affective qualities, space and time. Everything within a musical work is interrelated and interconnected (Wiggins, 2015).

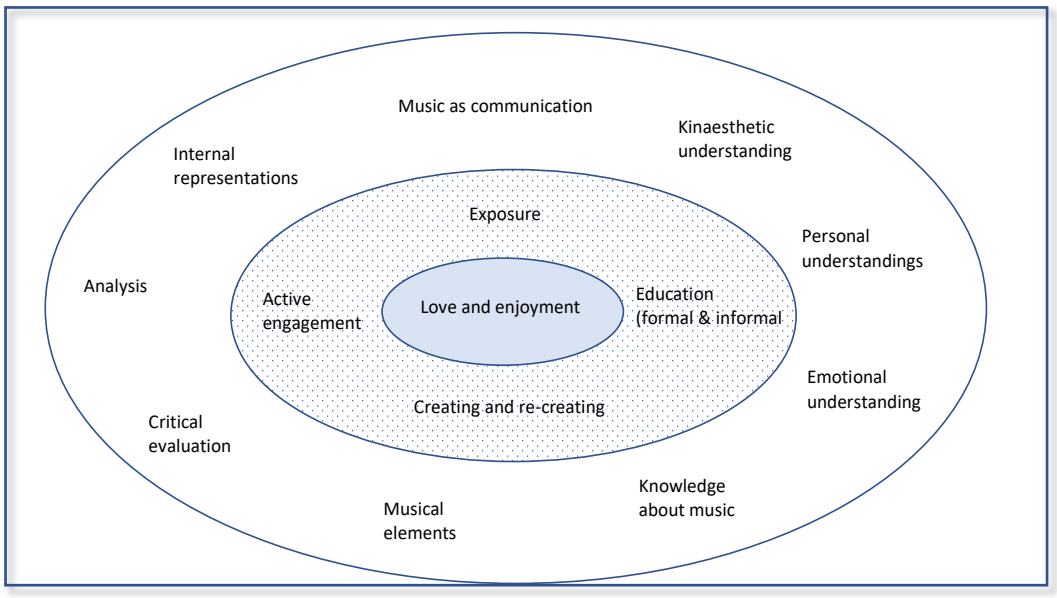
Learners need to actively participate in the process of music to reflect on the dimensions in one art form and to be able to relate to another (Wiggins, 2015). The aim of musical learning experiences is to enable learners to use music as a means of personal expression, whether it be as creators, performers or interpretative listeners. The dimensions of music can be a foundation for planning music learning experiences. Wiggins (2015) suggests using these dimensions as a "doorway in" so to create opportunities for learners to experience and be mindful of the expressive feature as well development of musical understanding.

Learning is the process of finding meaning and making connections in relation to our understanding of prior experience (Wiggins, 2015). Wiggins (2015) provides characteristics of a social constructivist learning experience that allows learners to understand and engage with music through applicable, real-life, problem-solving practices that are "contextual and holistic in nature" (p.26).

Hallman and Papageorgi (2016) echo the theory of constructivism and the learning process in their explanation of musical understanding. Hallman and Papageorgi (2016) explain that musical understanding is divided into two main themes: personal musical understanding in context and understanding as a process. Each of these main themes consist of sub-themes.

The sub-themes for personal musical understanding include comprehension through appreciation and fun, bodily movements and emotional engagement. The sub-themes connected to understanding through process, include understanding through critical development, active learning; education in both a formal or informal context; exposure to music and listening. The model used in Hallman and Papageorgi's (2016) research (Figure 2.6), places love and enjoyment at the centre of conceptions of musical understanding. Positive emotional experiences will lead to enthusiastic and highly motivated learners which will increase their levels of engagement, enhance skills and knowledge.

Figure 2.6: *Promoting musical understanding* (Hallam & Papageorgi, 2016, p.151)



21st-century educators need to include problem solving and critical thinking in their teaching (Liao, 2016) as problem solving does not occur in isolation (DBE, 2011a). Music integration, as part of the Life Skills subject, connects with the holistic growth of learners and can be used to strengthen intellectual development (DBE, 2011a). Arts can inspire critical thinking, help form well-informed 21st-century citizens and benefit child development and learning (Stokrocki, 2005). Arts integration promotes active participation in "experiential learning,

the process for making meaning directly from the learning experience", compared to the study of a subject only (LaJevic, 2013).

Educators are not as involved in implementing additional language as one expects, even though it is a requirement. Textbooks prescribed by the government should be sufficient guidance for educators and allow opportunities for educators to adapt to suit their context. Ball and Cohen (1996) believe that teaching materials should be well planned that it can be used in teacher learning and professional development.

More often than not, singing is used to enhance the learning of one particular subject, and nothing is learned about singing and music (Perger et al., 2018). Simple songs with actions are meant to be sung in Grade R and 1 English lesson according to CAPS how a lot depends on the educators' experience and confidence. Will learners be taught vocal warmups and exercises and how to use their voices correctly or will they sing-along to a CD or they sing with the educator? (Van Vreden, 2016).

Russell-Bowie (2006) provides reasons for using singing in the classroom, it can be used to teach the elements of music and can provide effective integration into themes across the curriculum. They suggest various ways of teaching a song that will also include a musical learning experience. For example, teach the song as a whole, with questions; play or sing the song for the learners. Introduce each repetition of the song with different focus questions or activities, for example; clap on the beat or listen for the low notes. Learning the song phrase by phrase, sing one phrase at a time, then two, three, repeat for the duration of the song. Teaching a song by following words and music; this method can be used to develop knowledge of written music. Rhythmic approach; if the song has a tricky rhythm focus on learning the rhythm first before teaching the rest of the song. Teaching songs with

a recording; encourage learners to focus on listening to the song and musical elements that are used. After listening to the song, clap on the beat, sing the chorus.

McPhail (2017) has the view that curriculum integration should connect content and skills in both subjects around a common theme to benefit both learning areas. The English CAPS document also highlights the importance of this notion however many subjects are still taught independently (DBE, 2011b). Integration is useful to the study of other subjects (Perger et al., 2018) and provides opportunities where learners' general knowledge can be supported by a deeper understanding of the basic ideas in both subjects (Morris, 2003).

2.3 Status of education

The following literature discuss concerns in education from a South African, Australian and American viewpoint. South African generalist educators who are teaching Life Skills are expected to teach music as part of the subject. Due to lack of educator training and curriculum development and financial constraints, this not happening. Extensive research has been conducted in Australia and America that highlight similar issues in South Africa. The discussion will include financial constraints and problems with teacher education.

2.3.1 Financial constraints

In South African schools, because of financial constraints, Foundation Phase educators are expected to not only teach Music, but all Creative Art subjects, even if they are not music specialists. (Holden & Button, 2006; Jansen van Vuuren, 2018b). The schools referred to in this research are public schools that are solely run by the government. Jansen van Vuuren and Van Niekerk (2015), and Hartell et al. (2013) point out that these teachers lacked confidence when teaching Life Skills due to inadequate training from universities.

Research was done in Gauteng province and indicated that not all public schools in the area are in the position to employ music specialists. According to the newsletter of Music in Africa (Music in Africa, 2014), the majority of music specialists work at private schools as these schools have the means to fund a music department. It is believed that English and Mathematics are core subjects and consequently, the majority of the curriculum time is allocated to these subjects within the school day (DBE, 2011d). Arts subjects, including music are considered less significant when compared with the basic skills of mathematics and literacy (Russell-Bowie, 2009a). The issue of finances and budget cuts is not new; this has been happening worldwide throughout history (Keene, 1982; Mark, 1986).

2.3.2 Teacher education

In order for curricula to be implemented effectively, educators need the necessary training. The literature exposes poorly planned workshops in South Africa that leave educators confused as to where, what and how to start teaching the curriculum (Lombard et al., 2010, p. 165; Maphalala, 2006, p. 67; Matshidiso, 2007, p. 109). The training that educators received was brief and only provided background information and guidelines on lesson preparation leaving out all the necessary content knowledge needed to teach Mathematics as well as English language (Makeleni & Sethusha, 2014). Guidelines have been stipulated to assist educators with planning teaching and learning, which include knowledge and skills on a high level, simplicity and accessibility, progress, integration and assessment (Lombard et al., 2010). Lombard et al. (2010) emphasise that educators struggle to perceive how these principles are demonstrated in teaching and learning. The findings disclosed educators training included only background knowledge and recommendations for lesson planning (Makeleni & Sethusha, 2014, p. 103). Research done in Gauteng, South

Africa confirms that majority of educators' lack confidence and skills in the arts due to lack of training at university level (Jansen van Vuuren & van Niekerk, 2015; Russell-Bowie, 2009a). This issue in education training is not specific to South Africa but also applies to New South Wales, Australia (Bainger, 2010). Bainger (2010) highlights that negative music experiences in different phases of education had a real impact on the educators' beliefs. Educators should adapt to the role of co-player and include all learners in an adaptable and playful manner to increase engagement and enjoyment (Wright, 2003). Russell-Bowie (2009b) adds that due to poor quality of lessons, arts education does not reach deeper understanding due to superficial integration styles.

Colwell and Berke (2004) investigated an undergraduate course in Kansas, America that offers generalist educators the skills and confidence to integrate music into their teaching. During the course, educators were expected to present strategies on how to achieve music objectives and include music activities within the curriculum. They highlighted the importance for educators to develop the means to create music experiences that are able to integrate music into the curriculum (Colwell and Berke, 2004).

Stein (2002) suggests that preservice teaching courses, in the United States have failed to address the importance of attitude and values when it comes to teaching Music. Holden and Button (2006) found in their study (in the United Kingdom) that there is a need for more support and training to increase non-specialist's music knowledge, skillset and confidence in order for the educators to make a difference to their learners' musical education. Scripp and Gilbert (2016) allude to music specialists in American public schools, having limited resources and insufficient time within the school day as well as not having the opportunities

for professional development particularly focused on music education (Scripp and Gilbert, 2016).

Delport and Browne (2015) also express their concern that because of lack of training in arts education in South Africa, “non-arts” specialist teachers (p. 363) are not able to facilitate and enable purposeful learner participation within the arts. They also argue that teachers are not being prepared to skilfully guide learners to understand the specific and fundamental differences between Western and indigenous African arts (Delport and Browne, 2015). The following challenges were identified in music education programmes: 1) lack of knowledge about the curriculum and its requirements; 2) lack of prep time; 3) lack of time in the school day; 4) lack of priority for music; 5) lack of personal musical experience; 6) lack of decent resources (Russell-Bowie, 2009a). Research was conducted on the view of South African educators’ perceptions on teaching music (Russell-Bowie, 2009a). The results indicated majority of educators believe that music education should have a higher priority in primary schools. In conclusion, schools need to invest in training educators, decent resources and giving music enough time to fulfil the aims of the curriculum (Russell-Bowie, 2009a).

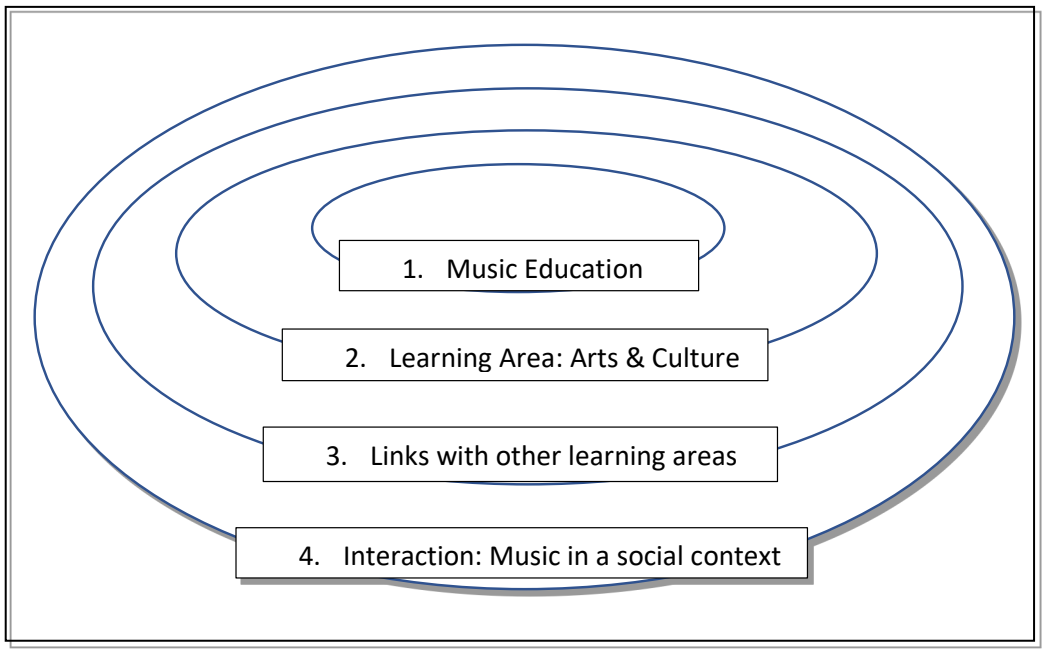
South African and Australian researchers collaborated to explore the best process for educator training at universities in South Africa regarding Arts integration (Joseph et al., 2008). Joseph et al. (2008) propose five skill levels for arts educators and integration: **Master of all trades** refers to an educator that is a specialist in each art form or most of the art forms; **Master of one trade only** is a specialist focusing on one art form; **Master of one trade, Jack of some** refers to educators who are employed as a specialist in one art form but then undergo professional development so that they can link one art form significantly to

another art forms. According to Joseph et al., this situation is regarded as the best solution in teacher training as the focus is mainly in one art form. They approve that a strong foundation should be given in one art area before training educators to integrate other forms of art in a meaningful manner. The next level according to Joseph et al. (2008) is **Master of one trade, Jack of none** and lacks integration of other art subjects. **Master of no trades, Jack of none** indicates facilitators with little to no background and training in the arts (Joseph et al., 2008). The researchers regrettably express that educators in South Africa are often employed as general educators who focus on the core subjects, such as Mathematics. Joseph et al. (2008) recommend that greater awareness should be made regarding the importance of having art specialists in schools. They argue that regardless of the fact that Arts and Culture is a compulsory subject according to the CAPS document (DBE, 2011d), the majority of schools in South Africa do not have one specialist educator to teach one art form let alone integrate all the art forms. Due to this dilemma, numerous schools are not teaching the arts (Joseph et al., 2008). Looking at the different levels proposed by Joseph et al., (2008), they affirm that the **Master of all trades** is not a viable option due to the extensive training required for each art form and the lack of staffing at universities, even though some students are multitalented and would want to improve their art skills. **Master of one trade only** (Joseph et al., 2008) mainly applies to private schools due to funding and is the ideal option as each specialist focuses on their art form. According to Joseph et al, (2008), **Master of one trade, Jack of some** are teachers who are employed as a specialist for one particular art form but are in the position where they are required to teach another art form or start an art integrated programme consisting all art forms. With a strong foundation in one art form, and through professional development, music specialists can easily learn to integrate other art subjects in a practical and meaningful manner. The **Master of one trade,**

Jack of none is the lowest level of teaching and integration. as the preferred art form is favoured, and the integration level is unsatisfactory. For this level, suitable training needs to happen as the educator is only trained in one art area but is expected to teach all four. **Master of no trades, Jack of none** is unfortunately the reality that majority of South African schools' face where educators are not trained as specialists in any of the art forms (Joseph et al., 2008). This research discovered that when specialists are not appointed to teach music, music is often not taught. I agree with authors Joseph et al., (2008) that **Master of one trade, Jack of some** is the appropriate skill level for educators as they have one speciality and can then undergo professional development in another art area. Lecturers and educators are expected to be versatile in their teaching skills and various art forms, so in order to keep a high standard of education, team teaching, and collaboration are required. This is one manner in which **Master of one trade, Jack of some** can be achieved.

Joseph et al. (2008) refer to music education as the internal integration between the various components within music (Figure 2.7). The interaction lies between music concepts and music activities. According to Joseph et al., links with music and other learning areas implies the circling process between the disciplines. The fourth level of integration is Interaction which highlights the role of music in a social context.

Figure 2.7: *Integration of Music with other subjects in teacher training* (Joseph et al., 2008)



Joseph et al. (2008) recommend that to improve teacher training in South Africa preservice training should include teaching music as the foundation subject for successful integration of the other arts. Integration has a close association to an interdisciplinary curriculum. They also affirm that by teaching basic music concepts and elements first, students are able to make connections to dance and drama as performing art (Joseph et al., 2008).

Ellis and Fouts (2004) emphasise that an interdisciplinary curriculum improves higher-order thinking skills where learning is less divided, and learners are exposed to a more holistic approach to learning. Joseph, et al. (2008) accentuate the importance of laying down the foundation of music before adding the other arts, as it provides educators with the essential tools and methods of how to integrate the content of the other art subjects.

