A comparison of software-based staff notation and indigenous memorization methods in teaching the *nyunga nyunga mbira*

by

Richard Muranda

A mini-thesis submitted in partial fulfilment of the requirements for the degree

Master of Music (Music Technology)

in the

Department of Music

University of Pretoria

Supervisor: Prof C Van NieKerk

December 2010

Abstract

The research was based on a comparison of traditional African and software-based staff notation methods in the teaching of the *nyunga nyunga mbira* to two grade six classes in the Arts and Culture learning area at Pretoria Chinese School in South Africa. The experiment involved 30 pupils whom the researcher exposed to the *nyunga nyunga mbira* an African musical instrument. The classes had 15 learners each with grade 6L as the control group and grade 6M the experimental one. The research was conducted during the Arts and Culture lessons from 9 September 2010 to 10 November 2010.

The *nyunga nyunga mbira* tune Kukayiwa with four variations was taught to both the control and experimental groups. Whereas the control group was taught to play the instrument through the rote method, the experimental received instruction using the computer-assisted approach. Proceedings in each of the teaching sessions were diarized. Audio and video recordings and photographs of pupils' activities were also undertaken. An assessment of the pupils' performance in both the control and the experimental groups was done to ascertain the effectiveness of each of the methods being researched. The results showed that both methods were effective in the teaching of the *nyunga nyunga mbira*. In terms of pupils' performance the methods had the same impact upon the learners. However, the pupils in the control group started off with a better performance than their counterparts in the experimental group. The experimental group became more consistent than the control group towards the end of the research.

The research findings also indicate that the pupils involved in this research liked the inclusion of the *nyunga nyunga mbira* in the Arts and Culture lessons. The instrument proved that it could fit well in the core components of the Arts and Culture learning area which are art, dance, drama and music. The *nyunga nyunga mbira* music performed during the research was effective in storytelling, dance, movement and drama, especially with the extra afternoon session learners. Even though the computer-assisted method began to yield consistent performance among the learners it was concluded that neither of the two methods was better than the other. Nonetheless it is recommended that further research be conducted and more time be allocated to this kind of research to verify the method that may hold more advantages for the learners in the performance of the *nyunga nyunga mbira.*

Dedication

This study is dedicated to my late wife Rita Vimbai for having been a pillar of strength. If only you were there you could have reaped the fruit of your resilience and tenacity in support of all my academic endeavours.

Acknowledgements

I would like to convey my heartfelt gratitude to my supervisor, Professor Caroline van Niekerk, for her relentless endeavour to keep me focused on this academic vocation. I also render my sincere appreciation to Dr Zenda Nel for her supportive role both morally and materially. I am also deeply indebted to my dear friends Pastor Charles and Juliana Magaiza for their prayers, social, material and financial support. These worked for me; I appreciate that. For all the information and academic counsel I salute my colleagues in academia in Zimbabwe and South Africa, notably Mr Perminus Matiure and Mr Jerry Rutsate. May God richly bless the Principal of the Pretoria Chinese School, Mr Gavin Budd, Mrs Vivienne Pieters, the Arts and Culture teacher and all the all the grade six pupils of the school for allowing me to conduct my research with maximum support. May the blessings of God be upon you all.

LIST OF FIGURES

LIST OF TABLES

LIST OF EXAMPLES

CONTENTS

CHAPTER 1

RESEARCH OUTLINE

1.1   Introduction to the study

The following teaching methods such as the rote, tablature and staff notation have been proposed in many ways to help the acquisition of skills in playing musical instruments in schools, especially in the General Education and Training (GET) curriculum in South Africa. Some of the methods used in music education generally include Kodály, Suzuki, Orff and Dalcroze, as well as some African indigenous ones which include the apprentice and the inheritance. Some methods are applicable specifically to the teaching of western musical instruments especially tablature and staff notation, and not much has been done to develop methods that focus on tuition of African instruments. It is quite common, especially in schools where Music is a formal subject, for teachers to avoid teaching traditional instruments because there is no standardized approach to use. The experimental research design is meant to develop modern methods in teaching African instruments, taking advantage of current developments in technology. The learners of today are exposed to a variety of information through the internet, television, radio, cell phones, multimedia video games, film and on-line social interaction with peers. The various forms of information technology available give the learners increased chances to manipulate gadgets and reinforce their knowledge base.

A variety of software packages that simulate or are used to help the teaching of many musical instruments are now available. Though software packages cannot wholly replace human instruction, they certainly bring a difference in the traditional ways underlying the philosophy of indigenous African methods of instruction. As a result it is necessary to find ways on how to use the available resources in enabling the acquisition of skills in performing indigenous music instruments.

Bruner (1961) advocates that all learning experiences should be relevant to the level of the learner. However, this means that learning experiences should be challenging, enriching and, not just an easy passage to the next level of knowledge. Different western musical instruments are taught through use of specific methods which have been proven to be viable over a long time. The *nyunga nyunga mbira* has its own methods that have been in use for a long time.

Through observing how the guitar, piano and violin are taught I will glean certain techniques which could be useful in the instruction of indigenous African musical instruments similar or closely related to the *nyunga nyunga mbira*. It is important from this point of view to discuss the background to this research in the next section in order to establish the framework and the course of the whole mini-dissertation.

1.2   Background to the study

This research is a pursuit of the most effective method(s) enabling the teaching of the *nyunga nyunga mbira* to music students who have never played the instrument before. Throughout my twenty two years as a music educator in Zimbabwe I noticed that indigenous music instruments are taught through one technique which is largely memorization. The *nyunga nyunga mbira* is taught in schools in Zimbabwe, using a formal method called the number notation. Nevertheless, there are no formal approaches to integrate the available modern technology in this method to facilitate the acquisition of skills to play the *mbira* instrument. In South Africa the *nyunga nyunga mbira* and the African *marimba* instruments have become part of the music education curriculum of some schools. It is important to note that although African *marimba* tunes can be transcribed using Sibelius notation software, the teaching of *marimba* is mostly done without the aid of technology assisted instruction. In general *nyunga nyunga mbira* music is, however, quite complex, with many polyrhythmic motifs. For this reason many music educators find it difficult to teach this music.

After transcribing *mbira* music into staff notation using the Sibelius notation software for personal use I discovered that I could use it to explore ways to teach the *nyunga nyunga mbira* instrument. Hence a proposed method that makes use of modern technology to enable learners to play the notated *nyunga nyunga mbira* music. The use of technology is something that can be exploited for the teaching and learning of the *nyunga nyunga mbira*. Furthermore the *nyunga nyunga mbira* keys are assigned to a three colour code relating to the fingering of the notated music. The research then takes an experimental approach where the staff notation method is compared with the indigenous method which ideally revolves around memorization of key combinations and the practical playing of the instrument. In pursuit of effective methods that help first-time learners to play the *nyunga nyunga mbira* I found it necessary to use Sibelius notation software, computers, and visual instruction on the computer and the overhead projector to investigate the problem.

This research takes the *nyunga nyunga mbira* instrument to music learners who have never played it before. Preliminary research with 20 students from Jyväskylä University in Finland in October 2009 showed that Sibelius notation software with visual and audio excerpts helped in teaching the *nyunga nyunga mbira*. After a week of tuition the aforementioned 20 students were able to play a *nyunga nyunga mbira* tune. If the same students were exposed to the *nyunga nyunga mbira* instrument for a longer time period, better results could have been realized in performing the *nyunga nyunga mbira* songs.

1.3 Statement of the problem

The teaching of African indigenous musical instruments has been gaining momentum in the education systems of some southern African countries, and some of these instruments include African drums, *marimba* and *mbira* which are mainly taught outside the school timetable or sometimes as a co-curricular component. In South Africa the government has put in place a national curriculum for Arts and Culture. Furthermore there is also the teacher's guide for the Arts and Culture curriculum in relation to assessment of the learning activities. Although concerted efforts have been made to include indigenous instruments in the curriculum they appear to be difficult to teach because there is a lack of teaching resources. To an extent memory is required in all learning whether practical instruments or theory of music. The teaching of indigenous musical instruments depends heavily on memorization and this creates a big challenge to first time learners. Learners who are exposed to learning with a lot of resources find it difficult when they are required to deal with African indigenous instruments. In the end some learners with western classical musical background and are accustomed to learning their music from notation lose out. With the availability of software packages to help transcribe *mbira* music one wonders why it is not possible to formalize the teaching of *mbira* and other indigenous musical instruments in the schools in South Africa. In spite of the availability of advanced technology South Africa is still lagging in the use of such technology to develop resources and teaching methods for African indigenous musical instruments. Davis (1989) in articulating the Technology Acceptance Model (TAM) says perceived usefulness and ease of use of information technology determines one's intent to use it. With the use of TAM theory there is therefore a need to facilitate and promote the use available modern technology to develop resources required to teach the African indigenous instruments as provided for in the national curriculum.

1.4 Hypothesis

The availability of notation software packages can be used to offer tuition to first time learners of African indigenous instruments and in particular the *nyunga nyunga mbira*. Hence a combination of modern technology software and staff notation can result in a better understanding of how to play the *nyunga nyunga mbira* instrument instead of only using the African indigenous method of instruction.

1.5 Research questions

The main research question on which this study is based is as follows:

How can modern music technology be used in developing an effective method for the teaching of the *nyunga nyunga mbira* to first time music learners?

The following sub-questions relate to the main question above:

- How are the indigenous musical instruments taught in the schools in South Africa?
- Why is there a slow uptake of indigenous instruments in spite of availability of the curriculum statement on Arts and Culture and on Music?
- What impact can modern technology have on the teaching of indigenous music in schools in South Africa?

1.6 Aim of the study

The primary reason for this research is to ascertain the effectiveness of music technology through using music notation software such as Sibelius in the teaching of the *nyunga nyunga mbira* indigenous instrument. The experimental research seeks to compare the effectiveness of the indigenous methods of learning with teaching through the use of modern technology, and then recommend effective approaches to learners and teachers. The research furthermore seeks to develop an appreciation of using modern technology resources in the teaching African indigenous *nyunga nyunga mbira* instrument.

1.7 Delimitations of the study

The research focused on a comparison between computer-assisted and indigenous methods, specifically in teaching the *nyunga nyunga mbira*. The learners included in this research were drawn from a constituency who had never played the *nyunga nyunga mbira* before. They were taught in two groups during the Arts and Culture school periods. The groups comprised pupils from different ethnic, social and cultural backgrounds, regardless of their interest in performing the *nyunga nyunga mbira*. The medium of instruction was English since all the material used and activities were prepared in that language. The research was conducted in South Africa at the Pretoria Chinese School (PCS). The study involved two grade six classes with 15 learners each. The size of the groups enabled easy management. With a limited number of instruments available, large numbers are difficult to use in conducting meaningful teaching of the learners.

1.8 Significance of the study

The outcomes of this study should be useful in the integration of the *nyunga nyunga mbira* African instrument as part of the Arts and Culture and Music teaching resources. The teaching resources and viable methods can be recommended for use in the teaching. During the research all 30 learners had the opportunity of gaining practical knowledge of playing the *nyunga nyunga mbira*. The *nyunga nyunga mbira* instruments that were used at PCS remain there and become the property of the school after the study. At the end of this research the acquired skills can be useful to inculcate the culture of the *nyunga nyunga mbira*. Teachers and students can set up ensembles for performing *nyunga nyunga mbira* instruments at the school. Findings from this research can be used for further research that might lead to more discoveries geared towards the uplifting of music in the education curriculum of South Africa. Results of this research can be used to teach *nyunga nyunga mbira* and other indigenous African instruments.

1.9 Assumptions

In this study I assumed that the students participating in the research at PCS had a basis of computer literacy. The learners had the capability of using their computer skills to acquire various forms of new knowledge. It was also assumed that it was possible for the students to learn to play the indigenous *nyunga nyunga mbira* through a computer assisted approach.

1.10 Limitations

The study involved learners who did not have previous knowledge of the instrument. Some of the pupils might just not like to play the instrument since it can cause the fingers to itch. Although the school had shown interest in allowing research at their institution, there was a dire need to source more *nyunga nyunga mbira* instruments to afford all the pupils ample time for practice, especially after the lessons. Although a discount had been provisionally granted for an order exceeding ten instruments, only five were procured as there was no money to purchase the required number. The research was conducted with only fifteen instruments available for use.

1.11 Definitions of terms

- Indigenous method - is the rote method used to teach *nyunga nyunga mbira*
- *Mbira* - refers to the *nyunga nyunga mbira* instrument
- Modern technology - refers to modern equipment such as computers, overhead projectors and speakers used for teaching the *nyunga nyunga mbira* in this research project
- Staff notation method - refers to the Sibelius software-based method of teaching the *nyunga nyunga mbira* in this research project.

1.12 Summary

This chapter constitutes an introduction to the research and provides a framework for the key issues. The discussion involved the background to the research and how the problem was defined. The research problem and the sub-questions thereof were stated and the aim, significance and assumptions of the study explained. The chapter also set out the parameters for the study, showing what was included and excluded in the research project. Definitions of terms particular to the research project are listed.

CHAPTER 2

MUSIC EDUCATION APPROACHES AND INSTRUMENT PLAYING TECHNIQUES

2.1   Introduction

The purpose of this literature review is to discuss general principles applied in the tuition of musical instruments. Deliberations in this chapter include the ideas of Kodály and Dalcroze in their theories of music education approaches. In this section the instruments guitar, violin and piano are highlighted because their fingering techniques can be useful in appreciating the *nyunga nyunga mbira* playing method*.*

It is also significant for the discussion to examine teaching approaches for the *nyunga nyunga mbira* since the study focuses on its teaching methods. The playing techniques for the three western instruments are subjected to a comparison with those of the *nyunga nyunga mbira*. An analysis of the strengths and weaknesses in methods can help to develop effective ways to teach the *nyunga nyunga mbira* instrument. The South African national Arts and Culture policy document is also discussed in the backdrop to the teaching of indigenous musical instruments in schools. The last part of the chapter focuses on modern technology notation software as a support to the teaching of musical instruments.

2.2   A review of the Kodály method

The basis of music education according to Kodály hinges on skilled teachers dedicating a lot of time in music tuition (http://en.wikipedia.org/wiki/Kod%C3%A1ly_Method#Pedagogy).The above statement means that well qualified music educators are required in order to give quality tuition to children. However, the issue of time allocation is a matter of policy and teachers cannot create more time than what legislation provides for in schools. In the current scenario in South Africa, music is taught by specialized teachers only in certain schools. Some of these schools have Arts and Culture as a learning area that focuses on art, dance, drama and music up to the end of grade 9, ahead of offering Music in the Further Education and Training (FET) phase, grades 10-12. It is then possible for qualified music teachers to lay a foundation for FET Music. According to Choksy et al (1991:10), the Kodály method is child-centred and takes care of

learning material relevant to the cognitive ability of the learners. The music teacher then has to take time to study the learners under his/her care and create comprehensive learning experiences. Choksy et al (2001:81) indicate that, "…Kodály Method came in the way in which previously separate techniques were combined into one unified approach, which itself supported a viable philosophy of music education." The above-mentioned view suggests the need for use of different techniques for the teaching of music. In current times it would be sensible to take advantage of modern technology so as to effectively teach different instruments. However, schools and their governing bodies then need to procure the modern technological requirements for the pupils to learn. Even though certain schools may have the will to use modern technology, some of the equipment may not be affordable for them.