Oreck (2006) stresses the need to vary teaching methods to meet the diverse needs of learners. In order to achieve these different methods, educators need to include the arts in their teaching style. He explains that the study of art comprises the development of skills in creating (performing and producing works) and the process of study (analysis and

reflection). Vygotsky emphasizes that the process of making the artwork is more important than the final product (Vygotsky, 1971 as citied in Oreck, 2006). Oreck (2006) agrees that the focus of professional development is to promote creative teaching techniques, increase educators' knowledge and understanding of arts processes and aesthetic qualities as well as develop basic art skills. He found that educators that successfully incorporated arts in their pedagogy had the belief that artistic approaches were congruent with their educational values and care for their learners (Oreck, 2006).

2.4 Curriculum design and lesson planning

There are many types and sources of curricula available that are formal, ideal, instructional, operational and experiential (Campbell & Scott-Kassner, 2014). The CAPS document is a formal curriculum as it provides guidelines for educators on what should be taught and how to assess (DBE, 2011b). All three CAPs documents include topics and themes. The Life Skills document assessment plans are indirectly included in the document and are completed through observation. The English language document includes informal, oral, practical and observation assessments as well as various topics and themes that need to be covered. The Mathematics document is more detailed than the other documents where educators can teach straight from the document. Topics, themes and assessments are provided in detail. Focusing particularly on a quality music curriculum, goals, skills and outcomes should be provided as well as demonstrating the nature and content of music. Planning a lesson will include the preparation of material, connecting to learners' prior experiences, planning objectives, listing musical problems to be solved and deciding on how assessment will be implemented (Wiggins, 2015).

2.4.1 Curriculum

A curriculum aims to provide a systematic and sequential presentation and assessment of instruction. Learning objectives, class materials and lesson plans are included to assist educators (Flohr & Trollinger, 2010). Stabback et al. (2011) emphasize that the objective of a curriculum is to provide learners with the necessary "knowledge, skills, values and attitudes" to be successful in both their careers and personal life. An effective curriculum includes respecting learners as individuals; have an understanding of the way they learn; encourage teaching approaches that demonstrate these concepts of learning; and represent development procedures that reflects learners' interest (Stabback et al., 2011, p. 6). The different types of curricula include a formal style which provides a general outline of the expected outcomes that ensure consistency occurs through various grades. **The ideal curriculum** is a comprehensive and sequential approach to the content of a specific subject area (Campbell & Scott-Kassner, 2014). **The instructional style** comprises detailed lesson plans that educators make for their lessons reflecting the formal curriculum which includes use of materials as well as how individual progress will be assessed (Campbell & Scott-Kassner, 2014). **The operational curriculum** is probable to various influences and this is the curriculum that is implemented in the classroom. **The experiential style** is the curriculum that learners, parents and administrators receive (Campbell & Scott-Kassner, 2014). A good quality curriculum focuses on learning and learners by being inclusive, progressive and preparing learners to become competent and successful in the 21st century. Encouraging educators to recognise learners as individuals; and to be facilitators of learning acknowledging and accommodating various ways of learning. Learning content needs to be current, purposeful, balanced, integrated and in line with international progressive practices and expectations. The delivery of the curriculum to the

education system, including learners and educators need to be concise and offer helpful advice (Stabback et al., 2011). The curriculum requires aims of the course; behaviour expected of the learners; expected outcomes; topics; time allocation for the course; suggested teaching and learning methods; assessments and recommended resources (Reece & Walker, 2007). A curriculum framework, subject curricula, curriculum support documents which are comprehensive, clearly expressed, consistent in their philosophy and approach as well as supporting the curriculum implementation and evaluations processes is the result of a good curriculum. These processes are led by capable curriculum professionals, who reinforce specialised units that are planned and systematic, acknowledge the cyclical nature of curriculum development and values the inputs of stakeholders.

The CAPS document is a formal curriculum as it provides guidelines for educators on what should be taught and how to assess (DBE, 2011b). All three CAPS documents include topics and themes. The Life Skills document (DBE, 2011a) assessment plans are indirectly included in the document and are completed through observation. The English language document (DBE, 2011b) includes informal, oral, practical and observation assessments as well as various topics and themes that need to be covered. The Mathematics document (DBE, 2011c) is more detailed than the other documents where educators can teach straight from the document. Topics, themes and assessments are provided in detail. Focusing particularly on a quality music curriculum, goals, skills and outcomes should be provided as well as demonstrating the nature and content of music.

Research in South Africa has found that in order for the curriculum to be successfully implemented educators require suitable training (Makeleni & Sethusha, 2014). Makeleni and Sethusha (2014) exposes the lack of effective teaching and learning particularly in

Mathematics and Literacy in the foundation phase. Lombard et al. (2010) confirms that educators are not upholding the principles set out by the Department of Education as clarity is needed on how the principles are demonstrated in teaching and learning. The principles include a healthy environment; social justice; human rights and inclusivity; clarity and accessibility; high level of skills and knowledge; progression and integration and assessment (Lombard et al., 2010; Makeleni & Sethusha, 2014). Makeleni & Sethusha (2014) confirm that educators only teach topics they are comfortable with and highlights that educators' teaching practice is influenced by their understanding and experiences.

Educators don't seem to be aware of alternative teaching strategies and lack confidence in using inquiry-based teaching methods (Mohd Meerah et al., 2010). Educators, particularly in rural schools, struggle with multiple strategies that creative subjects require (Peat, 2009). Educators in disadvantaged schools tend to have lower expectations of their learners and therefore tend to interpret the curriculum to match these expectations (Fleisch, 2008). Educators would benefit from having examples of how to plan and structure lessons with learning activities that bring the curriculum to life. It is the responsibility of school managers to support good teaching and learning practice with the necessary resources (Stabback et al., 2011).

A curriculum defines the learning required in a specific subject at various stages. It is normally drafted by subject specialists who are familiar with the knowledge, skills, values and attitudes specific to the subject. Ideally, the authors are experts in pedagogy and child development (Stabback et al., 2011). In a curriculum provision should be made for: 1) learning activities that are well planned in order to develop understanding over time; 2) a programme that contributes to learners' mental and physical skill development; 3)

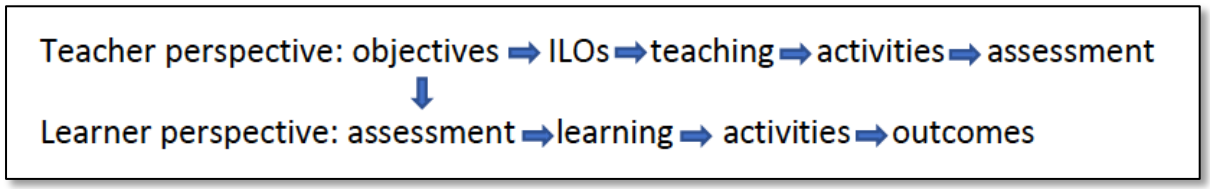
maintaining consistency in the approach between subject areas and with values and principles; 4) links between subject areas; 5) flexibility of the curriculum to adapt to the needs of different learners; 6) a curriculum that is created to be dynamic, adapted, edited and improved (Stabback et al., 2011). In order for the curriculum to been seen as coherent and clear, it is crucial that there is reliability between the model and learning backup materials in order for the curriculum to be presented as a whole that is coherent and transparent. A good curriculum should be defined by a framework and then applied in textbooks and other learning materials. The characteristics of a good curriculum development process include being led by curriculum professionals; planned, systematic and sustainable: the development of curriculum should follow a transparent and publicly known process and be well-managed in terms of focusing on the curriculum vision, effectiveness of activities and adherence to timelines and budgets; plans should include sequenced development workshops; timelines; expertise and anticipated costs. Curriculum development should be sustainable as it is a dynamic and continuing process and systems should ensure that they provide the leadership, resources and expertise to ensure that curriculum can be regularly evaluated and improved (Stabback et al., 2011). Curricula should be flexible enough to allow for adaption as 21st century skills are often changing (Stabback et al., 2011). This is why the curriculum needs to be monitored and evaluated. Standards are needed against which to test the quality of the curriculum being developed, even before implementation. As well as when the new curriculum is rolled out, then the impact on learners needs to be monitored and evaluated against the key aims that been set (Stabback et al., 2011).

Biggs (2003) devised the term ‘constructive alignment’ which is an approach to curriculum design that highlights conditions for quality learning. The aspects of teaching and

assessments need to support high level thinking to ensure learners use higher-order learning processes. The aims of teaching need to be aligned with assessments. There are two aspects to 'constructive alignment': 'constructive' refers to making meaning through applicable learning experiences where meaning is created by the learners. Teaching is simply a catalyst for learning. 'Alignment' is what the educator does, for example setting up the learning environment that is conducive for obtaining the projected learning outcomes. It is important that the teaching approaches and assessments are aligned with the learning activities in the expected outcomes (Biggs, 2003).

Biggs (2003, p.4) proposes four major steps in 'constructive alignment': specify the intended learning outcomes (ILOs); carefully select teaching/learning experiences that will lead to the ILOs; assess learners' actual learning outcomes to see their level of achievement; and arriving at final grade. Ramsden (1992) deduces the difference between educator and learner perspectives on assessments (Figure 2.8).

Figure 2.8: *Educator and Learner's perspective of assessing learning outcomes* (Ramsden, 1992)



Educators need to work towards closing the gap between educator and learner perspective. Constructive alignment is a method that that has the potential to align intended learning outcomes, teaching activities and assessments as it focuses on aligning the assessment to the objectives as well as expressing the objectives in terms of the intended learning outcomes. Assessment tasks are defined and in turn algins the teaching approach with the

expected outcomes and assessments (Biggs, 2003). Constructivism is not a curriculum, but rather a recommendation of how learners learn and teaching for learning (Webster, 2015). By adapting the curriculum to include integration, it will not only save time in an already busy curriculum but also connect themes across different subject areas which will enhance the learning process. Well planned integrated activities develop understanding over time, which aligns with Biggs (2003) 'constructive alignment' theory where making meaning happens through experiences. Music activities contribute to mental and physical development which links to what a curriculum should be able to achieve (Stabback et al., 2011).

2.4.2 Lesson Plans

The lesson planning process needs to be refined, educators should consider a) what will learners be learning; b) what learners will be doing in order to learn – the activity; c) musical context within which they will be learning; d) how the experienced will be organized; e) how educators and learners will know learning has taken place (Wiggins, 2015).

Russell-Bowie (2006) suggests the following steps towards teacher's preparations and lesson planning. **Step one**: contextual description: identifying learners previous learning experiences, skills and knowledge. Be aware of their cultural, cognitive, creative social and emotional differences, as well as attitudes, interests and needs. **Step two**: syllabus outcomes: what will the learners learn in this lesson, refer to government syllabus. **Step three**: purpose of the lesson: this step is crucial for both the educator and the learners. Why is this lesson being taught? Does it fit in the syllabus? **Step four**: specific indicators: learning outcomes can be set for each activity that is completed in the lesson. These assists both the

educator and learners with their learning progress in class. **Step five**: link to other key learning areas: this provides learners with a holistic view of learning and they are able to relate the learning experience to prior knowledge and skills. Behaviour management strategies decide on a positive reinforcement approach that will be used during the lesson. Classroom organisation is how learners will move around the classroom, how will they use instruments, pack them away. Resources include what educators require to teach this lesson?

1. What is the musical experience of the children?
2. What are their musical abilities?
3. How difficult is the activity in relation to the above?
4. What elements of music do you want to develop?
5. What skills do you want to develop?
6. What attitudes and values do you want to encourage?
7. How will you assess the learners' progress and development?

(Russell-Bowie 2006, p.57)

It is important for educators to reflect on their lessons through the process of evaluation and reflection. Through this process educators are able to improve their teaching strategies as well as give learners a better learning experience.

2.4.3 Assessments

Assessments are a fundamental part of planning on many levels. Educators need to know what to teach and when and be attentive of learners' prior knowledge. Throughout the lesson, the educator needs to be mindful of the "nature and extent of learners' understanding of what is being taught" (Wiggins, 2015, p. 68) so that they know how to

continue with different aspects of the lesson. Educators need a means to determine the degree of each learners' understanding. Assessment of understanding can also play a part in what should be presented in later lessons (Wiggins, 2015). The goal for assessment is to find out if learners understand what is being taught. This ongoing assessment takes place throughout the lesson. Observe learners' interactions and offer support and guidance where needed. Formal means of assessment can be added by including activities that reveal the degree of the understanding needed for the lesson. Formal assessments need to be authentic assessment techniques such as real-life, problem solving experiences that are designed to enable learners to demonstrate their understanding of musical ideas in a musical context (Wiggins, 2015). Assessments can vary in form, perhaps you want to record the learners' performance thus giving them the opportunities to self-reflect or assess at a later stage. Rubrics are another means to efficient assessing. Rubrics can be given to learners ahead of the assessment so they are aware of the expected outcomes and understand what their performance will be measured against (Wiggins, 2015). Examples of assessment activities include portfolios, tests and projects. Portfolios include any kind of musical creation from worksheets, performances projects and writings.

Rubrics can be used to assess teaching, learning, participation and progress in learning skills and final achievement. The key to an effective rubric is that the levels and what is required are defined and are easy to understand by both educator and learner (Flohr & Trollinger, 2010). Learning proceeds from the concrete to the abstract, from prior knowledge to new, obvious to subtle, simple to complex and familiar to unfamiliar (Colwell and Wing, 2004). Taxonomies are useful to classify; order establish priorities and to gain reasonably complete idea of the scope of a field. Taxonomies are developed to portray learning in various

dimension including psychomotor skills, affective or experiential objectives and cognitive skills. The most well-known taxonomy is Bloom's taxonomy.

2.5 Curriculum Assessment Policy Statements (CAPS)

The CAPS documents were written with the goal of providing expression to the skills, values, and knowledge deemed to be worth learning in South African schools. One of the goals of the outlined curriculum is to ensure that learners acquire and apply the knowledge and skills in a meaningful manner and to encourage all learners to be global citizens. Life Skills has been considered a linking subject that supports and strengthens the teaching of the core Foundation Phase subjects such as Languages and Mathematics (DBE, 2011a). The curriculum supports the right for all children to have access to basic education, however it is the responsibility of educators to ensure that they deliver the best lessons possible and are open to new ideas, collaboration, and personal growth.

2.5.1 Life Skills

Educators in the Foundation Phase are expected to teach all the Life Skills subjects, which include Creative Arts: Dance, Music, Visual Art, and Drama; Physical Education; and Personal and Social Well-being. Not all institutions or colleges include all these subjects in their courses and if they do, content is reduced in short courses (Jansen van Vuuren, 2018b). The nature of Life Skills as a subject provides the opportunity to teach in an integrated manner (Steyn, Schuld & Hartell, 2012).

2.5.2 English and Mathematics

English and Mathematics have a clear outline from the CAPS documents of what is expected for educators to teach, however, the delivery of the lessons is left to interpretation of the educator. The English curriculum focuses on the following areas:

listening and speaking; reading and phonics; writing; thinking, reasoning and language structure. The English CAPS document refers to an integrated approach. Language is used across the curriculum in reading, oral and written work. Listening and speaking language skills should be developed within other subjects such as Mathematics and Life Skills. Themes and topics can be chosen from these subjects to provide context for language skills (DBE, 2011b).

The Mathematics curriculum focuses on the following content areas: numbers; operations and relationships; patterns, functions, algebra; space and shape (geometry); and measurement. “Specific skills have been identified to develop essential mathematical abilities in every learner: develop the correct use of the language; develop number vocabulary, number concept; calculations and application skills; listen, communicate, think, reason logically and apply the mathematical knowledge; investigate, analyse, represent and interpret information; propose and solve problems; and build an awareness of the important role that Mathematics plays in real-life situations, including the personal development of the learner” (DBE, 2011c, p.8). Before a child starts school, they are able to make judgements, estimate, establish the concept of money and values. Educators need to concentrate on building the vocabulary of number names, counting, fractions, shape, measurement, money and money value. The major implication of Vygotsky’s theory exposes the importance of learning with peers and educators as well as how learners need to be involved in their own learning, through the use of discourse, arguments, and collaboratively solving real-life problems (Naidoo & Mkhabela, 2017).

Chapter 3: Research methodology

Methodology is defined as "a system of ways of doing, teaching, or studying something; a set of methods used in a particular area of study" (Cambridge English Dictionary Online, 2020, par. 1). This chapter focuses on explicating the methodological approach employed in this research study. The research approach, design, data collection methods and data analysis are illuminated. Additionally, the ethical considerations, applicable to this study are discussed.