Furthermore Choksy (2001:83) mentions that Kodály in his learning theory proposes that notation should begin with crotchets and quavers as these are applicable to the learners' daily walking and running experiences. The *mbira* tunes to be used in this research comprise rhythm that combines quarter and eighth notes as propounded by Kodály. The famous Chinese proverb "I hear and I forget; I see and I remember; I do and I understand" explains why it is important for the tunes to be at the level of the children's capacity: without involvement there would not be any conception. The tempo for the tunes is mainly slow to a moderate/ walking pace. *Mbira* tunes have complex rhythms that are problematic to introduce to first time young learners. Unless simplified the complex *mbira* rhythms should only be introduced gradually. Therefore the *mbira* tunes used in this study are simple and relevant to the age of the learners.

According to http://en.wikipedia.org/wiki/Kod%C3%A1ly_Method#Pedagogy, Kodály proposes the use of a movable *doh* in solfege as a foundation for the sight reading of staff notation. The application of solfege on the *nyunga nyunga mbira* works with F serving as the doh or tonal centre and a six note scale. In making learners understand the tuning of the *mbira* instrument's fifteen keys the solfege syllables are thus (F *doh*, G *re*, A *mi*, C *so*, D *la*, and E *ti*). Solfege syllables also help in developing an appreciation of the tonal relationships among the lamella on the *nyunga nyunga mbira* instrument keys. *Mbira* performers who cannot understand the solfege of the keys may not be able to tune an out-of-tune instrument. Tuning of the *mbira* instrument is critical and should be understood. The *nyunga nyunga mbira* has been preserved over many years with no advanced technology because the indigenous people understood the tuning system of the instrument, even if they may have not had some terminology for it. If solfege is used properly, it can set a good foundation to help learners find the notes to play on

the instrument. Without it the learning process would require a lot of time to enable learners to get to the point where they can be able to tune the instrument if needed. Through solfege some learners can notice that the *mbira* instrument needs tuning even if they may not yet be able to do so. However, it is possible to tune the instrument with precision using an electronic chromatic tuner, but the most important factor is a good, trained musical ear.

2.3   Dalcroze's theory of learning

Dalcroze is the exponent of eurhythmics - the use of physical movement and musical rhythms to reinforce the concepts which affect the student's performance and retention of musical basics (Bachmann1991:357-358). Practical involvement of learners in activities helps develop musical concepts. Accordingly success of eurhythmics depends on the teachers' ability to implement it in the real life situation. Teachers should motivate learners to participate in the learning experiences as envisaged in Dalcroze's theory (Choksy et al 2001:49). The choice of activities depends on the teacher's discretion and personal creativity. However, it should be noted that all the musical concepts in the music programme are governed by the education policy: hence, all the teachers' choices are expected to remain relevant to the set national curriculum goals.

Dalcroze's approach in music education sought to develop the fine and gross motor skills required to play musical instruments. Eurhythmics helps to develop rhythmic movement and a sense of space in children. Without placing a special emphasis on the theory of music it is vital to see how practical involvement is a key to the success of playing the *nyunga nyunga mbira* music. According to Choksy et al (2001:52), Dalcroze theory sought to develop the ability to internalize feelings of movements and sounds - thus inner hearing. It is true with *nyunga nyunga mbira* music learners that they can internalize melodies and the movement of fingers as they pluck the keys. As they do this with the aid of visuals, audio and acoustic instruments, the probability of understanding is high. It is therefore important to ensure that each child has an instrument to play so that the sessions enable personal practical involvement.

In South Africa there is a set curriculum for music education. This research does not, however, focus on it. Instead the focus is on the specific Arts and Culture policy document to see how it relates to the teaching of traditional African indigenous music. All the learners involved in this study were taking classes in the Arts and Culture learning area at the selected school. Hence it

is necessary to look at the core concepts of the curriculum so that a point of departure can be found for the teaching of the *nyunga nyunga mbira* with the use of modern technology.

2.4   Arts and Culture as a learning area in South African schools

Arts and Culture in the school curriculum in South Africa offers music, dance, art and drama as the core areas of study. Depending on what each of the concepts can mean, it is important to note that all of the core concepts converge in many ways. Music involves dance while dance on its own is a form of music making. Art is similar to music in that students are involved in creating and arranging colours and materials. Culture is a broad concept as it revolves around music, art, and dance. It is not possible to appreciate a culture without a focus on inherent musical practices. Even though the policy document stipulates the core areas to be covered, Arts and Culture is virtually inexhaustible. Vermeulen (2009) observes that Arts and Culture is too broad an area and it is quite difficult for educators to take a holistic teaching approach. Klopper (2004:9), cited by Vermeulen (2009), also insists that an integrated learning area does not give precedence to any one of the key components: as a result it can be problematic. Unless the Arts and Culture concepts and content are properly streamlined, the intended coverage would present a big workload for the usually un- and underqualified teachers of whom this is expected.

The policy document on Arts and Culture in South Africa gives the teacher considerable autonomy to plan and choose learning programmes for the learners, using set guidelines. The learners are, however, expected to compose and perform on a variety of traditional musical instruments and in dances. These learning experiences are relevant to each grade level of learning. In line with the National Curriculum Statement (2003a:85-87), grade 9 learners are expected to make music using voice and percussion instruments and in compound or irregular metres such as 5 crotchets per bar and compound time of 12 quavers per bar. Furthermore the National Curriculum Statement (2003a) stipulates that learners should develop appreciation of musical cultures from other countries. The geographical scope of cultures to be appreciated covers north, east, west and southern Africa. The grade 9 learners should be able to analyse a variety of music. However, the way the policy document has been crafted leaves a lot of independence for teachers to choose subject materials for the children. Even though it is good for the teachers to use their discretion to manipulate and experiment with methods, the content remains the same. Learners can suffer disadvantages if teachers do not employ effective methods and conducive, child-centred set ups. In the event of a teacher offering uninteresting

work there could be a risk of losing the attention of the learners and then very little learning takes place. It also becomes a problem if a national examination were to be written: the assessment criteria might create an uneven field for the learners.

Teachers who present Arts and Culture in schools are usually not specialists in all of the facets of the learning area. South African teachers who train to become teachers of music may get to schools where they can utilise their skills well. But the music educators who teach the learning area Arts and Culture might also have to cover drama, dance and visual arts. Vermeulen (2009) maintains that an integrated curriculum such as Arts and Culture can be useful. Furthermore she mentions that integration can result in potpourri and polarity problems. Whereas potpourri is the lack of a focus on particular subject matter, polarity is the extreme where teachers focus on their subject specialisation, leaving out others as not important. The implication of the above statement is to have well qualified music educators in order to give quality tuition to children.

At the Pretoria Chinese School music is offered as part of the Arts and Culture learning area. Even though it is a private school, the reason they offer this learning area is that it is a compulsory requirement for all schools up to grade 9. At PCS, after grade 9, and like other schools, learners can choose optional subjects other than music.

2.5   Teaching of the guitar

The guitar is relevant to this research since there are some important principles relating to its playing techniques that are similar to those of the *nyunga nyunga mbira.* It is the basic technique for the guitar that plays a very important role, regardless of whether one intends to play classical, jazz, rock or reggae styles among others. The central aspect is the way chords are formed on the finger board. According to Herfurth and Urwin (1970:vii) the fingers of the right and left hands have specific roles in the playing of a guitar. The fingers are designated with the numbers as shown in figure 1. The numbering of the fingers is for convenience since the guitar has six strings and humans can only use at most four fingers for chords on the finger board while the other hand is used for strumming or picking.

The left hand fingers are marked from the index as 1, 2, 3 and 4 with each one of them serving a specific role on the strings of the guitar. Herfurth and Urwin (1971:21) also emphasize the importance of a good posture and handling of the guitar. Furthermore they suggest that the

learner should be exposed to practicing of the fundamentals at least daily. Though consistent practice on the guitar is significant, learners need to be exposed to the ideal ways to play the instrument. Insisting on the correct posture and position of the wrist and fingers over the instrument is imperative. Byzantine (2002:5) encourages both the instructor and the learner to choose a comfortable posture. A good posture, whether standing or seated, should enable the performance of the guitar to be executed with ease. The filing of fingernails to remove hooks helps the playing to be done smoothly and with ease (Byzantine 2002:13). Glise (1977:67) emphasises that finger exercise should be done consistently before the practice session. Practice is good as it prepares the learner for the practical work on the instrument. The exercise includes placing fingers on a flat surface like the finger board and lifting them one after the other, both in sequence and at random. Although the exercise he suggests does not involve the thumb, it prepares one for the guitar reflexes. Urshalmi (2006:54) says a loose fist for the right hand helps to remove tension from the hand and maintain a good posture. The vital point is to make sure the guitarist has total control of the instrument and avoids loss of control of the reflexes while playing.

Figure 2.1   The left hand fingering for guitar
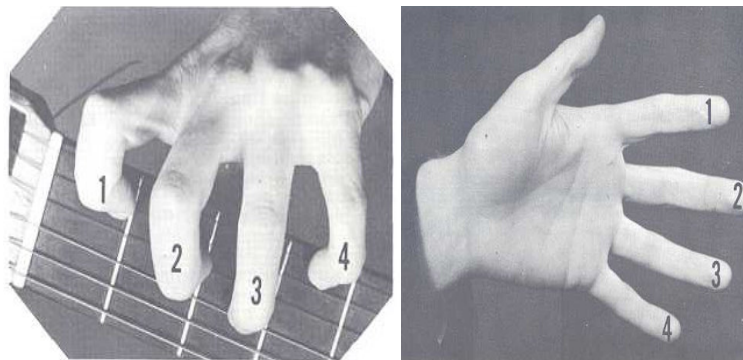
Fernandez (2001:8) observes that actions required to play the guitar are highly complex, requiring advanced co-ordination of the neuromuscular system. Guitarists use both hands, they listen to the music to keep in time, read the tablature or notation if need be and they also sing if called upon to do that. The tutor and the learner should engage in a process to develop the fine and gross motor skills. It is of paramount importance that good habits are nurtured from the beginning to avoid the frustrations associated with guitar performance such as failure to co-

ordinate the fingers, itching of fingers and playing with a constant tempo. Before making some generalisations on fingering, the piano will be discussed in the next section.

2.6   Piano teaching

Last (1980:12) emphasises that it is fundamental for piano players to be relaxed. The amount of tension in the body affects its placement and subsequently the fingering on the piano keyboard. Pianists need to begin with exercises that help removal of tension. A number of pianists take a position that inhibits them from free access to the entire keyboard - something that should not be the case (Last 1980:16). Sitting too close or too far can also result in tension which might create frustration on the part of the aspiring pianist.

The first step towards playing the piano is to enable oneself to relax, and to make sure that the arms are stretched to shoulder height and then dropped as if one is dead (Gieseking and Leimer 1970:10-11). It is also important to notice that Gieseking and Leimer (1970:10-11) base their teaching method upon ear training: they find it vital to practise visualising the music in order to develop the ability to play it from memory. Their approach relates well to the traditional African methods where the ultimate goal is for the performer to play as many tunes as there are from memory. I agree that visualising the music helps to train the ear to listen to oneself as playing proceeds. The only difference perhaps is that some of the traditional African tunes that are not notated require that the learner carefully observe the instructor in order to develop visualising the music. However, with software packages it is now possible to notate traditional African music, including *nyunga nyunga mbira* tunes.

The right hand fingers are numbered as 1, 2, 3, 4 and 5 and the left hand from the thumb 5, 4, 3, 2 and 1. Pace (1971:2-3) shows the ascending and descending order of both the right and left hand fingers as shown in figure 2.1. The significance of the numbering for the fingers is that it gives the pianist the necessary cues to follow, especially in the early stages of first piano lessons. Once the basic skills have been acquired the numbering of fingers and playing positions are placed into memory and there should be no need to always indicate numbers on the score or the instrument. With the exception of music for elementary piano training, piano music does not contain numbers indicating fingering.

Figure 2.2   Placement of the left hand on the piano keyboard

Through experience and practice pianists know how to depress the piano keys and play through sight reading. In a similar way to the piano the *nyunga nyunga mbira* has a keyboard whose keys are numbered. Through practice and experience some performers can play with their eyes closed and still maintain a high degree of precision. Philipp (1982:2-3) advises that aspiring pianists should arch their hands as if they are holding an apple or pear. According to Philipp (1982:3) "The student can play on the cushions or tips of their fingers. Both ways are correct." He discourages collapsed fingers as detrimental because that removes firmness required all the time. Instead students should do exercises to develop the correct finger techniques to maintain positions. Some of the exercises include playing scales ascending and descending with correct shaping of fingers. As suggested by Philipp (1982), arching of fingers helps the performer to hold either white or black keys with ease. Straightening the fingers, on the other hand, inhibits the aspiring pianist from achieving the best results. Kotchevitsky (1982:41) recommends that fingers should not form a straight line with the keys in order to allow smooth movement of fingers up or down the keyboard. In this regard the exercises on scales should be done with the above-mentioned placement of fingers. Developing the desired habits is good in any instrumental playing since it helps the performer to achieve the best possible results. Bastien (1977:163) encourages the piano tutor to teach the five-finger positions. He goes on to say that they are helpful in shaping the fingers and developing a good position. Additionally exercises should be done consistently to develop the required skill. Kotchevitsky (1982:40) points out that fingers should be adjusted according to the length and the keys to be played, whether black or white.

From the way the piano is played one can glean that assigning numbers to the fingers and giving them specific roles is a fundamental technique to performing the instrument. However,

the method works with sight reading skills to enable piano tuition. Hence it is important to make sure that piano enthusiasts develop the ability to read music as they endeavour to play the instrument. Although important, it can be challenging to learn the two concepts at once. If the method can work with the piano, a keyboard instrument, then it is worth experimenting with the same method with the *nyunga nyunga mbira*.

2.7   Teaching the violin

Auer (1980:10) points out that those habits formed in the early period of training directly influence the later development of the student. All the aspects of violin playing, from the simple matter of holding the instrument, pave the way for good or bad performing habits. It is quite logical for violin pupils and the tutor to be resolute in developing acceptable techniques. The development of good and bad habits is a process and hence time should be spent in shaping the desired violin playing techniques.