3.1 Research approach

Qualitative research is based on the belief that knowledge is created by people in an ongoing manner as they engage in meaning making of a shared experience. Qualitative studies focus on how people interpret their experiences, how they construct their worlds, and the meaning they place on their experiences (Merriam & Tisdell, 2016). Merriam and Tisdell (2016) explain the following four characteristics that are most common to the nature of qualitative research: the focus on the inductive process; the understanding and meaning; the researcher acting as the main instrument of data collection, and analysis to create a descriptive product. This research supports a qualitative research approach. I focused on the inductive process and gathered data from both literature and the national curriculum documents to build concepts that outline the process of meaning making – the integration of musical knowledge into the learning and teaching of Mathematics and English in the Foundation Phase. As researcher, I was the main instrument in gathering data, and interpreted the integration of musical knowledge in order to create teaching activities suitable for the Foundation Phase classroom. The literature that was gathered was to support the benefits of arts integration focusing particularly on music.

3.2 Research design

Document analysis is a qualitative research design makes use of a methodical process for studying and evaluating documents (Bowen, 2009). Documents are the main data source to find meaning, understanding and developing knowledge by examining and interpreting data. The researcher relies on interpretation and description of the data from previous studies and documents instead of using raw data for analysis (Bowen, 2009).

The researcher needs to determine the purpose of the documents, the context and then ensure that the analysis process is as transparent as possible (Bowen, 2009). Coffey (2014) reasons that qualitative research can be deepened by paying thorough and critical attention to the gathering and analysis of documents of different kinds.

The current study included a close reading of the documents, an understanding of the ways in which they were written, produced, used and consumed, as well as extensive reading of literature in this field. This analysis is a way of understanding social practice. Analysis of the following documents were also be included: the CAPS documents for English and Mathematics; the National Protocol for Assessment Grade R – 3; and the National Curriculum Statement Grade R – 3, as well as other literature pertaining to the topic.

Through stem education, an interdisciplinary teaching approach which incorporates four specific subjects, Science, Technology, Engineering and Mathematics, the researcher wanted to explore the possibilities of implementing arts integrations (focusing on music) in the current CAPS documents. This was accomplished by answering the research question: How can teaching and learning of Foundation Phase Mathematics and English be enhanced through music integration?

3.3 Data collection methods

Data collection and analysis take place hand in hand in qualitative research (Merriam & Tisdell, 2016). Data collection took the form of documentary research. Documentary research is the process of using documents as a means of investigation which explores the records created either by individuals or organisations (Gibson & Brown, 2009). For this research, the documents were studied intensively for data collection, including the National Curriculum, the National Protocol for Assessment Grade R – 3, and the CAPS document with the focus on Mathematics and English in the Foundation Phase. These documents are in the public domain and are easily accessible from the Department of Education's website. The above-mentioned documents include the expected outcomes outlined by the Department of Education and were used as a primary source of data. Analysis should be viewed with data collection as a basic feature (Gibson & Brown, 2009). A holistic approach needs to be adopted. The documents should not be viewed as concrete evidence but rather examined as a guideline of what is expected. This understanding suggests a reflective manner in how we should treat the documents as social data (Coffey, 2014). The data collected from the above-mentioned documents have provided descriptives that should offer a clear outline (Merriam & Tisdell, 2016) to help with the analysis process. For each grade in English, Mathematics and Life Skills (Creative Arts), the purpose, expected learning outcomes, knowledge, skills and values were highlighted. The focus of the outcomes within the CAPS documents include critical and creative thinking; working effectively as a team; organize and arrange themselves sensibly and efficiently; as well as gathering, arranging, analysing and critically evaluate information, show their understanding of the world and recognizing that problem-solving contexts do not exist in isolation (DBE, 2011a; DBE, 2011b; DBE, 2011c). The main purpose of English is for learners to acquire the language skills required skills for

academic learning, confidence in all aspects of the subject and to use language as a means for critical and creative thinking (DBE, 2011b). The main purpose of Mathematics is to instil curiosity and a love for the subject as well as to create awareness of mathematical relationships and how they are used including a recognition that Mathematics is creative and can be applied to other subjects (DBE, 2011c). The intention of Creative Arts is to advance learners as creative, resourceful individuals who appreciate the arts who can solve problems using creative and critical thinking skills (DBE, 2011a). English is divided into four language skills; listening, speaking, reading and writing. Due to the fact that English is the language of instruction, it is integrated into all subjects. Listening and speaking skills are also developed in Mathematics and Life Skills (DBE, 2011b). Mathematics is a language that uses symbols and notations for describing numerical, geometrical and graphic relationships. Mathematics develops mental processes that improve accuracy, logical and critical thinking, and problem-solving that supports decision-making (DBE, 2011c). These aims and outcomes provide a clear outline of what is expected from educators. They also offer ideas on how music integration in the learning environment can be used to enhance the understanding of both the core subject and musical knowledge. Document analysis was an efficient method as the data process is selection instead of collection and the aim of this research aligns with the expected outcomes of the Foundation Phase curriculum.

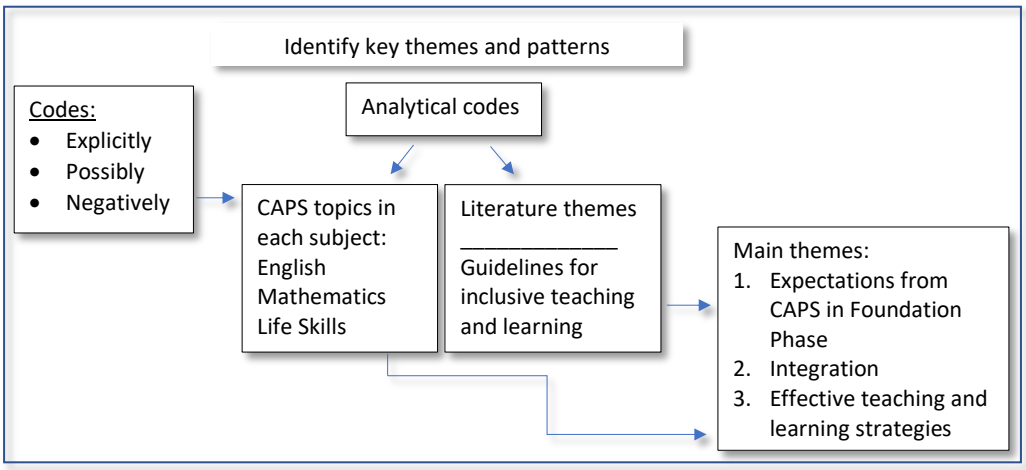
3.4 Data analysis

Data analysis is the classification and interpretation of material that formulates statements about both implicit and explicit dimensions, make meaning of the material and what is represented in it (Flick, 2014). Through the process of making meaning from the data, the researcher consolidates, reduces and interprets the data including what other

authors have found and what the researcher has discovered (Merriam and Tisdell, 2016). Documents are instruments and mediums for understanding and making sense of practices, including social and organisational (Coffey, 2014). The analytic procedure includes selecting, appraising and synthesizing data within the documents. The data, excerpts, quotes and passages were organised into themes, categories and case examples, particularly through content analysis (Bowen, 2009; Labuschagne, 2003). Data analysis is an intricate process that involves constant back and forth between concepts and data, as well as "inductive and deductive reasoning, between description and interpretation". These understandings establish the findings of the study (Merriam and Tisdell, 2016, p202).

For this research, the documents were analysed through a coding process. The process involved annotations by the researcher, that started with open-coding and then moved to analytical coding. Analytical coding comes from "interpretation and reflection on meaning" (Merriam & Tisdell, 2016, p206). The coding included three codes, **explicitly** – integration is a definite, **possibly** – integration is possible and **negatively** – where there is no room for integration. Other codes included grouping themes and topics together to see if integration is viable.

Figure 3.1: *Data analysis method*



The diagram above represents the process of how the codes were applied to find emerging themes. Open coding was used throughout the CAPS documents to determine if integration could either be explicitly, possibly or negatively applied to the topic. Analytical codes were determined by the researcher in line with the themes that developed through literature, the CAPS documents and the Guidelines for inclusive teaching and learning.

The documents were read in terms of their content meaning, followed by indexing and coding of the data to identify key themes and patterns. The coding analysis includes three specific outcomes: explicitly, potentially, and negatively. Through the analysis process of the documents, the researcher was able to determine if the expected outcomes in the CAPS document will either explicitly allow for music integration, potentially allow for it or it will be negative; where there is no room to integrate musical knowledge. In order for music integration to be successful, there needs to be a natural connection between Music and the other subject. The connection between the two subject areas is easy to establish and the association between them is clear and is not forced. The connections should be determined through comparison, researching different teaching strategies and analysing the expected outcomes. Through analysis, I was able to suggest ways of integrating musical knowledge in accordance with the National Standards for each year group in the Foundation Phase.

3.5 Ethical considerations

Creswell (2013) argues that ethical procedures have to be followed and specified in all qualitative approaches and in all phases of the research process, including the problem statement, research questions, data collection, analysis and interpretation, as well as in the publication and dissemination of qualitative reports. This study did not involve any human participants but is a secondary analysis of data as the purpose for examining existing

qualitative data published in music education research analysis is to present knowledge, interpretations, and findings supplementary from those presented in the original research reports (Hakim, 1982).

Only the prescribed CAPS documents for foundation phase were analysed and the interpretation of findings was based on possibilities of integration within the documents. All the research documents are in the public domain, accessible through the internet, and may therefore be consulted without the authors' or publishers' consent. The ownership of the original data is acknowledged and therefore a complete list of all the secondary documents used for this document analysis study is included (Tripathy, 2013). I attempted to adhere to the appropriate ethical norms by promoting the aims of research in the representation of knowledge, truth and academic impartiality, and by avoiding the falsifying or misrepresenting of the research data (Bresler, 1995). Although no human participants were used in this study, I followed the University of Pretoria's compulsory ethical clearance process. Clearance for this document analysis was granted with ethics number HUM025/1219.

3.6 Trustworthiness of the research

Triangulation was used to check the trustworthiness of the research. Triangulation uses multiple sources of data where it is compared and cross-checked. For this research, multiple methods, theories and literature were compared within the field of music education (Merriam & Tisdell, 2016). In postmodern research, researchers have recognised that there are more than three sides to research and have proposed the theory of crystallisation. Crystals come in numerous shapes and sizes, they are multi-dimensional and have different angles of approach, where what we see depends on our angle of response.

Meriam and Tisdell (2016) suggest researchers critically view their data and work from different angles to ensure trustworthiness.

3.7 Summary

This qualitative document analysis focused on the Foundation Phase CAPS documents, English home language, Mathematics and Life Skills. Through document analysis one was able to understand the expectations of the curricula, however the curricula are merely a guideline of what teach and how to assess learners and this affects the national and provincial standard of education. Through the coding process I was able to determine which activities and outcomes could explicitly or potentially incorporate music activities to enhance the learning experience.

Chapter 4: Data Analysis and findings

4.1 Introduction

The findings of this document analysis study are presented in this chapter and are based on the interpretation of the data collected from the Foundation Phase CAPS documents, which are the latest policy document for Mathematics, English and Life Skills.

These curricula aim to provide learners with the necessary knowledge and skills that will contribute to a well-rounded life (DBE, 2011b).

From the analysed data, three themes emerged:

1. Expectations from CAPS in the Foundation Phase
2. Integration
3. Effective teaching and learning strategies

These interrelated themes explain the main research question:

How can music integration enhance the teaching and learning of Foundation Phase Mathematics and English?

4.2 Expectations from CAPS in the Foundation Phase

Expectations in the Foundation Phase curricula include holistic development of learners in all subject areas, from motor and gross skills to performing with confidence. Holistic development stresses the importance of the psychological well-being, emotional and physical development particularly in early childhood. Music supports the concept of holistic development as music fosters fundamental and unique qualities, including creativity development, coordination, cognition, expression and social skills (Van Vreden, 2016). All subjects have a particular set of aims for each learner. The following sections will describe

the findings that explain the expected outcomes described in the curricula, the topics, time allocated, and assessment strategies.

4.2.1 Specific aims

In keeping with the curriculum, the aims of Mathematics include 1) developing critical awareness of mathematical relationships. 2) Confidence and competence to handle mathematical scenarios; 3) encouraging curiosity and a love for the subject; 4) appreciation; 5) recognising that Mathematics plays a creative role in human activity; 6) conceptual understanding; 7) acquiring subject relevant knowledge and skills in order to apply to mathematical problems and the study of subjects related to and can related subject matter and further study in Mathematics (DBE, 2011c, p. 8).

Both CAPS documents for Mathematics (DBE, 2011c, p. 13) and English Home Language (DBE, 2011b, p. 20) specify that the learning approach should be established on the philosophies of play-based learning and integration. According to English Home Language the: language is integrated in all subject areas. It is used throughout the curriculum in listening, speaking, reading and writing skills which will be developed in Mathematics and Life Skills (DBE, 2011b, p. 8).

The goal of Life Skills as a subject is to prepare learners for their future and its possibilities, for a meaningful and prosperous life in a fast paced and “transforming society” (DBE, 2011a, p. 8)

Life Skills offers learners a wide variety of knowledge, skills and values that strengthen their:

- physical, social, personal, emotional and cognitive development;
- creative and aesthetic skills and knowledge through engaging in dance, music, drama and visual art activities;

- knowledge of personal health and safety;
- understanding of the relationship between people and the environment;
- awareness of social relationships, technological processes and elementary science (DBE, 2011a, p. 8).

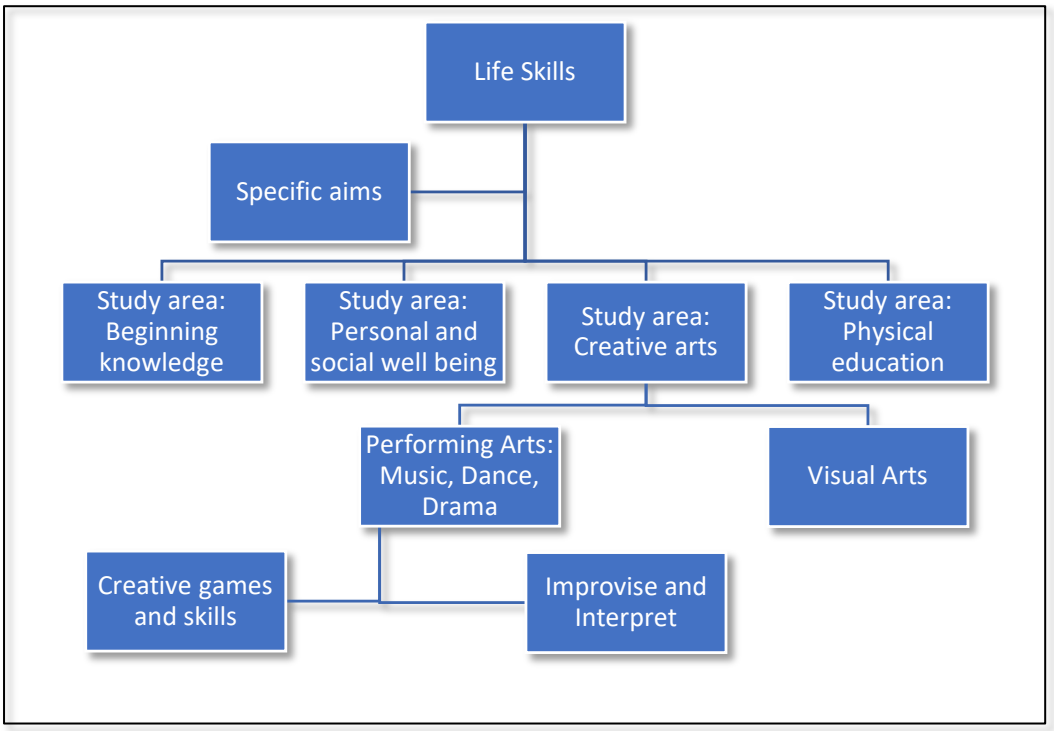
The data collected for the purpose of this study from the Life Skills CAPS document focuses on Music as a subject within Creative Arts which includes Performing Arts and Visual Arts. The overall aims for Creative Arts include developing creative, imaginative learners who will have an appreciation of the arts while focusing on basic knowledge and skills needed for Creative Arts (DBE, 2011a, p.9). Learners should be encouraged to discover and advance their creative thoughts built on their personal experiences. Emphasis should be on the growth of the skills through play and practical processes (DBE, 2011a, p. 9). These skills are crucial in developing and controlling the gross and fine motor skills (DBE, 2011a, p. 9).

4.2.2 Study areas, skill sets, and content areas

The Foundation Phase subjects are divided into various study areas (Life Skills), skill sets (English Home Language), and content areas (Mathematics). The learning objectives of the three subjects describe what learners should be able to achieve both intellectually and physically. One of the contributing factors to a successful Foundation Phase learning programme is for learning to be enjoyable (DBE, 2011a, p. 9).

Life Skills is organised into four study areas (Figure 4.1).