It is important that the thumb should not extend beyond the fingerboard of the violin, to allow ease of playing the G string. Auer (1980:11) recommends the performer to place the left hand correctly in the first position. Masin and Kelemen (1982:21-50) outline the ideal handling of the violin and exercises to develop the motor skills thereof. Even though both hands play a fundamental role in performance of the violin, the left hand is more critical in playing of the strings. The importance of entire body mechanisms is essential to effective playing of the violin. According to Yampolsky (1967: 21-22), playing the violin demands a high degree of independence of the fingers of the left hand and precision in co-coordinating with the right hand. The different functions of the left and right hands can be a problem as the two have opposing functions. In order to develop an effective violin technique Masin and Kelemen (1982:51) suggest some consistent daily exercises to develop the violin player's dexterity, confidence, position changing and the pendulous movement of elbow to enable fingers to cross from string to string. The placement of the violin on the shoulder and the left and right hand positions should be ideal to enable comfort while performing.

Masin and Kelemen (1982:56) recommend that the palm of the hand must be turned inwards, facing the violin at such an angle as will enable the fingers to curl easily above the strings when playing in the first position; the palm should be nearly parallel to the neck of the violin on the G string, turning slightly more towards the edge of the instrument as the hand moves across to the

higher strings. Yampolsky (1967:26) suggests that practising the scales of G and D major in the first position helps violinists to play in the natural placement of fingers rather than the scale of C major.

Stowell (1985:78-80) suggests that the fingers must be kept over the strings, always ready to play promptly, as may be required in the music. Furthermore the performer should let fingers fall from a sufficient height for them to have impetus on the strings. Similar to keyboard technique, unnecessary finger activities should be avoided. As a general rule the fingers should not be raised from the strings without a good cause. The same is true with the *nyunga nyunga mbira*: all fingers are placed in a way that will enable plucking of keys without impediment of other idle fingers.

Masin and Kelemen (1982:61) hold that adherence to the guiding principles in playing the violin helps out in many ways whereas noncompliance with the suggested essential steps can lead to a futile endeavour. Performance on the violin should be spontaneous, especially if the performer grasps all the fundamental principles. Mechanical performance is often lifeless and can lead to memory lapses if a section of the music brings confusion to the performer. Bowing should be perfected to a point where the listener cannot tell when change of direction takes place. Masin and Kelemen (1982:61) advise, "Do not proceed to the next study until you have understood and solved all the basic problems." This is a measure to ensure that the best comes out of the practice sessions that instrumentalists undertake.

2.8   Similarities between techniques of western instruments and *nyunga nyunga mbira*

The various methods for the guitar, piano and violin relate well to the *nyunga nyunga mbira* in different ways. For the guitar, piano and violin the fingers are designated with specific numbers whose placement positions are also precisely defined. In *mbira* performance the placement of fingers can be illustrated on the scores and the instrument as well.

The guitar has six strings and there are four fingers to do chord work - thus assigning of numbers to the fingers enables the use of the strings to play various chords. For the *nyunga nyunga mbira* it is amazing that three fingers are involved in playing 15 keys. A *mbira* player can play a maximum of three keys for the chords at the same time. *Mbira* keys can also be played

one after the other in succession, especially in melodic motifs. Assigning numbers makes it more logical for the learner to see what to play and which finger to use. In writing the notation for *mbira* instruments it is important to notice that the music can only accommodate a maximum of three fingers and three keys at the same time. Whereas with the guitar all the strings can be played using the four fingers, for the mbira it is not possible. Even though there are other *mbira* instruments with 22 to 29 keys, the *nyunga nyunga mbira* should not scare aspiring players because a maximum of three fingers are used at simultaneously. Although the guitar performers have to polish their fingers nails to remove hooks, in *mbira* the nails have to be strong and longer to sustain the hard plucking of the mild steel keys.

The piano in particular is somewhat similar to the *mbira* which is often referred to as the thumb piano in the western world. Referring to the *mbira* as thumb piano tends to change the identity of an instrument which has its own specific name. It can only be appreciated if the term is used to draw similarities with keyboard instruments in western music. If performers can read music then it is possible for them to play the instrument with a music score in front of them. Example 1 is the basic score for the tune Kukayiwa, played using the left and right thumbs. Besides showing the fingering of the instrument the score also shows the performer the order of the fingers so as to avoid confusion. In Kukayiwa the basic tune requires the use of both the left and right thumbs played together as chords while the separation indicates that the right thumb plucks first then the left. If the score is in quavers the first bar will have six quavers followed by six quavers in the second bar and then the phrase ends. The scores for the *nyunga nyunga mbira* music are short and repetitive; hence they are easy to master.

Example 2.1   The Kukayiwa *nyunga nyunga mbira* tune

Kukayiwa 2
split chords

Transcribed by Muranda R.

Maraire A. D.

Andante

The red numbers are played with left thumb
the black ones are played with the right thumb

Nyunga nyunga mbira music is built around the concept of call and response with two sections. Most of the transcribed *mbira* scores have two sections: the question being the first section and the answer being the second. The rhythms for each score become complex as the performer develops skills in playing the instrument. Kukayiwa has complex rhythms and especially the high notes are diverse and inexhaustible.

The violin technique insists on placement of the fingers above the strings and maintaining a good position for the playing techniques. In much the same way the *nyunga nyunga mbira* requires that fingers be placed above the keys. The index finger takes the top half of the upper manual of the *nyunga nyunga mbira*. The left thumb plays the left half of the instrument; both the top and bottom manuals. The right thumb is designated to pluck the bottom keys from the lowest key F to the far right bottom end. As with the violin, unnecessary idle finger activity is strongly discouraged. The *nyunga nyunga mbira* player is supposed to hold the instrument in position with the same hands that also play the instrument. In this regard both instruments involve a lot neuromuscular activity.

One thing that may be uncommon with all three western instruments is that the *mbira* learner is encouraged to keep strong long finger nails. Strong finger nails help with the plucking of the mild steel keys. Initially the instruments can cause fingers to itch, and especially if one has short finger nails.

It is not possible to explore all the details about the guitar, piano and violin techniques as the study is not focusing on these instruments. However, the information discussed thus far helps to establish the importance of placement of fingers and the use of specific positions to play the instrument. As mentioned earlier, performance of these instruments requires a lot of discipline which can be developed through consistent exercises. It is important to establish that elementary performers need guidance from experienced instructors. All the techniques bear some similarities compared to the *nyunga nyunga mbira*. Whereas the performance of the above referred instruments requires discipline in fingering, so does the *nyunga nyunga mbira*. A haphazard approach can cause frustration and failure to achieve the desired level of proficiency. Hence learners need proper guidance and the instructor insisting on discipline on the correct positions of fingers. As has been emphasized in connection with guitar and piano performance, the need for discipline is eminent.

Guitar, piano and violin playing can be done with the performer reading a score and that presents a challenge as one also needs to read ahead of the music and play accordingly. The ability to read music becomes a critical aspect of the whole exercise as it has to be done promptly. The indigenous approach to *nyunga nyunga mbira* is usually done without a written score. The rote method becomes a problem when dealing with performers who are trained to read music and then find it strange to play without the music.

2.9   The Maraire number notation

Matiure (2008:16) discusses three traditional approaches that can be used in the teaching of *nyunga nyunga mbira* which are the rote, the apprentice and the inheritance methods. He then goes further to discuss the underlying approaches in each of the traditional methods. In this research the traditional method is conceived as a method combining the rote and apprentice. The inheritance is not part of the research as the learners involved do not have any connection with *mbira* and hence inheritance issues would not work. Even though the traditional indigenous method has two facets, the research focused on the method as whole and not the underlying methods. Therefore the generic indigenous traditional approach that combines the apprentice and memorisation aspects was used to teach the control group. Although Matiure (2008:16) argues that the number notation is a formal method it still falls under the traditional methods since it is deficient in giving the learners cues to pitch, rhythm and notation of music.