Figure 4.1 *The breakdown of Creative arts as study area*



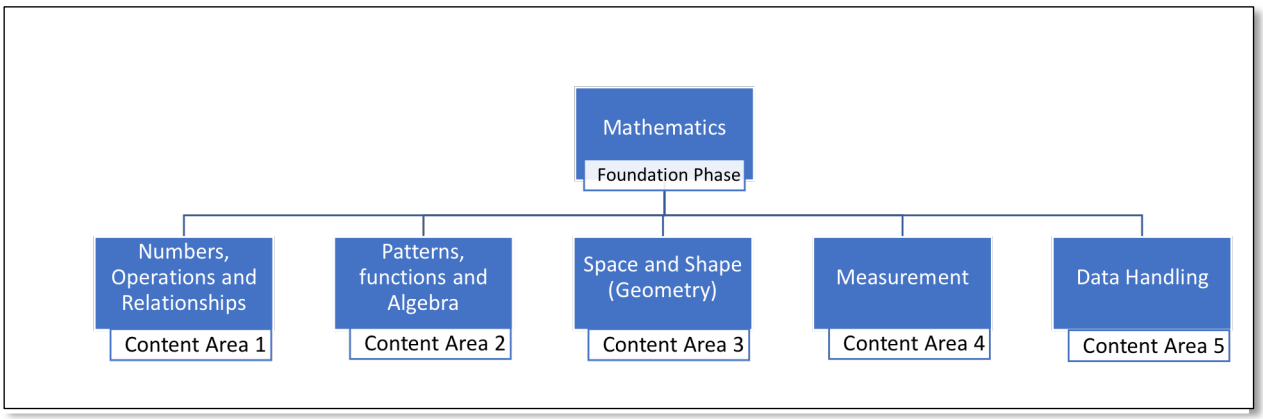
The study area, Creative Arts introduces learners to four art forms: Dance, Drama, Music and the Visual Arts. Music, Dance and Drama are organised under the Performing Arts umbrella (DBE, 2011a, p. 9). The objectives of Performing Arts as stipulated in the curriculum focus on stimulating memory, promoting relationships and building self-confidence and self-discipline (DBE, 2011a, p. 9). The main themes suggested by the curriculum are divided by grade and into two sections; “Creative games and skills” and “Improvise and Interpret” (DBE, 2011a, p. 9). The document indicates that “Creative games and skills” (DBE, 2011a, p. 9) prepares the body and voice to be used as means for developing their physical skills and creativity. “Improvise and interpret” (DBE, 2011a, p. 9) provide learners with the opportunity to create music, movement and drama both individually and collaboratively as well understanding and identifying how the metadimesions are used in the music. In Creative Arts, to represent Performing Arts, (Figure 4.2) the learners are introduced to dance, drama and music. Learners have the opportunity

to communicate, dramatize, sing, make music, dance and explore movement through different topics in a creative manner (see Table 4.4) (DBE, 2011a, p. 9).

'Creative games and skills' are used to develop listening skills. These activities and games can be both educator and learner centred. Interpretation gives learners the opportunity to think and listen critically to music holistically and focus on the musical elements.

The CAPS document for Mathematics focuses on five content areas as explained in Figure 4.2: numbers, operations and relationships; patterns, functions and algebra; space and shape (geometry), measurement and data handling (DBE, 2011c, p. 9). The objectives for teaching and learning Mathematics are: to create a mindfulness of the role that Mathematics plays in real-life and the personal growth in learners (DBE, 2011c, p. 8); appreciation and love for the subject; recognize that Mathematics is a creative activity with theoretical understanding; and developing the skills and knowledge needed for solving mathematical problems and for subjects with related subject matter (DBE, 2011c, p. 8).

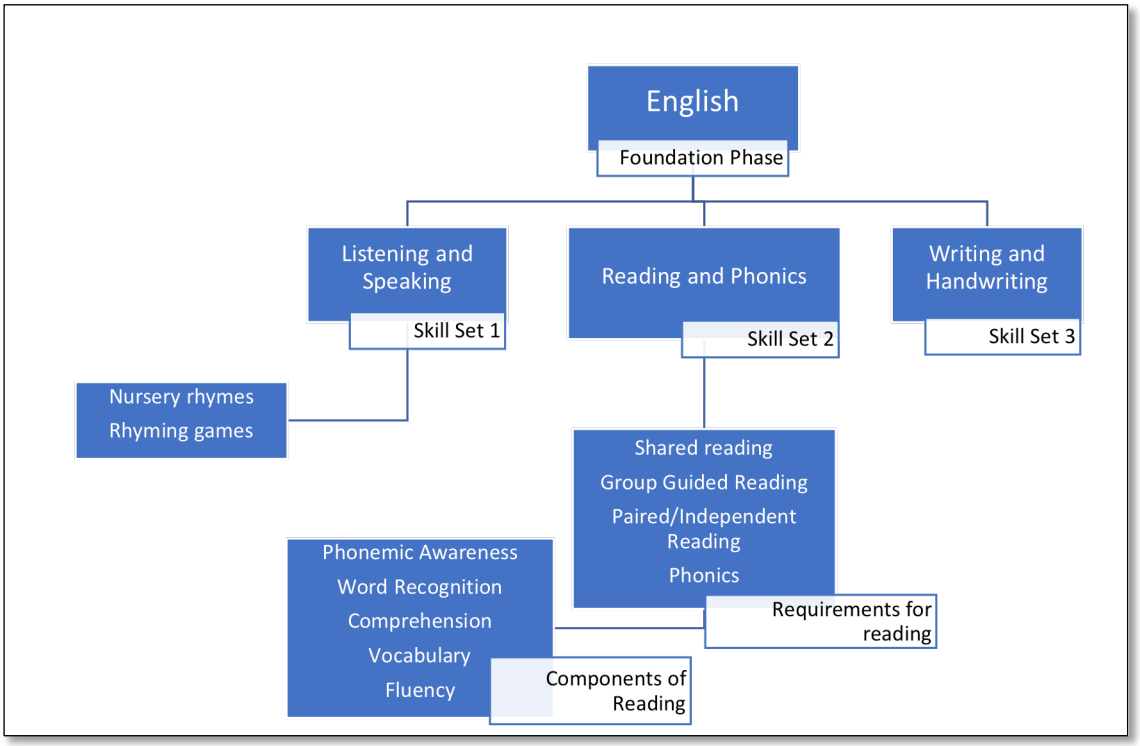
Figure 4.2: *The breakdown of Mathematics as a subject*



Similar to Life Skills and Mathematics, the English Home Language CAPS document focuses on three skill sets; Listening and Speaking; Reading and Phonics; Writing and Handwriting as indicated in Figure 4.3 (DBE, 2011b, p. 8). The aims for teaching and learning a language are different from Mathematics and Life Skills, as language is integrated into all subject areas.

The objectives for English as subject are: for learners to become competent readers and writers through the focus time and prescribed activities; as well as developing listening and speaking skills as these skills are necessary for all subject areas (DBE, 2011b, p. 10, 11)

Figure 4.3: *The breakdown of English as a subject*



The specific skill sets and objectives for English, content areas for Mathematics and the breakdown of Creative Arts in Life Skills have been highlighted from the Foundation Phase CAPS documents.

4.2.3 Learning content

Each of the subjects covers particular content and skills. The content is divided into topics and there are a number of topics that overlap, offering opportunities for integration. In line with the curriculum, Music in the Foundation Phase focuses on the following musical dimensions: (see Appendix A) pitch, duration, melody, rhythm, tempo, beat, dynamics, timbre, form, style and mood (DBE, 2011a, p. 36).

Table 4.1 shows the similarities of topics in Creative Arts, particularly for music across the Foundation Phase (DBE, 2011a, p. 9). According to the CAPs documents (DBE, 2011a) Life Skills (Table 4.1) are not divided in content areas but topics. Mathematics (2011c) (Table 4.2) uses content areas and English (2011b) (Table 4.3) uses Skill sets.).

Table 4.1: *Similar topics in Creative Arts (Life Skills) across the Foundation Phase*

Topic	Grade R	Grade 1	Grade 2	Grade 3
Creative games and skills: 1. Keeping a steady beat	✓	✓ With tempo changes	✓ body percussion	✓ Move in time with music using Locomotor and non-locomotor movements with co-ordinated arm
2. Exploring music	✓		✓ recognise mood; Create soundscapes to demonstrate character using dynamics, pitch, timbre and tempo	✓ Body percussion / percussion instruments to accompany local music focusing on rhythmic patterns and style
3. Singing songs	✓ action songs; dynamics	✓ focused on literacy and numeracy	✓ unison (pitch), rounds and call and response (form); literacy and numeracy	
4. Listening skills	✓	✓ tempo, pitch, dynamics and duration	✓ recalling contrasting rhythm pattern	✓ Listen to music focusing on tempo, dynamics and timbre South African instruments
5. Playing Rhythms		✓ Clapping games with partner	✓ Polyrhythms Playing percussion instruments	✓ Rhythm patterns, polyrhythms in 2,3 or 4 time recall contrasting rhythms, use different timbres
Improvise and Interpret 1. Sing songs with contrasts, dynamics and tempo		✓	✓ Explore musical elements (dimensions); by using words such as action words: 'chop-chop'	
2. Improvisation	✓ stories; add sound effects		✓ Create sounds and music for a particular character	✓ rounds; call and response
3. Exploring the senses/ elements of music	✓ Pitch Expressing moods		✓ Performing songs with various tempi and dynamics.	

Topic	Grade R	Grade 1	Grade 2	Grade 3
4. Note values and rhythms	✓	✓ Clap rhythms in three or four time	✓ Performing rhythm patterns with locomotor movements	✓ Listen to local music with the focus on rhythm Notated rhythm patterns containing various note values and rests using body percussion Create cyclic rhythm patterns centered on tempi and dynamic choices

According to the table above, there are a number of music dimensions that are introduced to learners in grade R and then built on throughout the Foundation Phase. The content areas of Music in Life Skills are divided into 'creative games and skills' and 'improvise and interpret'. The content areas of Mathematics are presented in Figure 4.2, while Table 4.2 introduces the topics as discussed in the CAPS Foundation phase curriculum (DBE, 2011c, p. 9).

Table 4.2: *Similar topics in Mathematics for grade R up to grade 3* (DBE, 2011c, p. 38).

Content Area	Topic
Progression in Numbers, Operations and Relationships	• Number concept development • Solve problems in context • Context-free calculations
Progression in Patterns, Functions and Algebra	• Geometric patterns • Number patterns
Progression in Space and Shape (Geometry)	• Position, orientation and views • 3-D objects • 2-D shapes • Symmetry
Progression in Measurement	• Time • Length • Mass • Capacity/Volume • Perimeter and Area
Progression in Data Handling (Not applicable to grade R)	• Collect and sort objects • Represent sorted collection of objects. • Discuss and report on sorted collection of objects

The main topics taught in Mathematics are referred to as Content Areas. CAPS for Mathematics include specific skills that develop vocabulary, number concept, calculation and application skills; listening skills, communication, thinking, logical reasoning and application of mathematical knowledge. Investigating, analysis, representation, interpretation, suggesting and solving problems (DBE, 2011c, p. 8).

Similar to Life Skills and Mathematics, Table 4.3 explains the focus of English Home Language CAPS document (see Figure 4.3) on three skill sets; Listening and Speaking; Reading and Phonics; Writing and Handwriting (DBE, 2011b, p. 8).

Table 4.3: *Topics covered in Foundation Phase English Home Language*

Skill set	Topic
Listening and Speaking	• Listens to stories • Acknowledge and follow instructions • Word sequences • Talk about personal experiences • Express feelings about a text • Use different parts of speech
Phonics	• Identify rhyming words • Recognises vowels and consonants • Identify syllables and sounds of words • Spelling words phonically • Recognise silent letters (grade 2 & 3) • Recognise letters in words • Spell words correctly using phonic knowledge (grade 2 & 3) • Prefixes and suffixes • Homophones (grade 3)
Reading	• Practice reading and character voice • Reading from pictures • Independent and shared reading
Handwriting	• Develop hand-eye coordination • Fine motor skills • Develops directionally: left to right, top to bottom • Copies patterns, words and letters • Forms lower- and upper-case letters correctly (grade 1) • Copies, writes and reads patterns, short sentences (grade 1-3)

Writing	• Draws pictures to convey message (Grade R and 1) • Contributes to ideas for a class story (Grade 1- 3) • Writes and illustrates a caption on a topic • Uses past and present tense (grade 1), grade 2 adds future tense • Builds own word band (grade 1- 3) • Punctuation

The English home language CAPS document includes various skill sets that are utilised and developed in all subject areas.

4.2.4 Activities

English (see Figure 4.3) is presented in the Foundation phase through the language skills; "Listening and speaking; reading and phonics and writing and handwriting". Language skills include reasoning and language structure. (DBE, 2011b, p.8). Themes and topics are chosen from subject areas to provide background for the teaching of language skills (Eng, p. 9). Prescribed teacher-guided activities (see Figure 4.4) are suggested for morning ring, particularly for Grade R but can be used across grades 1 -3. The morning ring generally has a particular subject as the focus, it provides an opportunity for learners to greet each other, share news, revise what was learnt the previous day. Depending on what educators would like to focus on, creative art activities, movement, music, perceptual and drama rings can have a particular focus in literacy and in refining reading skills including perceptual-motor concepts (DBE, 2011b, p. 20). A drama rings are similar to morning rings where the focus is on refining a topic or concepts including perceptual motor skills (DBE, 2011b).

According to the CAPS document the educator needs to play more of a mediator role rather than a facilitator (DBE, 2011b, p. 20). The curriculum advises educators to capitalize of incidental learning opportunities through child-centred activities. The Grade R daily schedule is structed in such a way that concerns relating to language, social, emotional and fine and gross motor skills will be exposed through the routines and activities (DBE, 2011b,

p. 22). These activities should provide opportunities for educators to “intervene and ‘mediate’ incidental learning that promotes emergent literacy” (DBE, 2011b, p. 20). Grade R has unique characteristics based on how this age group comprehends their world and acquire skills, knowledge, values and attitudes that will allow them to make the most of their formal learning years (DBE, 2011b, p. 20).

There are possibilities throughout the day for enhancing literacy learning; whether it be intentional planning, teacher-guided activities or because of “incidental learning opportunities” that happen throughout the day (DBE, 2011b, p. 20). Open-ended questions are encouraged to instil the desire to further their own learning. The daily programme in grade R is the timetable and includes three sections; “namely teacher-guided activities, routines and child-initiated activities or free play”. All of these components have the opportunity for incidental learning literacy skills (DBE, 2011b, p. 20).

The curricula of all three disciplines propose activities that will develop learners’ physical skills (gross and fine motor skills) and creativity (DBE, 2011a, p. 9, paras. 3,4). In an adaptable yet flexible daily programme, critical principles in early learning are consolidated, e.g. foundation phase learners learn best through movement (DBE, 2011b, p. 21).

In the Foundation Phase, Performing Arts allows learners to explore movement and dance (DBE, 2011a, p. 9). Improvisation and interpretation provide opportunities for learners to create movement collaboratively and individually (DBE, 2011a, p. 9).

The English curriculum proposes that learners should respond to stories through movement and drama activities or rings (DBE, 2011b, p. 33). To prepare for emergent reading movement development such as following a ball moving from left to right can be practiced (DBE, 2011b, p. 39).

Mathematics activities include and are not limited to the following; physical number ladder (DBE, 2011c, p. 20), copying and extending patterns by drawing the patterns (DBE, 2011c, p. 20, 24, 34, 47), and the collection of objects (DBE, 2011c, p. 34). Direction and position can be consolidated through colouring and drawing (DBE, 2011c, p. 49). Learners can describe and create their own "patterns by drawing lines, shapes or objects" (DBE, 2011c, p. 63). Word sums are generally used to introduce operations. Learners begin to solve problems by "using 'concrete apparatus' which develops into drawing pictures" (DBE, 2011c, p. 104). Strategies of addition and subtraction can be used when drawing pictures as it represents their thinking, calculation strategy and the solution (DBE, 2011c, p. 105)

As confidence grows, learners use apparatus to show their thinking and they record their calculations by drawing (DBE, 2011c, p. 109, 110). It is important for Mathematics to be presented as activity-based learning, especially for learners with barriers to learning. Practical activities focusing on gross motor skills such as physical movement can introduce language of position (DBE, 2011c, p. 49, 117, 200, 271) as well as rhymes with movement, games with movement words and songs (DBE, 2011c, p. 117) which can be enhanced during Language and Life Skills lessons (DBE, 2011c, p. 117). Learners could be asked to be show a physical pattern while counting beats. For example, on beat one, touch your head, beat two crossing over arms and touch your shoulders, beat three slap thighs and call out number three (DBE, 2011c, p. 129). During Creative games and skills (see Figure 4.4) musical dimensions are explored through movement and can be introduced through action songs focusing on the body to assist with interpretation and use of movement and the voice in stories and rhymes (DBE, 2011a, p. 22). Creative games focus on locomotor movements like hopping and skipping, sharing space and not bumping into peers (DBE, 2011a, p. 23), as well as using actions to stories in warm up movement (DBE, 2011a, p. 24).

During “improvise and interpret”, personal life experiences or fantasy stories can be improvised using movement to expressing moods and ideas (DBE, 2011a, p. 22). Creative movement and stories include the exploration of high, medium and low levels, directions and shapes. Drama and music activities include songs, nursery rhymes and the use of props and objects in movement and dramatic play (DBE, 2011a, p. 23). The data analysis of the curriculum, revealed opportunities to integrate these activities.

4.2.5 Content areas similarities

As explained in Table 4.4, there are numerous opportunities for natural integration within the Foundation Phase curriculum and this will be discussed further in chapter 5.

Table 4.4: *Similarities in Life Skills, Mathematics and English*

Subject	Topic or theme	Similarities
Life Skills – Music	• Note values and beat • Rhythm • Elements of music • Improvisation • Singing • Listening skills	<u>Integration of all three subjects:</u> 1. Note values, numbers, length and syllables Use words to work out number of syllables, create rhythm using the syllables. 2. Rhythm, patterns and syllables. Group same syllables together to create rhythms. Draw pattern, using shapes, each shape can represent a different note value which will create a rhythm. Learner plays own rhythm, swops with peers. 3. Listening skills Learning words to a song, identifying instruments, name an instrument that you would use to describe this word. Find an instrument that has x number of parts to it. E.g. djembe drum has one part, triangle has two. 4. Singing and build subject vocabulary in all subjects. Listen to singing – pitch and voice awareness. Numbers going up, pitch goes up, numbers go down, pitch goes down.

Mathematics	• Counting • Patterns, geometric and number • Problem solving • Shapes and 2D shapes, 3D objects • Time, length and mass • Perimeter and Area • Position, orientation and views • Symmetry • Collect and sort objects • Representation of objects. • Discuss and report on collection of objects	<u>Integration of Music and Mathematics:</u> 1. Counting Use note values and numbers to count in different multiples. 2. Identify patterns aurally and visually Identify the rhythmic or melodic pattern in the music which picture best represents what you hear? 3. Length of notes, how does tempo effect the time of a song/piece of music? How does the length of the notes affect your breathing when singing? 4. Make use of sorting games with note values, numbers and other symbols representing numerical values. Create rhythms using learnt note values. 5. Collect and sort instruments, classify how they create sounds. Look for similarities and differences between objects.
English	• Listens to stories • Listens and responds to instructions • Word sequences • Talk about personal experiences • Express feelings about a text • Use different parts of speech • Identify rhyming words • Recognises vowels and consonants • Identify syllables and sounds of words • Spelling words phonically • Recognise silent letters (grade 2 & 3) • Recognise letters in words • Prefixes and suffixes • Homophones (grade 3)	<u>Integration of Music and English:</u> 1. Listen to stories, create sound effects and background music to compliment actions. 2. Look for patterns and sequences in rhythm and lyrics. 3. Compose own song/lyrics about a personal experience 4. Discuss how certain genres of music express particular feelings. Use a ballad for sad or reflective emotion. 5. Identify rhyming words in songs and stories 6. Identify syllables and sounds in words. Use syllables to create rhythms.

4.2.6 Assessments

Assessments should be an ongoing process where educators identify, gather and interpret information on learners' performance, using various forms. The following four steps are involved: 1) producing and collecting evidence of learners' work; 2) evaluation; 3) recording; 4) using the data to comprehend and assist learners' development in order to improve the teaching and learning process (DBE, 2011c, p. 485). Assessments have been

described as “assessments for learning” which are informal and “assessments of learning” which are more formal testing. Emphasis is placed on regular feedback to learners so that the learning experience can be enhanced. Observation is the main form of assessing, oral discussions, practical demonstrations and written recording. According to the curriculum, Grade R assessments should be all practical (DBE, 2011c, p. 485).

4.2.6.1 Informal Assessments

Informal assessments are the continuous collection of data of learners’ abilities. Assessing should be seen as an integral part of learning. Informal assessments enable the educator to monitor learning progress and assist with making daily instructional decisions. These assessments provide opportunities for growth for learners with feedback and informs planning for teaching. The results are not taken into account for promotion purposes (DBE, 2011c, p. 485).

4.2.6.2 Formal Assessments

Formal assessments are marked and recorded in a formal manner by the educator. Formal assessments provide educators with a methodical way of evaluating learners’ progression in subjects and grade (DBE, 2011c, p. 485). Formal assessments mainly happen in small group focused sessions so the educator can assess a few learners simultaneously. All the usual materials that learners use should be at available for them to utilise. Assessments are required to be appropriate for both age and developmental stages. Formal assessments cover a spectrum of cognitive levels and abilities of learners. Subject content should be covered in tasks in more than one way. Learners should be given the opportunities to demonstrate their strengths and weaknesses in various forms of assessments. In order to get an accurate reflection of learners’ mathematical abilities,

language-based activities need to be avoided. Assessments vary depending on the age, skills and concepts that are being assessed. Observation checklists are useful to assess learners' abilities while rubrics are used to assess problem-solving skills (DBE, 2011c, p. 485).

4.2.6.3 Programme of formal assessment

Baseline assessments are encouraged in the first term. Results give an indication to where initial activities should be aimed and aspects of work that require more attention considering learners developing level Assessments during the year need to include all content areas and topics however, assessments can be formal or informal. Depending on the topics, criteria can either be assessed together or at different times. For example, if skip counting skills are being assessed, the ability to do the following could be assessed in the same exercise: 1) complete counting sequences; 2) read and write number symbols; 3) count (DBE, 2011c p. 486).

4.2.6.4 Moderation of Assessment

Moderation is the process of ensuring assessments are fair, reliable and valid. Moderation should be implemented various levels including national, provincial, district and school levels. Comprehensive and suitable moderation techniques must be present for quality guarantee (DBE, 2011c, p. 487).

Assessments in the Foundation Phase are generally more informal and through observation. Educators need to ensure that learners understand what is being taught (Wiggins, 2015). Teaching needs to be aligned with the assessments (Biggs, 2003). Assessment plans are suggested after each topic in the English CAPS document. Suggestions include formal and informal methods of assessing. The Life Skills document recommends assessment to be ongoing as well as regular feedback. The Mathematics curriculum provides the

requirements for assessments per grade (DBE, 2011c, p. 486). It is critical for assessments to be age and developmental level appropriate for learners.

4.2.7 Instructional time

According to the curriculum, a certain number of hours are allocated to subjects. Majority of the allocated time goes to the Home Language and Mathematics this is one of the reasons why they are considered core subjects. The allocation of instructional time is explained in Figure 4.5.

Table 4.5: *Instructional time in the Foundation Phase* (DBE, 2011b, p. 6)

SUBJECT	GRADE R HOURS (see Figure 4.4)	GRADE 1-2 HOURS	GRADE 3 HOURS
Home Language	10	8/7	8/7
First Additional Language	N/A	2/3	3/4
Mathematics	7	7	7
Life Skills • Beginning Knowledge • Creative Arts (30 minutes per subject) • Physical Education • Personal and Social Well-being	6 • 1 • 2 • 2 • 1	6 • 1 • 2 • 2 • 1	7 • 2 • 2 • 2 • 1
TOTAL HOURS	23	23	25

According to the instructional time in the table (Table 4.5) above; home language instruction time decreases from grade 1 and the first additional language receives more teaching time. Mathematics remains consistent throughout the foundation phase and Beginning Knowledge in Life Skills receives one more hour in grade 3.

A summary of the expected outcomes, topics, time allocation, assessments and recommended resources are indicated for English, Mathematics and Music in Tables 4.6, Table 4.7 and Table 4.8 below.

Table 4.6: *Summary of Mathematics according to CAPS* (DBE, 2011c, p. 9,10, 37, 96, 106)

Expected Outcomes/Skills	• develop the correct use of the language of Mathematics; • develop number vocabulary, number concept and calculation and application skills; • learn to listen, communicate, think, reason logically and apply the mathematical knowledge gained; • learn to investigate, analyse, represent and interpret information; (p8) learn to pose and solve problems; and • build an awareness of the important role that Mathematics plays in real-life situations, including the personal • development of the learner.
Numbers, operations and relationships:	Topics include: Counting, Number Recognition, Identify and describe whole numbers, Number sense, Solving problems Time allocated per week: 120 minutes
Patterns, functions and Algebra:	Topics include: Copy, extend and create own patterns Time allocated per week: 80 minutes
Space and shape (geometry):	Topics include: Recognise, identify and name 2-D shapes/pictures Geometric shapes, Build 3-D objects using concrete materials, Spatial Relations, Directionality Time allocated per week: 80 minutes
Measurement	Topics include: Time, Length, Mass, Capacity Time allocated per week: 80 minutes
Data Handling	Collect, sort, draw, read and represent data Time allocated per week: 60 minutes (from grade 1 -3)
Assessments	Informal and formal
Recommended resources	• Large dice, counters • A big counting frame, A height chart • Big 1 - 100 and 101 - 200 number grid posters • Different number lines (vertical and horizontal) • A set of flard cards (expanding cards) • Play money — coins and notes • A calendar for the current year • A large analogue wall clock • A balance scale, Building blocks, Modelling clay • A variety of boxes of different shapes and sizes • A variety of plastic bottles and containers to describe and compare capacities • Good examples of a sphere (ball), a rectangular prism (box), cube, cone, pyramid and cylinder. • A number of plastic or cardboard squares, different rectangles, circles, different triangles all of different sizes • Mathematical games, e.g. Ludo, Snakes and Ladders, Jigsaw Puzzles, Dominoes, Tangrams etc. • Essential for Grades R and 1: - Areas for sand and water play - Apparatus for climbing, balancing, swinging and skipping - A play-shop with items to be bought with play-money - A variety of appropriate games such as ‘what’s in a square’?, Blocks

Table 4.7 *Summary of Music (in Life Skills) according to CAPS* (DBE, 2011a, p. 8, 12, 13)

Expected Outcomes/Skills	• Develop learners to become imaginative and creative individuals who appreciate the arts. • Learners should explore and develop their creative ideas based on their personal experiences, using their senses, emotions and observations. • The introduction of these creative skills is essential in refining and controlling the gross and fine motor skills. • Creative Arts aims to create a foundation for balanced creative, cognitive, emotional and social development. In the curriculum, • Creative Arts is organized in two parallel and complementary streams - Visual Art and Performing Arts (Dance, Drama, Music).
Life Skills: Performing Arts - Music	Topics include activities for locomotor skills • Spatial awareness • Co-ordination • Tempo • Keeping steady beat • Creating rhythms • Vocal exercises • Duration • Time signatures, moving to and clapping different time signatures • Listening skills and describing music • Dynamics • Body awareness • Pitch • Timbre Time allocated per week: 30 minutes
Assessments	Continuous informal assessments Formal assessments
Recommended resources	open space • musical instruments, including found and made • audio and audio-visual equipment with a range of suitable music • charts and posters • variety of props e.g. materials, balls, different sized and shaped objects, old clothes • visual stimuli for drawing and construction. reading materials, instruments

Connections between music and other subjects will be discussed in section 4.5

Table 4.8 *Summary of English according to CAPS* (DBE, 2011b, p. 9, 10, 54)

Expected outcomes/skills	Children are constantly developing their language skills from listening and speaking to reading and writing in all subject areas. It is important that all languages skills are developed early in a child's academic life.
Listening and Speaking	Listening and speaking skills are developed in all subject areas. Topics are left to educators' interpretation Minimum time allocation per week: 45 minutes
Reading and Phonics	Reading is divided into the following areas: Shared Reading (including Shared Writing) • Group Guided Reading • Paired / Independent Reading • Phonics (including Phonemic Awareness) Minimum time allocation per week: 4 hours, 30 minutes
Handwriting	A pre-writing programme should be used to develop visual discrimination, gross and fine motor and hand-eye coordination, body image etc. They need to be taught the correct pencil grip, how to form the letters, the starting point, size, shape, and direction of movement. Minimum time allocation per week: 1 hour (changes to 45 minutes in grade 2 and 3)
Writing	Minimum time allocation per week: 45 minutes (changes to 1 hour in grade 2 and 3)
Assessments	Baseline assessment in term 1 Formal and informal assessments
Recommended resources	• Pictures and posters • Colour charts, Number charts, Alphabet charts • Games and toys such as blocks, construction toys, cars, dolls, puppets, masks etc. • Objects related to the themes and topics • Story board pieces, Story books and picture books, Big books - some produced in Shared writing sessions, Enlarged texts such as poems, songs, rhymes etc, Newspapers and magazines, Pictures to sequence • Jig-saw puzzles (at least 20 pieces) • Sand tray and water play items, Plastic bottles, jars, boxes etc. • CDs or tapes with stories (read or told), poems, rhymes and songs, CD player or tape recorder, television and video tapes/DVDs • Musical/ percussion instruments, e.g. a drum, bells, sticks etc. • Logos and relevant examples of environmental print • Flash card labels for classroom items and displays • Name cards for children • Pointers for both teacher and groups of children to use when reading enlarged texts, wall stories, displays • Fantasy corner, Theme table • Daily helpers' chart, Birthday and weather chart • Apparatus such as balls of various sizes, hoops, bean bags, pegboards and pegs, beads and laces, lacing cards and laces, nuts and bolts, clothes pegs • Materials such as scissors, plasticine or play dough, paint, paint brushes, wax crayons, chalk and slates or white boards and markers, Blank paper in various sizes (A3, A4, A5

4.3 Integration

The English CAPS document refers to the language programme which is integrated into other subject areas as language is used throughout the curriculum, including oral work, reading and writing. A number of Listening and Speaking language skills are advanced within Mathematics and Life Skills (DBE, 2011b, p. 8). Themes and topics can be chosen from these subject areas to provide background for the teaching of language skills. The CAPS document refers to integration which is used in grade R. Natural integration appears to be in all subjects however planning is required from educators for integration to be successful.

The integrated approach starts with the daily programme in grade R. The daily schedule is divided in to three main areas, teacher-guided activities, chid-initiated play and routines. In the CAPS document, English, Mathematics and Life Skills, the focus is on the expectation of grade R. One of the reasons for this is because it is the first year of formal education and all learner's education should start on solid foundation. Grade R has its own unique characteristics built on how these learners comprehend their world and how knowledge, skills, attitudes and values are developed. The daily programmes emphasize free play. The educator should look for 'teachable moments' depending on learners' interests and creativity (DBE, 2011b, p. 20).

There are numerous opportunities for learning literacy in a daily plan which is balanced and adaptable while supporting ways that the young children learn (DBE, 2011b, p. 21.). Kinaesthetic learning and three-dimensional learning, learning with concrete materials is encouraged in Grade R before more formal learning techniques in Grade 1 (DBE, 2011b, p. 21).