In the next section the discussion looks at the proponents of formal teaching of *mbira* in the education system. One of the proponents of *mbira* teaching was Abraham Maraire whose ideas revolutionised the teaching of *nyunga nyunga mbira.* He had his formal training as a teacher of music at Kwanongoma College of Music and subsequently went to the United States of America. While in the USA, Maraire introduced the *nyunga nyunga mbira* with the use of the number notation - a system that is still in use today. Currently the instrument is played at several universities in Zimbabwe as result of Maraire's innovation of the use of the number notation.

It is important to first explore the *nyunga nyunga mbira* in terms of the structure and arrangement of keys on the sound board. The layout of the lamella on the instrument is shown in Figure.2.3a with two layers of the upper and lower manuals. The keys are named in numbers rather than the pitch letters of the lamella.

Figure 2.3a   Layout of the *nyunga nyunga mbira* keyboard

Upper Manual ⟶

E	D	C	F'	C	D	E
2	4	6	8	10	12	14

Lower Manual ⟶

A	G	F	A,	F,	C,	D,	E,
1	3	5	7	9	11	13	15
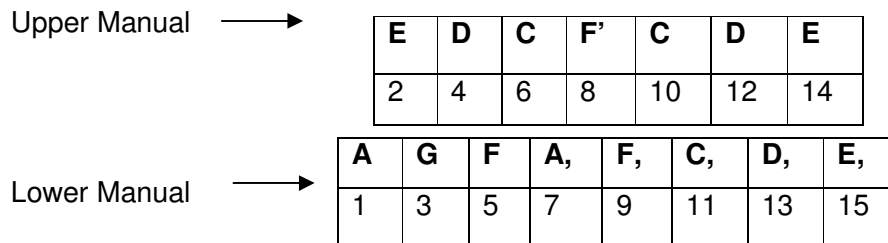
Figure 2.3b   The nyunga *nyunga mbira* keyboard

Bridge

The rod to secure the keys

Upper layer 2, 4, 6, 8, 10, 12. 14

Lower layer 1, 3,5,7,9,11,13,15

Sound board
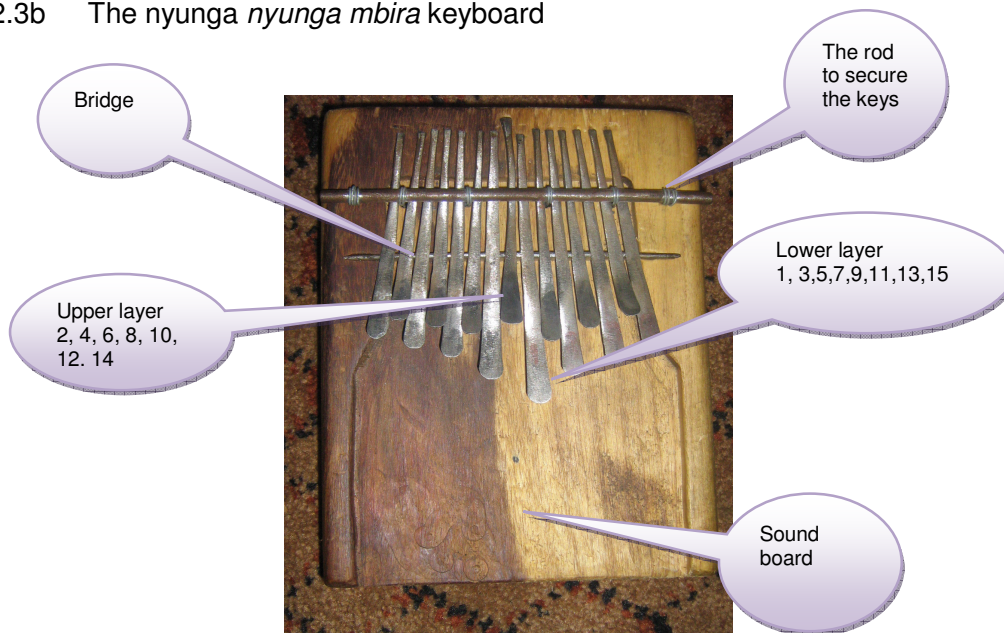
Dumisani Maraire was the earliest proponent of the number notation which is a simplified indigenous way to teach the *nyunga nyunga mbira,* especially to first time learners. The idea of the number notation is centred on numbering the lamella on the instrument's lower and upper manuals. Whereas the lower manual is made up of odd numbered keys1 -15 the upper comprises even numbers 2-14. According to www.wikipedia.com, "Dumi is credited for his famous 1-15 number notation used on the *nyunga nyunga mbira* and for notating the tune "Chemutengure" on the *nyunga nyunga mbira*. The tune "Chemutengure" is used to teach mbira learners the technique of playing the instrument." The number notation was necessitated by the quest for usable methods that would enable effective teaching and learning of the *nyunga nyunga mbira*.

The number notation method depends largely on memorization of the numbers, the structure and the arrangement of the keys on the instrument. Maraire should be credited for innovation of the number notation. However, the number notation does not give a cue to pitch and rhythm and hence it presents problems if one intends to play *nyunga nyunga mbira* music that is in staff notation. The number notation works more like a tablature. In this study my focus is on the effectiveness of the method and not the question of tablature and/or number notation as a format. It is vital to note that even if Maraire developed the number system, in this discussion the method is still an indigenous one as its basis is to play according to the rote method.

Figure 2.4   The number notation grid for the Kukayiwa basic chords

R	11	15	13	13	11	15	11	11
F								
L	5	1	1	1	5	1	3	3

R= right thumb, F= right fore finger and L= left thumb

2.10   The number notation with rhythm

Although the number notation has proven to be effective in teaching the *nyunga nyunga mbira* it denies the learners an opportunity to read pitch and rhythm of the numbers to be played. Considering the above-mentioned shortcomings of the number notation Tendekai Kuture, a music educator and lecturer in music at Africa University in Zimbabwe, proposes the inclusion of rhythm on the number notation to help in the articulation of the keys on the instrument. The numbers are played to the duration of the inserted rhythmic notes.

In the process of trying to solve the problems that come with the number notation, one problem remains unresolved and that is the issue of pitch. The inserted rhythm does not include the pitch to the number to be played and hence those with an ear for pitch may not make sense of this notation unless someone explains specifically.

Although Kuture's innovations are positive it is significant to keep on experimenting with methods until an ultimate solution is found. Sheasby Matiure, Tendai Muparutsa and Perminus

Matiure are some of the scholars who are currently involved in research to refine the teaching of the *nyunga nyunga mbira* and it will be interesting to see what they will find. Another improvement to the number notation is put forward by Matiure (2008), a prolific *mbira* maker, performer and ethnomusicologist at Midlands State University. The ensuing paragraphs present a discussion on Matiure's contributions to the teaching and learning of the *nyunga nyunga mbira*

Figure 2.5   The number notation with rhythm

R	11	15	13	13	11	15	11	11
F								
L	5	1	1	1	5	1	3	3
Rhythm	♪	♪	♪	♪	♪	♪	♪	♪

2.11   The Matiure letter notation

The chief exponent of the letter notation is Matiure (2008).In his research on the *nhare nyunga mbira* hybrid he proposes the use of the letter notation for *nyunga nyunga mbira* tunes. According to Matiure (2008) the use of the music letters instead of number notation enables a better teaching and learning approach to the *nyunga nyunga mbira*. Matiure (2008:15) developed this approach because of "...the lack of proper teaching materials in terms of literature and methodology." I concur with his opinion and hence this research also focuses on the quest for methods that can help teachers and learners in playing the *nyunga nyunga mbira*.