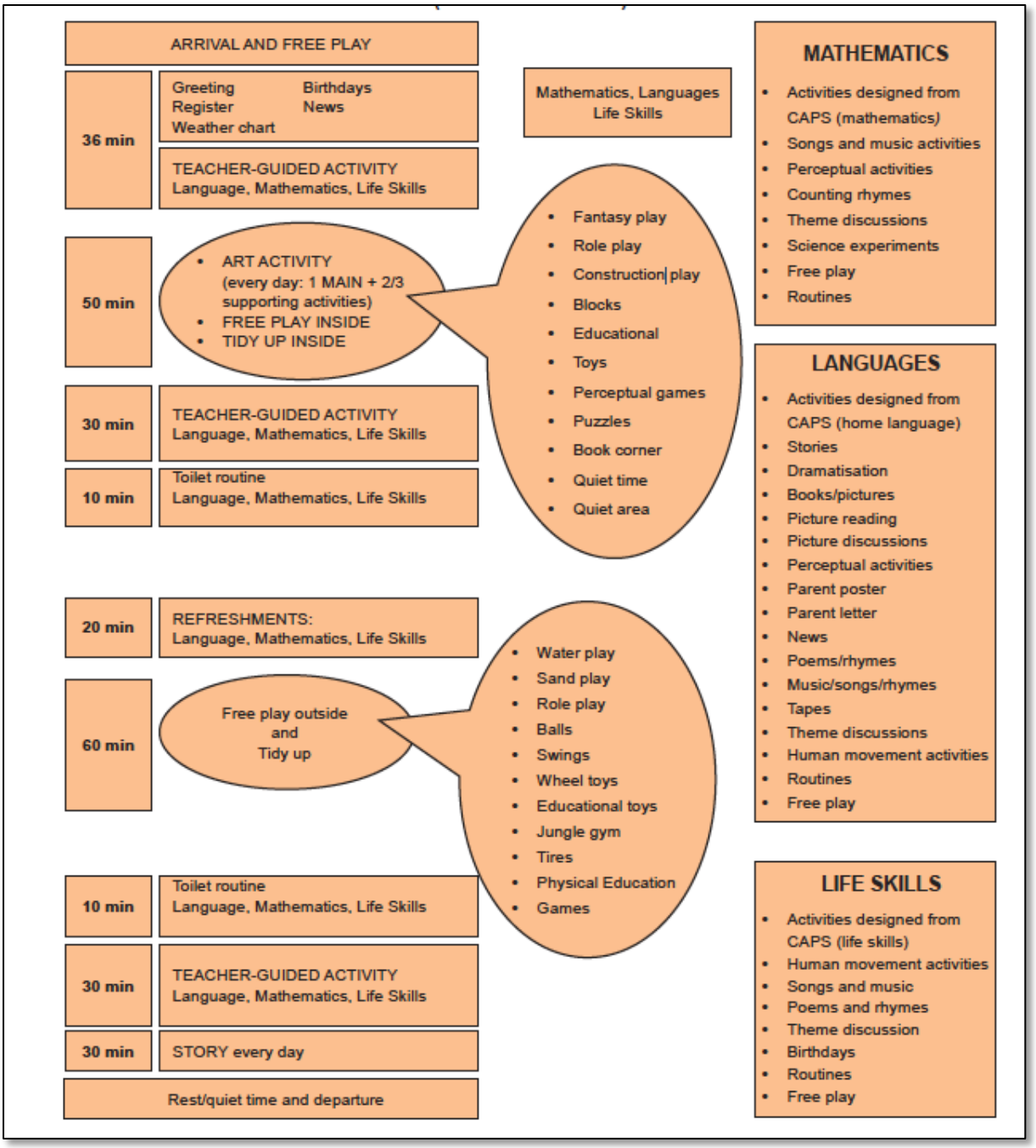
An integral part of developing numeracy includes cognitive development (problem-solving, logical thought and reasoning) (DBE, 2011c, p. 13) language development (language of the

subject) and perceptual motor as well as emotional and social development. All aspects, from cognitive to social development, can be developed through stories, songs, finger games and rhymes, exploration activities and imaginative play (DBE, 2011b, p. 132, DBE, 2011c, p. 13). Mathematics can be taught in a number of ways from ring time where children can count the number of learners at school, talking about the date and the weather (Maths, p. 14). Creative art activities can also contribute to Mathematical learning where you can use shapes to design patterns or make a collage (DBE, 2011c, p. 24,34, 46, 60). Colour activities can be used to promote the acquisition of mathematical concepts such as sorting, grouping and classifying (DBE, 2011c, p. 13.). Learning potential can only be maximised according to the educator's knowledge and initiative (DBE, 2011c, p. 14). This is one of the reasons why educators require better training in Creative Arts to encourage and assist learners in their own learning. Structured free play can be used to teach mathematical concepts (DBE, 2011c, p. 13, 14). Outdoor free play such as climbing a ladder or riding a bike develops mathematical vocabulary such as up and down, fast or slow, bottom and up (DBE, 2011c, p. 12). Sand and water play can advance the conceptualisation of mass, capacity and volume. These activities promote fundamental perceptual motor skills, which contribute to the development of both literacy and numeracy.

Grade R should promote logical thinking skills including problem-solving and reasoning, as well as co-operative learning and negotiation. By making the most of teachable moments, an educator can encourage learners to reflect on their decisions, think deeply about issues, find good reasons for their choices and predict possible outcomes. All aspects of Grade R can be used to develop vocabulary and encourage a positive attitude towards learning. The focus of Grade R is all about the development of the learner using all their senses. This brings about holistic development which highlights the aim of CAPS. There should be a focus

on informal and spontaneous learning throughout the day. The Grade R daily programme as explained in Figure 4.4, is based on the principles of integration and play-based learning (DBE, 2011b, p. 22). As seen in Figure 4.4, free play is included in the daily programme in Languages, Mathematics and Life Skills and encourages discover learning before formal learning begins in Grade 1.

Figure 4.4: *Daily programmes - Grade R*



"Life Skills is a cross cutting subject that should support and strengthen the teaching of the other core Foundation Phase subjects namely Languages (Home and First Additional) and Mathematics" (DBE, 2011a, p. 8). According to Life Skills CAPS, "Beginning Knowledge and Personal and Social Well-being in the Life Skills curriculum are organised in topics. The use of topics is suggested as a means to integrate the content from the different study areas where possible and appropriate" (DBE, 2011a, p. 14).

As reported by the CAPS document the approach to Mathematics particularly in Grade R, should be built on the aims of integration and play-based learning (DBE, 2011c, p. 13). The educator should utilise a range of child-centred activities such as free play for example, sand and water play activities as well other-guided activities that focus on mathematical concepts (DBE, 2011c, p. 13). Various games could include aspects of numeracy, for example measuring during cooking or counting during shopping (DBE, 2011c, p. 13). Creative art activities could also focus on mathematical topics, for example, using geometric shapes such as circles and squares to make a collage or designing a pattern to frame a picture. It is the educator's knowledge and initiative that can maximise learning potential. 'Teaching music across the curriculum proposes a pedagogical approach to teaching and learning by integrating thoughts, actions and attitudes' (Campbell & Scott-Kassner, 2010:370). Grade R educators lack confidence and are unsure of how to integrate music into the daily programme due to lack of skills, knowledge and inadequate training (Van Vreden, 2016, Russell-Bowie, 2009b). The grade R educators play a critical role in integrating music into the daily programme as they know their learners, the curriculum and the best time for teaching music. (Campbell & Scott-Kassner, 2010). Russell-Bowie's (2009b) research revealed challenges that educators face in South Africa include a lack of personal musical

skills and experience, time for lesson preparation, consolidating musical knowledge according to the curriculum and prioritising music as a subject.

4.4 Teaching and learning

Teaching and learning refer to the style of how educators teach and how learners learn. The learning style theory of multiple intelligences proposed by Gardner (1993) suggests that the different ways we learn best are determined how we perceive the world around us. The Department of Education published *Guidelines for Inclusive Teaching and Learning* (2010) which provides recommendation for teaching and learning strategies striving for all learners to be inclusive, regardless if there is a disability.

4.4.1 Perceptual learning

Perception skills (DBE, 2011b, p. 133) use the senses to acquiring data about the surrounding, situation or environment. The development of these skills happens throughout all learning. Educators should focus on the development across all study areas in Life Skills as well as English and Mathematics.

4.4.2 Multi-level Teaching

Multilevel teaching is an approach that considers the “principles of individualisation, flexibility and inclusion for all learners, regardless of their skills levels” (DBE, 2010, p. 58). Educators should include all learners in class activities even if they experience barriers to learning. Multilevel teaching supports lessons with different approaches of learning, teaching and assessment so all developing levels are considered. The lesson must include a variety of teaching styles for learners of all levels. This means; considering various learning styles when planning lessons; involving learners through questioning at different levels of thinking referring to Bloom’s Taxonomy (DBE, 2010, p. 59). Recognise that some learners

will need amended expectations; learners can choose a technique depending on their capability in demonstrating knowledge, skills and values. Various methods should be seen as equal value as well as assessing learners in terms of their differences (DBE, 2010, p. 59).

4.4.3 Co-operative learning

Cooperative learning encourages learners to work together to ensure that all learners have learnt the same content. These activities connect to social constructivist learning approach where groups and tasks are structured to promote working together to reach a common goal, solve a problem or make a decision (DBE, 2010, p. 62).

Table 4.9: *Characteristics of effective cooperative learning activities* (DBE, 2010, p. 63).

Characteristics	Explanation	Method
Face-to-face interaction	Learners should interact directly with one another when carrying out collaborative activities.	The seating arrangement should allow face-to-face interaction (e.g., a circle). Various modes of communication should be provided to facilitate proper interaction.
Equal opportunity for success	All learners should have the opportunity to contribute to the success of a group.	Barriers to learning educators should adapt the criteria for success and expectations according to the learners' needs.
Individual accountability	Learners should learn to take responsibility for their own learning and contributing to the group.	Learners are allocated various tasks
Interpersonal skills	To ensure a range of interpersonal and social skills are learned, including communication, leadership and decision-making skills.	Learners should be encouraged to value other learners' contributions. As well as listening to each other and to take turns in discussions, and not to dominate.
Learner reflection	Learners evaluate their groups performance and whether their goals were achieved by the end of the lesson.	Learners raise problems experienced and what they learnt from the exercise. Learners write about the challenges and how they overcame the obstacles
Positive interdependence	The accomplishment of the group goal should depend on all group members working together and coordinating their actions.	Each learner should be encouraged to participate fully or partially in group activities.

The above-mentioned strategies can provide educators with more insight on how to include all learners in the classroom, regardless if there is a learning problem. It is critical for teachers to be able to adapt their teaching strategy to include all learners as well as exposing learners to different learning styles in order for them to reach deeper understanding.

4.5 Conclusion

The key findings include similar topics across the subjects throughout the Foundation Phase which opens up the possibility for integration. There are efforts within the curriculum where 'connections' were made between music and the particular subject. The Grade R teaching approach is idealistic of integration as the educator's role is more of mediator than facilitator. In grades 1 – 3, the educator can be either facilitator or mediator depending on the activity and subject. Limitations found in the CAPS document are the differences across the three curricula, lack of teaching and learning strategies, assessment rubrics and subject specific skills. If educators are equipped with sufficient training and are able to identify the natural connection or relationship between Music and Mathematics and Music and English by studying the CAPS document and understanding the expected learning outcomes, then using music as a means to teach the topics should be possible.

Chapter 5: Discussion and Conclusion

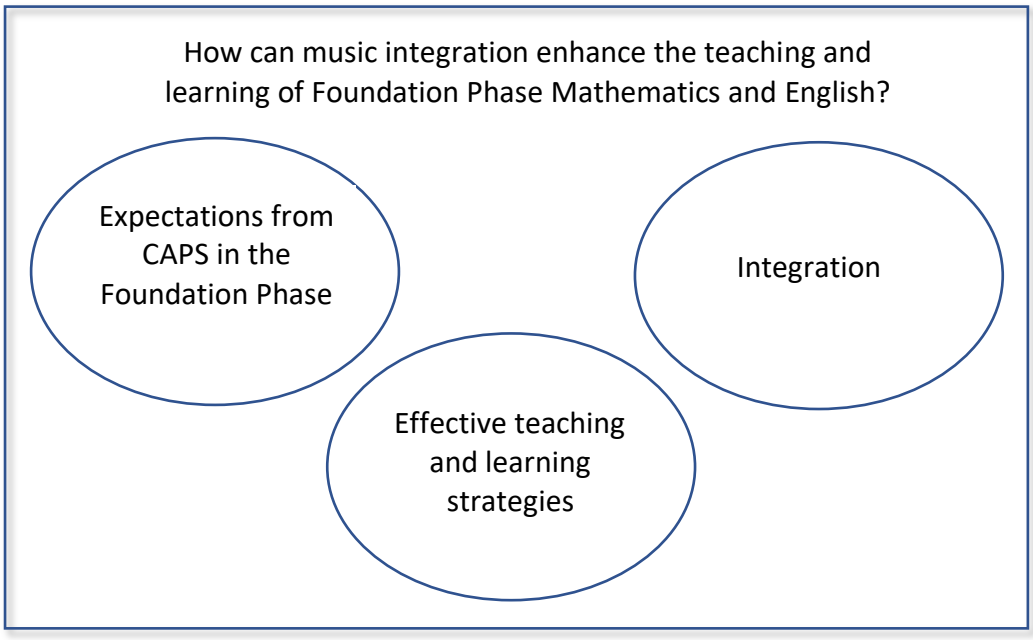
5.1 Introduction

This study set out to explore the idea of incorporating musical activities in English and Mathematics, and to gain a deeper understanding of the expectations from the prescribed curriculum. The CAPS documents were analysed alongside literature to identify the possibilities for music integration. The discussion and conclusion are presented in this chapter and are based on the interpretation of the data collected from the latest Foundation Phase CAPS documents for Mathematics, English and Life Skills. These curricula aim to ensure that learners obtain and apply knowledge and skills that will meaningfully contribute to their lives (DBE, 2011b).

From the analysed data, three themes emerged (see Figure 5.1)

1. Expectations from CAPS in the Foundation Phase
2. Effective teaching and learning strategies
3. Integration

Figure 5.1: *Three themes that emerged from the findings*



5.2 Expectations from CAPS in the Foundation Phase

The CAPS documents mainly provide guidelines and suggestions on the content that needs to be taught in each year group. There is an expectation that all educators receive the same or similar training during their studies however according to literature, educators lack confidence and the necessary skills to teach the arts (Jansen van Vuuren & van Niekerk, 2015; Russell-Bowie, 2009a). The intended outcomes of the documents are reasonable and clear as pointed out in the expectations of the learning outcomes. Educators should have a clear idea expectation of what the learners will gain from the lesson. Referring back to Biggs (2003) steps in 'constructive alignment', the CAPS document provides educators with the intended learning outcomes and skills sets for each subject. The teaching and learning activities are mainly left to the educators' interpretation however the topic and general idea are provided in the documents (DBE, 2011a; 2011b; 2011c). Examples of teaching guidelines are stipulated in the Mathematics CAPS document (DBE, 2011c). Suggestions for assessments are offered after each skill set in the English CAPS document (DBE, 2011b), teaching guidelines as well as suggestions for assessments are provided in the Mathematics document (DBE, 2011c). Assessments in the Life Skills document (DBE, 2011a) have been described as 'a continuous planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment. It involves four steps generating and collecting evidence of achievement; evaluating this evidence; recording the findings and using this information to understand and thereby assist the learner's development in order to improve the process of learning and teaching' (DBE, 2011a, p. 66). The assessment guidelines offer educators the necessary parameters to ensure a final grade for learners. In an ideal teaching and learning environment education across the country should be of the same standard. The CAPS documents leave room for

educators to interpret the lesson plan according to their understanding and strengths and what is appropriate for the context of the school. However, due to this individual interpretation and different levels of pre-service teacher training it is nearly impossible to ensure that a national standard of teaching will take place which also makes it more complicated to ensure constructive alignment (Biggs, 2003) takes place. The CAPS documents lack guidance on different teaching strategies according to learners preferred method of learning and only includes suggestions for teaching grade R and barriers to learning. According to literature a good curriculum requires the following aims of the course; expected behaviour of the learners; expected outcomes; topics; time allocation; suggested teaching and learning methods; assessments and recommended resources (Reece & Walker, 2007). CAPS meet some of the requirements of a good curriculum. The aim of the curriculum is clearly stated at the beginning of each document. Expected behaviour of learners is not included in the document. Outcomes, and topics are covered in content, concepts and skills as well as time allocation and recommended resources. Suggestions for both formal and informal assessments are included as well as examples of questions in the Mathematics document. The suggested teaching and learning methods are exceptionally brief and research found educators are not aware of alternative teaching strategies (Mohd Meerah et al., 2010).

It is important that the teaching approaches and assessments are aligned with the learning activities in the expected outcomes (Biggs, 2003). Educators' can include 'constructive alignment' in their planning process. The intended learning outcomes needs to be the focus throughout the planning process, from selecting the topic or theme which is stipulated in the CAPS documents to deciding on the learning and teaching activities and the form of assessment. By focusing on the ILOs throughout the planning process, educators should be

able to see the relationship between the theme, activities and assessments. When there is a clear understanding of what the end goal is and how you can get there, it is easier to follow the steps. It cannot be stressed enough how important it is for educators to be constantly keeping in mind the intended learning outcome and ensure that everything they do to assist the learners is in line with the ILO.

5.3 Effective teaching and learning strategies

The learning approach for Mathematics and English should be founded on the ideologies of integration and play-based learning. Learning should be enjoyable and natural connections should be made between subjects. The objectives for teaching and learning Mathematics are to highlight the role Mathematics plays in real-life scenarios and the individual growth of learners (DBE, 2011c, p. 8); appreciation and love for the subject; to recognize that Mathematics is a creative activity; a solid foundation and understanding of mathematical concepts to help make sense of the subject; and to acquire the skills and knowledge needed for solving mathematical problems and for subjects with related subject matter (DBE, 2011c, p. 8).

The main objective for teaching and learning English is for learners to become proficient readers and writers in the language as well as develop the necessary language skills needed for a successful academic life (DBE, 2011b, p. 10). The skills of reading, writing, listening and speaking are also developed in other subject areas such as Mathematics and Life Skills.

The objectives of Performing Arts in Life Sills as stipulated in the curriculum focuses on stimulating memory, promoting relationships and building self-confidence and self-discipline (DBE, 2011a, p. 9). The main themes ‘creative games and skills’ should prepare the body and voice and be used as tools for developing their physical skills and creativity.

'Improvise and interpret' (DBE, 2011a, p. 9) provide learners with the opportunity to create music, movement and drama both individually and collaboratively as well as understanding and identifying what is happening in the music.

In the table below (Table 5.1) Gardner's Multiple Intelligences are compared to the perception skills according to the CAPS document. Gardner's theory (1993) (see 1.1, 2.2.1, 4.4)) emphasizes that learning experiences have a connection to particular intelligence and the way people solve problems and develop skills. This is where educators need to be able to implement various learning and teaching methods in the classroom to ensure all learners have equal opportunities in learning (Gardner, 2011). Educators need to be able to incorporate all the perception skills in their teaching.

Table 5.1: *Gardner's Multiple Intelligences compared to the Perception skills in CAPS* (DBE, 2011a, p. 11, 12)

Gardner's theory	Perception Skills in CAPS
Visual and Spatial Intelligences	• Visual Perception – obtain and interpret information through the eyes – enables learners to read and write. • Visual discrimination – ability to see similarities, differences and details of objects accurately • Visual memory – the ability to memorise what the eyes have seen and in the correct sequence • Spatial orientation – comprehending the space around the body or relationship between the object and observer. • Figure-ground perception –focus on a particular object or feature while ignoring all other stimuli, the object is in the foreground
Body Kinesthetic	• Hand-eye co-ordination – hands and eyes working together to perform a movement • Body image – complete awareness of owns body • Laterality – being aware of both sides of the body • Dominance – preferring to use one hand or side of the body • Crossing the mid-line – being able to work across the vertical mid-line of the body
Verbal and Linguistic	• Auditory perception – obtain and interpret through the ears – enables the learner to give meaning to what is heard. • Auditory discrimination – ability to hear similarities and differences in sounds • Auditory memory – ability to remember that the ears have heard and the correct sequence

Teaching and learning strategies should incorporate Visual and Spatial intelligences which focus on the reading and writing and the space around the learner. These learners learn best when they are able to see and perceive what they are being taught. Body-kinesthetic intelligence learners require physical movement when learning, from crossing the mid-line to being aware of their own body. Verbal and Linguistic intelligence refers to aural perception which enables the learner to comprehend what they have heard.

Wium and Louw (2011) researched how educators can facilitate language skills with the aid of Speech therapists. Findings indicated that the level of learners' performance in literacy and numeracy is worryingly below standard. The quality of education in South Africa is far below the expected standard and particularly in the foundation phase. Literacy is an essential aspect in the foundation phase curriculum (Motshekga, 2010) as language is the basis for learning (Owens, 2004). The curriculum needs to be implemented correctly to develop the necessary language skills to ensure learners are able to read, write and perform basic mathematical calculations by the end of grade 3 (Wium and Louw, 2011). The results from the study indicated that it is beneficial for educators to support one another and there is value in co-teaching (Wium and Louw, 2011).

5.3.1 CAPS and Constructivism

When comparing CAPS to constructivism, it is evident that CAPS could potentially give more suggestions on how learners can achieve the expected outcomes. The outcomes are highlighted in suggested assessments after each new topic. Constructivism highlights the importance for educators to inform learners of the expected outcomes so they are aware of the goal they are working towards. This provides the learner with an idea of what they are working towards and enables the learner and educator to work together to reach the

expected outcome (Scruggs, 2009). The learner completes the work that they are already able to perform and the educators offers support if necessary. One of the principles that the CAPS document is based on is *active and critical learning* (DBE, 2011b, p.4) which encourages an engaging and critical approach. The curriculum aims to mould learners who are able to:

- identify and solve problems and make decisions using critical and creative thinking;
- work effectively as individuals and in a group setting;
- organise and manage themselves and their activities responsibly and effectively;
- collect, analyse, organise and critically evaluate information;
- communicate effectively using visual, symbolic and/or language skills in various modes;
- use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation. (DBE; 2011b, p. 5).

The last aim goes hand in hand with the constructivist approach, as learners need the skill of recognising problems and relating them to previous experiences and knowledge. Learners need to be actively engaged with the content and the experiences in the lesson and the educator needs to consider their strengths and weaknesses (Scruggs, 2009). In grade R, learners build on their strengths and challenges in an integrated approach (DBE, 2011b). Self-evaluation is in line with constructivism as assessment is incorporated into the

learning process. This gives learners the opportunity to have a more active role in determining their own progress (Brooks and Brooks, 1999, as cited in Scruggs, 2009).

5.4 Integration

In order for true integration to take place, or in the words of Russell-Bowie (2006, p.26) 'Syntegration', all subjects need to share a 'common theme'. The theme needs to be planned with integrity, where educators also use authentic learning experiences of preferred intelligences to deepen learners' understanding (DeMoss and Morris, 2002; Russell-Bowie, 2006).

By presenting the topics with music integrated activities, learners are exposed to various teaching and learning styles as well as the various multiple intelligences.

Chapman (2015) adopts the term 'Arts Immersion' from McDonald and Fisher (2006), who define the term as the combination of "arts integration and language immersion" (Chapman, 2015, p. 93). Arts integration refers to effective links accompanying the arts and connecting other subjects through the arts to communicate new knowledge.

Chapman (2015) describes the arts as a language. The process of language immersion has the ability to enhance language skills through the means of using a second language as agent for teaching content. The 'immersion language' is viewed as a means for acquiring language and curriculum content simultaneously (Chapman, 2015, p. 93). This is a strategy that can improve learning for shared benefit in the arts and other disciplines. Language becomes the means for developing literacy and is therefore crucial to the development of literacy skills. "It functions as a means of communication, which is manipulated and interpreted within the practice of literacy" (Chapman, 2015, p. 94). Through Arts Immersion,

the arts become the “language of choice – the means for communication, investigation and expression” (Chapman, 2015, p. 94).

Arts integration from the literature refers to an arts specialist and an educator who work together on large projects that last between four – six weeks in order to achieve a higher level of learning. This kind of integration generally occurs in the Intermediate or Senior Phase. Music integration in this research context is one teacher, the generalist Foundation Phase educator who can utilise musical activities in the English and Mathematics lessons. Before generalist educators will be able to incorporate music integration into their lessons, it is essential that they have a good understanding of concepts and qualities of music. Especially since music integration is applying musical understanding as a teaching method. Training of generalist educators should address: basic music literacy; deep understanding of how to encourage the development of conceptual understanding of music in others and their relationship to concepts in Language and Mathematics; detailed examples of lesson plans; examples of how to go about integrated music into lessons; and development of skills to create own lesson plans. Generalist teachers should learn how music learning experiences should be designed to enable effective listening, performing and creating experiences. Singing exercises and skills and instrumental playing activities should also be incorporated into the training. Generalist teachers should learn how to include activities that involve movement to support the body in communicating understanding of musical ideas.

The music activities are used as a means or an aid to assist with the learning process while highlighting common themes across subjects. Meaningful learning objectives need to be reached in both subjects, either English and Music or Mathematics and Music. Music

integration emerges from arts integration as it includes all the art forms, where music integration focuses solely on using musical activities to enhance the learning experience. The next section discusses the findings in the CAPS document for integration in Mathematics and English.

5.4.1 Findings of Integration in Mathematics CAPS

Referring to Perger et al.'s (2018) comparison of the concepts of patterns in music and in mathematics and the topics from the CAPS document, indicates the possibility of teaching patterns in Music and Mathematics by means of integration and a deeper understanding of the topic will be made as well as a holistic learning experience.

5.4.1.1 Mathematics and Music

The findings in the Mathematics CAPS document support the use of music to enhance learning experiences (DBE, 2011c, p. 13, 15, 115,126). However, the curriculum lacks examples of true integration and uses music as a means to support the understanding of the mathematical concept. Patterns are a key concept throughout the curriculum and are explained under the common theme number and geometric patterns (DBE, 2011c, p. 38, 47,48). Pattern repetition supports development of early algebraic concepts (p. 9). Music is a language on its own as it uses both verbal and non-verbal methods to communicate meaning (Perger et al., 2018). Algebra relates to patterns, whether it be making, finding, continuing or describing (Ministry of Education, 2007). One of the main ideas of music integration is to "develop and enhance mathematical abilities and skills by means of cross-cutting themes with the help of music education and music activities" (Hudáková & Králová, 2016, p. 291).

Research shows an increase in the theories of utilising music to enhance the mathematical principles such as spatial reasoning, sequencing, patterns, counting, one-to-one correspondence and problem solving (Geist et al., 2012; Gruhn & Rauscher, 2002; Sposet, 2008). Developmental psychologists and constructivists learning theorists claim that music can change the way learners think as it allows for significant connections and various illustrations of concepts (Chrysostomou, 2004; Medina, 2002). Using music as a learning medium for mathematical concepts is a form of 'enacted pedagogy,' an idea that is influenced by the educators' understandings of the subject (Taylor & Bailey, 2011, p.90). This is one of the reasons why educators need to have the subject knowledge and confidence in teaching both music and mathematical concepts. Mathematics is an evolving

learning process that is influenced by learners physical, social and emotional state and music has a significant responsibility as it contributes to the well-being and stimulating the learning environment (Geist et al., 2012; Paquette & Rieg, 2008). According to the principles of Dewey (Dewey & Jackson, 1990), there is a natural inclination in the physiological response to music, which provides a foundation for learning. Children naturally respond to the mathematical concepts in music such as pattern, form, symmetry and sequence (Hasan & Thaut, 2004). The key to successful teaching with activities that involve both mathematics and music is allowing learners to engage in the lesson and promoting the fun aspect of learning (Geist et al., 2012, p. 76). Mathematical vocabulary and topics can be taught using musical activities that may be viewed as an imaginative and enjoyable method (Goulder & Lodge, 2008) and to present visual methods that connect concepts and symbols (Lynch, 2007). The major claim between music and memory is linked to the fact that songs are repetitive and memorable and are stored as both speech and musical codes (Lake, 2002; Samson & Zatorre, 1991). Trinick et al. (2016) addresses 'recall versus conceptual thinking' where the use of music is used as a prompting aid with chants and songs (p8). Music enriches the learning environment by encouraging participation and assists with recall however, there is still a need for learners to attain a deeper understanding of the mathematical concepts. (Hiebert, 2013; Trinick et al., 2016). When music is used as a tool for teaching mathematics, learners need to be conscious of the mathematical experience if true understanding is to be achieved (DeMoss & Morris, 2002; Kassell, 1998; Russell-Bowie, 2006). An example of An et al.'s (2013) exploratory research on integrating music into mathematics, is linked to the five phases of a Music-Mathematics lesson: **Phase one:** introduce the pentatonic scale by playing and singing the scale. Demonstrate playing the notes in different orders with long and short note values to create various melodies. **Phase**

two: show the connection between the music and mathematics objective. The music objective is to compose a melody using the pentatonic scale, using one note per side of the shape, learners can improvise their own rhythm for their melody. The mathematics objective is drawing a 3-D shape of the learner's choice. Learners show their understanding of shapes by identifying and naming various shapes and explaining the differences and similarities between 2-D and 3-D shapes. **Phase three:** Explain how melodies are also lines, if it is a straight line It will be the same pitch the, if the lines goes up, the melody line will go up in pitch etc. Explain how each line of the shape represents a line of the melody. **Phase four:** Emphasise mathematics concept, assign tasks based on learner's work. Each learner will have a different melody depending on how they have drawn their shape. If the shape is small it will have a quieter dynamic, if the shape is large, the learner will use a louder dynamic in their performance. **Phase five:** Highlight mathematical concept and take learner's understanding to a higher level. Learners' perform their shape melody. Learners' show be able to see the connection of lines and melodies and how melodies exist in everything. Learners can also describe instruments by comparing them to the 2-D and 3-D shapes that they have learnt.

Music-themed mathematics lessons need to support the approach of understanding mathematics within the context of music activities. On the pedagogical level, educators have used Gardner's (1993) multiple intelligences theory to both explore and explain mathematics teaching strategies while integrating music activities and content as an educational resource. These music themed activities have provided learners with an emotionally stimulating mathematical learning context which helps reduce the anxiety that comes with the subject (An & Tillman, 2015; Eisner, 1991; Upitis & Smithrim, 2005). Since concerns regarding learners' understanding of mathematical concepts, educators are

encouraged to research and embrace new and different styles of learning. (Perger et al., 2018)

Table 5.2: *Mathematical concepts and integration*

Content Area	Concept	Integration
Numbers, Operations and Relationships	Counting Doubling and halving	• Use number rhymes and songs to count forwards and backwards, count everyday objects, mental mathematics • Number games: recognise, identify and read number symbols 1 - 10 • Solve verbally stated addition and subtraction problems with solutions up to 10. • Doubling and halving, note values. Demonstrate understanding and applying the concept of doubling and halving numbers and note values. • Use fractions including halves, quarters, eighths, thirds, sixths, fifths – note values – American terminology
Patterns, Functions and Algebra	Patterns: Geometric and numbers	• Patterns are represented in different forms and all senses can be used to show understanding of visual and aural patterns • Complete and extend patterns represented in different forms, writing rhythms and melodies. Analyse simple melodies and identify patterns, whether it be melodic or rhythmic. • Simple patterns made with drawings of lines, shapes, or objects, Identify and describe patterns in rhythms and melodies • Create patterns with physical objects. Look for patterns on various instruments, for example, guitar, xylophone and piano. • Describe own number and music patterns
Space and Shape (Geometry)	Space and shape	• The concept of space and shape includes following directions around the classroom. • Moving from learning the language of position and matching different views of the same objects to reading and following directions on informal maps – using songs and graphic notation. • Use songs to follow directions to move around the classroom. Orff method can be used for this activity. If anyone is standing on the left side of the room, clap twice. If you are on the right side of the room, whistle for 4 counts. • Use songs to recognise and name 2D and 3D shapes • Symmetry in own body and in geometrical and non-geometrical shapes, symmetry in pictures, Symmetry through paper folding and reflection

Content Area	Concept	Integration
Measurement	Measurement: Length of time	• Learners can measure the length of time using note values and various tempos and relate to time. Move around the classroom using various tempi and note values. • Use music to compare lengths of time using language e.g. longer, shorter, faster, slower • Time – 12-hour clock
Data Handling	Sorting, representing and describing	• Data handling includes sorting and drawing various objects and answering questions on how they were sorted. Grouping instruments together, how does the instrument make its sound? Do the instruments look similar? What do the instruments have in common?

When learners complete the Foundation Phase, they should have a good understanding of number sense and be fluent with all content areas. The aim is for learners to be both confident and competent with numbers and calculations. Learners should be exposed to mathematical experiences that provide opportunities for them to actively engage with the concepts, have an understanding of the concepts, develop the necessary terminology and be able to write and work with numbers, patterns properties and features of shapes. Measurement includes new forms of measuring; new measuring tools, and formal and informal tools. Both calculations and problem-solving concerning measurement should be aware of the number work that has been taught. The main progression in Data Handling from Grade 1 is achieved by progressing to working with data; as well as the new forms of data representation. The full data cycle which includes collecting, organising, representing, analysing, interpreting and reporting data should be worked through by learners.

5.4.1.2 English and Music

The ANA, Annual National Assessment, report from The Department of Basic Education states that music supports the development of literacy and therefore music is an essential aspect of the curriculum. Music instruction is able to embody both phonics and whole language approaches through various methods (Steyn, Schuld & Hartell, 2012). Perger et al. (2018) suggest that singing is used to enhance the learning of one particular subject, and nothing is learned about singing as an activity to understand music. More often than not the lyrics are the most important part of teaching a song to a class, especially when taught by a generalist educator. Vocal warmups, correct technique, aural skills, pitch and analysis are not the focus of the lesson. When singing it is important for young learners to move to the beat and feel the steady pulse of the music. Choose a simple song with repetitive sections to assist with memory and learning, The vocal range of the song should be limited to help singers sing on pitch. This is particularly true when trying to incorporate English and music. Song and rhymes are used to increase memory and teach learners about a number of different life skills, such as personal hygiene. Throughout the CAPS documents, there are common themes. Patterns are one of the main themes in all three subjects: English, Mathematics and Life Skills. Patterns can be used in the following ways: in English, language patterns and drawing patterns in handwriting, spelling and rhythmic patterns (DBE, 2011b, p. 23, 29); and in music (DBE, 2011a), rhythmic patterns and movement patterns (DBE, 2011a, p. 34, 47, 58). Rhythmic patterns in music have the potential to be taught alongside syllables and spelling patterns in English.