Matiure (2009:3) goes further to mention that replacing the numbers with letter notation goes a long way to help aspiring *mbira* players to conceive the *mbira* tunes in terms of their pitch. This notion is good, especially when dealing with *mbira* players who have a sense of perfect pitch, as the lamella have specific pitches. The picture of the *nyunga nyunga mbira* below shows how the letters are spread on the lower and upper layers of the keyboard. Instead of using the numbers, the pitch letters are used for the different keys on the instrument. The lettering is a way to assign some cues to the pitch of the keys.

Figure 2.6   The picture of the real *mbira* with lettering
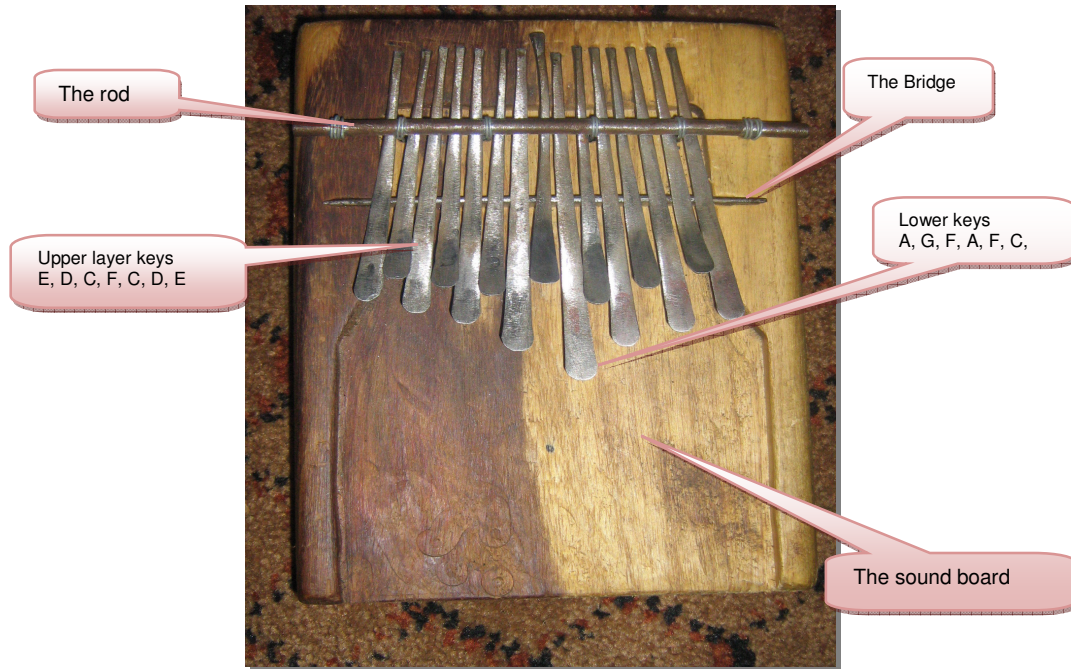
Figure 2.7   The *nyunga nyunga mbira* letter notation grid

R	C,	E,	D,	D,	C,	E	C,	C,
F								
L	F	A	A	F	F	A	G	G

Figure 2.8   The layout of the *nyunga nyunga mbira* keyboard

Upper Manual ⟶

E	D	C	F'	C	D	E
2	4	6	8	10	12	14

Lower manual ⟶

A	G	F	A,	F,	C,	D,	E,
1	3	5	7	9	11	13	15

In his approach Matiure (2009:16) advocates that teaching of the instruments should begin with basic patterns. Figure 2.7 shows a basic pattern for the Kukayiwa tune. Matiure also uses the pulse notation to illustrate the transcription of the *mbira* tunes to be learnt. The obvious weakness to this approach is that it does not give an indication of the duration of the pitches.

Matiure (2009:16) proposes the use of pulse notation as a way to give cues to both pitch and duration of the letter notation.

The pulse notation method is the innovation of Tracey (1972). It appears not very easy to use, especially with first time learners; hence considerable experience with pulse notation is necessary before the learning of the *mbira* takes place. For this discussion it will not be covered since there is also the use of the conventional staff notation for *nyunga nyunga mbira.* More needs to be done with pulse notation to create proper understanding among the intended users. Through the use of Sibelius notation software I found that one can successfully teach *mbira* to first time learners. Therefore the next segment focuses on computer assisted instruction

2.12   Modern technology and the *nyunga nyunga mbira* instrument

There is a gap between modern technology and the tuition of indigenous musical instruments. Muranda observes that (2010:80) "Using technology at traditional ceremonies is not usually allowed." There are specific places where modern technology cannot be mixed with indigenous functions; for example rain making ceremonies among the Shona people. While it may be true with traditional ceremonies that there are no hard and fast rules as regards the use of modern technology in the teaching of the *nyunga nyunga mbira*, there are certain people who view the use of modern technology in teaching indigenous music as indicating prejudice against indigenous knowledge systems. A balanced view of the place of modern technology needs to be found because evolution will never stop taking place and all knowledge systems have to be relevant in order to survive.

Modern technology can be good if it seeks to complement the indigenous African knowledge systems. Society is likely to shun forms of modern technology that threaten the existence of essential knowledge systems. The imminent changes taking place today cause people to make adjustments in order to survive. The shift towards an increased uptake of modern technology has become inevitable in the schools and society in general. A deliberate move towards use of modern technology will only help society to cope with the forthcoming evolution in the world of music. Hodges (2001:171) propounds that "... technology should not restrict the exploration of particular environments ... in performance related-activities it is possible to specify learning outcomes in advance of the performance." There is a strong link between modern technology and music. The coming of digital technology in recent years has helped to preserve traditional

indigenous music with precision. Public performance of the indigenous instruments, and particularly the *nyunga nyunga mbira,* has been enhanced through the use of advanced pick up microphones (Muranda 2010). According to Huber and Runstein (2005) the shift towards modern technology has taken a central role in the music industry globally in the 21st century. For this reason the choice to move with the modern trends in the area of indigenous music can only help to develop *nyunga nyunga mbira* and many other instruments.

Modern technology is designed to assist human endeavours and tackle tasks with ease. Teaching and learning processes can benefit immensely if modern technology is well utilised in the classroom. The use of remote controls for the operation of televisions, radios, gates and many other household goods revolutionised homes. Computers have helped human beings in multi-tasking. Choksy et al (2001:24) submit that, "Computers, once the province of the rich and an informed elite, have become increasingly widespread tools in businesses, schools and homes." The use of computers increased because of their capacity to store, process and access information with ease. It used to take a long time to record, edit, mix and master a music album; however, owing to modern recording technology, the time taken for a similar project to preserve music has greatly been reduced (Huber and Runstein 2005). With the use of Sibelius/Finale or other forms of notation software packages one can transcribe *nyunga nyunga mbira* music and play it back with precision. Although notating *mbira* music can be challenging, especially the more complex melodies, it is still possible with notation software packages to undertake such tasks. It is therefore important to strike a balance between indigenous *mbira* music and the use of any kind of modern notation software package.