Table 5.3: *English concepts and integration*

Skill Set	Concept	Integration
Listening and Speaking (1) Use language to develop concepts in other subjects.	• Listens to stories and poems and acts them out, expresses feelings about the story • Listens to and repeats rhythmic patterns and word sequences and copies correctly • Sings simple songs and does action rhymes • Matches and sorts items according to shape, colour • Names and points to parts of the body – use song • Listens to instructions and responds appropriately • Role plays different situations • Uses terms such as sentence, capital letter, full stop • Repeats a sequence of events in the story correctly • Recognises rhyming words, makes up own rhymes using imaginative language • Tells simple stories, riddles and jokes varying tone and volume of voice	• Rhythmic patterns – use syllables and words to assist with playing rhythms. • Developing language and knowledge, music can be used to enhance memory as well as building the capacity to learn languages more effectively, songs are generally catchy and assist with increasing attention span. • Matching items, instruments, according to appearance and how they produce sound • Use Orff method of teaching music to teach listening to instructions and responding. Using various percussion instruments, educator gives certain instructions to one a group, and then different instructions to another group. The Kodaly method can used to introduce pitch with hand signals and assist with repeating sequences. • Dynamics and pitch used to assist telling stories, jokes and riddles • Use music for role playing; one group are the strings while another group is brass. What kind of story is the music telling?
Reading and Phonics (2)	• Recognise that words are made up of sounds • Acts out parts of a story, song or rhyme. • Identify rhyming words in well-known rhymes and song • Responds to stories through movement and drama activities or rings • Use memory skills to recall items seen such as letters, shapes or concrete objects • Reads own and others writing • Reads with increasing fluency and expression • Recognises that some sounds represented by a number of different spelling choices	• Syllables and number of sounds, match note values to syllables in words. Crotchet = walk; quavers = running • Read lyrics and rhythms. Use syllables and note heads to help with reading lyrics and rhythms. • Read own writing

Skill Set	Concept	Integration
Handwriting and Writing (3)	• Develops fine motor control, eye-hand co-ordination • Copies patterns, words and letters • Writes a simple poem or song	• Develop fine motor skills through instrument play • Copy note values, rhythms • Write poem or song, work out the natural rhythm

Content from the three CAPS documents that allows for integration in teaching and learning language, music and mathematics will be explained in the following section.

5.4.1.3 English, Mathematics and Music.

Focused activities for listening and speaking skills from the CAPS for language can be integrated with music. One of the recommended activities includes listening to and clapping back rhythmic patterns. This activity focuses on the universal skill of listening that is utilised in all subjects. Teaching songs assists with recalling simple word sequences in a particular order. From the CAPS Mathematics, Measurement as content area allows learners to contrasting various quantities by using comparative words such as taller/shorter or heavier/lighter (DBE, 2011c, p. 88, 183).

Similar integrated content areas are visible in music and mathematics. In the content area of **Numbers, Operations and Relationships** note values can be introduced from working, drawing and identifying the different values alongside numbers learnt in mathematics (DBE, 2011c, p 19). Addition can be used as a means to write rhythms, starting with simple duple time and working up to simple quadruple, learners will have the opportunity to demonstrate their understanding of both numbers, starting off with 1 and 2 and then working up to 4, as well as different note values as confidence is gained. Number rhymes and songs can assist with more than just learning numbers, it can support mathematics vocabulary and memory skills. Learners' understanding of numbers and note values can be consolidated through worksheets and games of addition and subtraction.

In the content area of **Patterns, Functions and Algebra,** patterns can be taught by using numbers and note values. By creating a rhythm, learners will also be given the opportunity to identify patterns aurally. Patterns can be used in rhythms to strengthen understanding of note values, identify both visually and aurally, reading different rhythms and looking for similarities. Graphic notation can also be utilized to represent patterns, graphs and tables. Describing patterns assist learners in advancing their language skills as well as the ability to identify similarities and differences in patterns both visually and aurally, while offering learners the opportunity to demonstrate their understanding (DBE, 2011c, p. 19).

In the content area of **Space and Shape (Geometry)** images of various percussion instruments can be used to highlight the visual similarities and differences in their shape and how they create sound in different ways (DBE, 2011c, p. 37). Learners should recognise and describe objects and shapes in their surroundings using applicable vocabulary that resemble music objects and shapes. There are a number of opportunities for generalist foundation phase educators to utilise music integration in their teaching of Mathematics and English. Topics that can be covered in Mathematics include counting in note values, multiples of 1 and 2, identifying the length of notes, identifying patterns, collect and sort instruments. English topics include bringing stories alive by creating sound effects and background music; identify patterns in rhythm and lyrics; identify rhyming words and number of syllables in songs and stories.

5.4.1.4 Life Skills

Life Skills covers a number of themes such as matter and energy; earth and universe; science, technology, geography, history, living things, man and his environment (Life Skills, p.8). These themes can create awareness and appreciation of world music and practice on real life situations (Le Roux, 2014). A number of skills can be developed through this subject namely emotional skills, decision-making, social skills through group work, motor, perceptual and learning skills which help mould a competent, responsible and thinking individual (Le Roux, 2014). Singing and dancing can underline vocabulary development as well as reading, with the aid of pictures, symbols and graphic notation. Music can contribute to the learning of languages through poetry, dramatisation, storytelling, sharing and singing (Le Roux, 2014).

"Topic connection" brings two subjects together due to the characteristic of one enriching the learners' understanding of the other (Wiggins, 2015, p.207). *Thematic connections* are the most common form of integration in curricula. A theme must be chosen because it is genuinely connected to concepts and process that include each discipline involved.

"Authentic connections" underline the way people understand and actively participate in different disciplines to give multidisciplinary work a strong aim. These connections can develop through concepts and processes of the disciplines (Wiggins, 2015, p.208). Processes includes classification, comparison, generalisation, description, negotiation, interpretation, analysis and evaluation. Concepts such as relationship, change, cause and effect, pattern, interdependence, structure, value and intensity and expression are also common across majority fields. Understanding a concept or process in one subject area can enhance and support understanding in another. This highlights the importance of understanding how educators actively participate and understand the content (Wiggins, 2015). If connections

between the different subject areas can be brought to the exterior and considered, the process could enable learners to use process understandings from one subject to enhance their work in another. Interdisciplinary thinking and working requires a subject expert. Conceptual connections represent when learners understand a concept in one discipline, it allows them to reason about the possible connections of a particular concept to another. When learners can find differences across subject areas, their understanding reaches a more in-depth level.

Le Roux (2014) suggests the use of song as integration as it reinforces what has been taught. For example, learners can use their understanding of numbers and money values through music to solve mathematical problems. This echoes Wiggins' (2015) findings that it is important for learners to relate their newly acquired knowledge to an experience: "Learning is meaning making. Learning is making connections.

5.5 Musical understanding

Elliott (2005, p. 7) explains that "musical understanding involves many closely related kinds of thinking and knowing." Hallam and Papagerogi (2016) summarise the opinions of many music educators (Burnard, 2000; Davidson, Scripp, & Welsh, 1988; Dibben, 2001; Glover 1990; Haack, 1990) who argue that musical understanding embodies the breadth and context of engagement with music and is constructed individually. Campbell (2005) and Wiggins (2015) also conclude that conceptualisation of music occurs within a specific culture. In South African schools, music is learned from a Western perspective that mostly includes participating in the musical processes of listening, performing and creating. To learn, individuals make meaning of experience by making connections to understandings they already hold" (Wiggins, 2015, p. 8). Le Roux (2014) highlights the fact that the

curriculum emphasizes principles instead of facts. The curriculum is the 'head, hands and heart' (p. 51) to give a holistic education which combines knowledge, skills and values. Le Roux (2014) also recommends teaching musical concepts (dimensions) through the exploration of opposites, for example, loud and soft or fast and slow. Music conceptualisation is an ongoing process that includes many sensory experiences**.** Learning music through a conceptual approach facilitates musical thinking. The concepts become tools for perceptive listening, performing and creative movement. Improvisation offers learners the chance to demonstrate their understanding of music and the opportunity to express themselves (Le Roux, 2014). The CAPS documents include teaching opposites in music such as high and low pitches, fast and slow tempi and loud and soft dynamics. Learners need to experience the concepts on the physical level or the *enactive* first and then on the *iconic* level where expressing understanding through images or verbal descriptions that are not yet labelled. Once the concept is understood they can move to the *symbolic* level where labels and names are introduced (Bruner, 1966; Wiggins, 2015). For example, once learners understand melodic contour by representing the shapes of the music with their body and hands, they can transfer that understanding to graphic representation. Activities are left to the educator's interpretation according to the schools' context, which can be viewed in either a positive or negative manner. Educators that have experience with the subject will likely put more effort into their lessons as they are more confident with the subject matter whereas an educator whose only music experience is in a short course, will less likely put as much effort into the planning of the lesson. Van Vreden (2016) refers to music as an art form that is integrated with values of play, exploration and practical experiences. Musical experiences both support and strengthen the teaching of core subjects (Van Vreden, 2016). These musical experiences include experimenting with elements of

music such as tempo and dynamics through singing, how to handle and play percussion instruments, learning about musical concepts that relate to aural perceptual skills and cognitive development which includes pitch, tempo and articulation, aural and listening skills are developed (Campbell & Scott-Kassner, 2010). Van Vreden (2016) proposed a conceptual framework for music integration in Grade R. Her proposed framework includes teaching and learning music in various ways; *about* music, *in* music, *on* music, *through* music, *with* music and *from* music. *About* music focuses on passing on knowledge of musical concepts and music is the focus of the activities. The aim of this teaching method is to broaden musical knowledge without experiencing music as an art form. *In* music reinforces musical experiences. Music is the product and the goal for the activities is all music based. The aim is to experience, apply and consolidate musical elements directly. *On* music relates to Snyder's (2001) *Symmetric correlation* and is directly linked to musical concepts. The activities are accompanied by music, but music does not determine the way in which an activity is performed. *Through* music uses musical activities to determine teaching and learning and are used for non-musical learning. A topic can be enhanced though a song which creates a particular atmosphere and does not relate to another subject. With music activities do not necessarily have a music connection. This is the preferred teaching style amongst grade R educators which relates to *Service Connections* (Snyder, 2001, Russell-Bowie, 2009b) model of integration where the music material is used to support an outcome of another subject. Van Vreden (2016) believes musical development is encouraged even when the learning outcome is not musical. For example, when learners' sing a song to strengthen a theme or topic, their singing voices are still used to explore and recognise various pitches in the melody. When these songs are performed, 'unintentional musical development' takes place (Van Vreden, 2016:8). *From* music teaching and learning

generally happens spontaneously once learners have been given opportunities for free play where they can explore their musical understanding in an informal manner. Van Vreden (2016) concludes that educators will be able to use aspects of music integration with confidence by selecting teaching opportunities for the conceptual framework and applying them in the daily programme.

5.6 Lesson Plans

When designing the lesson plan, the generalist educator needs to consider the following; a) choose musical context; b) choose the element of music to study in the chosen work; c) choose primary means of engagement or activity (performing, creating, listening); d) choose appropriate context of activity, whole-group, small-group, pair or independent work; e) means of assessment built into the experience (Wiggins, 2015, p. 71). Focusing on music integration, one way to plan the lessons is to focus on the problem or the learning outcome. Wiggins (2015) suggests the following method to 'planning the problem'; a) what will learners be learning; b) what activities will learners be engaging with in order to learn; c) through what music learners will be learning; d) how the learning will be organized; e) how the educator will know that learning has taken place. In the words of Aprill (2007), to ensure the quality and integrity of musical experiences are maintained and remain an asset for learners, careful consideration needs to take place during the preparation stages. Music is universal, it exists in all cultures, music opens the window to the working of the brain, music matters in general education – studies have shown improvement in marks when learning an instrument. Music has the potential to "level the playing field in public education" (Scripp, 2000, p. 6). Musical study is able to promote connectedness in the brain and internal musical practice may be as engaging as external musical practice (Begley, 2000 as cited in

Scripp, 2000). Chapman (2015) implies that the quality of learning in an already full curriculum can be increased through the use of music integration.

The preferred model for integration being a combination of Bresler's (1995) *coequal cognitive approach* and Russell-Bowie's (2009a) *syntegration*, viewing the arts as equal participants in learning. Both generalist and specialist educators should relate to introducing and facilitating integrated arts curricula (Chapman, 2015).

The prescribed curricula for the Foundation Phase have the possibilities to enhance teaching and learning with the means of musical activities for various reasons; findings highlight similar topics across the three subject areas; the use of different teaching and learning strategies add to holistic development of learners. There are many possibilities for teaching Mathematical concepts, however it does not need to be integrated into all topics.

This study set out to investigate how Music can enhance teaching and learning in the Foundation Phase Mathematics and English. The result of this study should benefit generalist educators who lack confidence and the training to teach music in Life Skills to create their own lesson plans.

5.7 Conclusion

From this research, three main themes emerged from the document analysis of the CAPS documents for the Foundation Phase, namely; Expectations from CAPS in the Foundation Phase; effective teaching and learning strategies; and Integration. The expectations of the curriculum lean more to guidelines and suggestions of how educators can cover and achieve the outcomes of the curriculum. CAPS does not provide sufficient teaching and learning strategies that complement the holistic learning and critical thinkers that they aim to achieve. Limitations found in the CAPS document are the differences across

the three curricula, lack of teaching and learning strategies, assessment rubrics and subject specific skills. There is a level of natural integration across subjects in the curriculum however, learning will improve if educators awareness of integration increases. By adopting the constructivist approach to learning which complements musical understanding, and using a more appropriate lesson plan, learners and educators will benefit from integrating musical activities into Mathematics and English. By using an integrated approach to teaching, a holistic education is encouraged with equal weighting between subjects. Campbell and Scott-Kassner (2010) describe skills that are developed when music is used as a tool for playing, moving rhythmically and socializing. When music is integrated into the curriculum, learners and educators experience learning as both intellectually and emotionally stimulating this is because integrated learning promotes creativity (Russell & Zembylas, 2007).

Chapter 6: Recommendations

The final chapter begins by answering the research question. The limitations of the study, as well as recommendations for future research are discussed.

6.1 Answering the main research question

This study aimed at answering the following research question: *How can music integration enhance the teaching and learning of Foundation Phase Mathematics and English?*

Primarily this research highlights the expectations of teaching and learning strategies and integration as explained in the CAPS documents.

Furthermore, the contributions in literature that already exist with regard to arts integration (Barrett, 2001; LaJevic, 2013; Silverstein & Layne, 2010; Snyder, 2001;), the benefits of music integration (Colwell, 2008; Jansen van Vuuren, 2018a; Russell-Bowie, 2006; Scripp, 2000; Wiggins, 2001), musical understanding (Campbell & Scott-Kassner, 2014; Hallam and Papagerogi, 2016; Le Roux, 2014; Wiggins, 2015), teaching and learning strategies (Gardner, 1993; LaJevic, 2013; Liao, 2016; Russell-Bowie, 2006) including constructivism (Marlowe & Page, 2005; Parker, 2007; Scott, 2012; Vygotsky, 1980), status of education (Holden and Button, 2006; Jansen van Vuuren 2018b; Makeleni and Sethusha, 2014; Hartell et al., 2013) and curriculum design and lesson plans are highlighted (Banks and Banks, 2013; Bresler, 1995; Campbell and Scott-Kassner, 2014; Jansen van Vuuren, 2018a; Russell-Bowie, 2006, 2009b).

The research findings lead to an understanding of the expectations of the national curriculum and that it will be beneficial to both learners and educators if integration was

more dominant in the curriculum. It will add to the holistic approach, which will create a deeper understanding through the constructivist theory.

This study suggests that generalist teachers in the Foundation Phase will benefit from this study as they are required to teach Life Skills which includes music. These learning experiences should also benefit learners who will be able to connect relevant concepts and topics across different subjects.

6.2 Limitations of the study

Limitations of this study include focusing only on arts integration, the CAPS documents for Foundation phase, using English as the only language for integration. Focussing only on music is also a limitation, because music is only one of the Life skills study areas (other study areas are dance, drama, visual arts).

6.3 Recommendation for further research

The initial purpose for this study was to explore the possibility of incorporating musical activities with similar topics in English and Mathematics to create deeper understanding of the concepts. To further this study, one could design a quasi-experimental study which includes a teacher training program, lesson plans with integrated music activities as well as a pre-test and post-test comparison design for the learners.

Another suggestion would be to research the following:

- how can educators' training and the curriculum of an education degree be adapted to ensure educators' have the necessary means to teach all the subjects effectively?
- How can the curriculum be adapted to ensure learners get the best quality education?
- Are the more direct relationships between English and Music?

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Appendix A

Dimensions of music	Rhythm - long and short notes, patterns of sounds and silences
	Meter – organisation of the beat into what
	Tempo – speed of the music
	Melody – the tune you sing, series of pitched notes Pitch – high, low or notes that are the same
	Harmony – different notes played together to build up chords
	Articulation – how the sound sources are played
	Dynamics – volume of the music including loud and soft sounds, volume can increase and decrease.
	Timbre – also known as tone colour. The quality of sound produced by different vocal and instrumental sources and the way the sounds are produced. (i.e. what is the instrument made of, how does the instrument produce its sound).
	Texture – arrangement and number of voices
	Form – repetition and contrast also described as structure. same or different sections, different parts of the music (i.e. Verse, chorus, bridge, theme, motif, coda or ending).
	Style – how dimensions are combined to produce style characteristics in the music

(Wiggins, 2015; Russell-Bowie, 2006)