The computer aided approach to the teaching of African music instruments is something that can be explored especially with Sibelius, Finale and other useful notation software packages. Hodges (2001:171) suggests that, "Information Communication technology (ICT) embraces all developing and enabling technologies relevant to the curriculum. ICT includes all forms of computer-based learning." The above citation points to the necessity of good use of technologies to facilitate relevant learning experiences. An ideal method makes use of the notated tunes to demonstrate the fingering of the lamella. The proposed technology assisted method makes use of notated *nyunga nyunga mbira* tunes to play while reading the score. Mash (1991) cited by Rudolph (1996:6) says, "... technology has created new opportunities in the field of music and [that] we, as music educators, must prepare students to interact with and utilize these tools." The advantages to this approach are that it allows the learners to
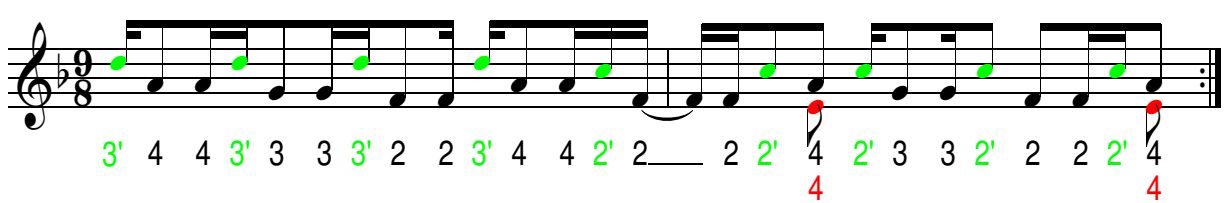
manipulate, read music, hear the audio and see the rise and fall of pitch notes as the music flows from the beginning to the end. The learners can also appreciate the tempo and nature of the rhythm of the tune. Most notation software packages like Sibelius and Finale allow for the inclusion of the fingering on the notation, thus showing the key numbers to be played and the finger or thumb to be used.

A worthwhile approach in the use of technology can provide learners with an opportunity to develop creative skills on their own. In his discourse on the use of ICT in the curriculum Desmond (2002:159) asserts that, "The use of technology can help overcome the traditional restrictions between innate, creative musicality and acquired performing skills ... can enable students to develop at their own pace without the need for constant teacher intervention." The *nyunga nyunga mbira* can be learnt in a way that is similar to the techniques of playing the guitar, piano and violin in terms of fingering patterns. With the use of modern technology the music for the *nyunga nyunga mbira* can be made available to many who could otherwise find it difficult to master.

The notation approaches proposed by Maraire (1991), Matiure (2010) and Kuture (2002) only offer guidance to the fingering of tunes on the *nyunga nyunga mbira* without a precise indication as to pitch and rhythm.

Example 2.2   *Bungautete mbira* tune with the three colour codes

The advantage of the use of modern technology is that learners can practise and work on their own using guidelines and the tutorials to explore more complex applications. Sibelius software is a flexible and user-friendly package to notate different kinds of music. With Sibelius one can

use colour codes to show the fingering for the *nyunga nyunga mbira*. Instead of indicating fingering through numbers only, the use of colours indicates a cue to fingering that should be used. The method is based on the colour code with black notes specifically for the left thumb; green for the right index finger and red for the right thumb (see the score example 2.2). The advantage of the method is that it works well with learners who have a western classical music background. It can also be used with learners who can read music on the five lines and four spaces of the treble staff.

Example 2.3 is a simpler version of Bungautete notated with use of two colours. The tune illustrates the use of two thumbs. It is, however, important to note that indicating fingering through numbers and the colour code can be used at the same time. Students would choose whatever comes easier to them to use. The concurrent indication of colour code and numbering is normally useful to learners who are taking up sight reading and the *nyunga nyunga mbira* instrument at the same time. The combination of numbering and the colour code presents the learner with the visual aspect of the *nyunga nyunga mbira* music. With the score in example 2.2 the learners can learn to play the instrument, following the colours and the numbers as well. The score only entails use of the left and right thumbs since there are red and black notes only. The reason is to start from a simple point and then advance to more complex tunes. Until they grasp the basic tunes, complex tunes should be delayed to avoid frustration in the event of severe difficulties.

Example 2.3   *Bungautete* with the colour codes for left and right thumbs

Bungautete

Arranged by Muranda R   Anoynmous Shona folk song

R is for the right thumb   Copyright © 2010   L is for the left thumb

The only challenge with the above proposed method is that first time learners need to be taught sight reading of staff notation before learning the instrument or sometimes this is done at the same time. Learners are different and they grasp concepts at different paces hence learning to

sight-read first is advisable to avoid too much workload within a limited time. Since there are guitar/piano/violin books that teach sight-reading to beginner students while they learn the art of playing there may be need for the development of learning materials that can teach reading of music using the *mbira.* The learners can play the instrument at the same time learn sight reading and theory as they proceed to learn advanced tunes. The other drawback to the method is that it tends to make the playing of the instrument mechanical - a trait that is not African. In spite of the *nyunga nyunga mbira* instrument being an indigenous African instrument it can, of course, be played by anyone. It is essential, therefore, that once an individual masters the skills to play it, the instrument can be played to suit different musical cultures. The use of modern technology should be conceived as a catalyst to help develop the skills to play any music instruments. If the *nyunga nyunga mbira* is exported to another culture the people in that society would play it in the way that is relevant to their context. The modern technology assisted approach is useful to people with an interest in using modern gadgets. Having or not having interest may not be enough, and therefore music theory helps as the approach is based on the five lines and four spaces of the musical alphabet.

A certain level of knowledge of the theory of music is required in order to understand and operate most of the software packages. It is important to understand that most packages offer tutorials on how to operate the software and may explain certain key features thereof. For example a software package will give explanations for things like anacrusis, compound metre, staccato and accents and even go further to demonstrate how to input them in a score. In order to keep pace with modern trends the learners should be exposed to working with instruction through modern technology where a score is played on the computer and learners can touch, hear, see and feel the mood of the music. A variety of activities can help the learners to remain focused and motivated to learn, hence achieving the set objectives to play first basic and then advanced and complex *mbira* tunes at different levels. In conducting this research the focus is on finding an effective way of teaching *nyunga nyunga mbira* using computer assisted instruction.

2.13   Summary

In this chapter I discussed the specific fingering methods applied to the teaching of the guitar, piano, violin and the *nyunga nyunga mbira*. It was established that all four instruments are played with use of certain rules as to the movement of hands and fingers. From the similarities

of the techniques it is possible to establish similar rules for fingering on the *nyunga nyunga mbira*. The placement of hands and a good posture were seen to be critical issues, and if undermined could result in failure to play the instrument properly. A brief review of the theories of music education according to Kodály and Dalcroze were discussed in this chapter. It was also vital to see how the theories linked with this research. The South African national Arts and Culture policy document was discussed in as far as the teaching of music in schools is concerned. The discussion on modern technology established the current trends both locally and globally. The next chapter now focuses on the research methodology and data collection.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1   Introduction

This chapter is focused on presenting the strategies used for the research design, methodology, sampling, data collection and analysis. The research was conducted according to an experimental design which included some action research that had a number of different instruments employed to collect data. It is important in this section to outline the strengths and possible weaknesses of each of the aspects of this research design. Hence the discussion will also look at the issues of reliability and validity of the whole approach to data collection and analysis. The discourse closes with a summary of the discussion in the chapter.

3.2   Research design

Whereas the research design is mainly focused on planning the research and the nature of the study, methods involve detailing how the study was conducted, through the use of specific instruments and techniques. According to Robson (1998) a research design is concerned with turning the research questions into projects as a means to address the core issues of the research. Research design entails the use of specific methods of investigation into the crux of the problem(s) or phenomenon/phenomena. Leedy and Ormrod (1985:91) describe a research design as the overall plan of how the research should be done. Furthermore Leedy and Ormrod (1985:91) hold that, "The design is the complete strategy of attack on the central research problem. It provides the overall structure for the procedures that the research follows, the data the researcher collects and the data analyses that the researcher conducts." Hofstee (2009:113) and Mouton (2009:49) concur that research design is the overall strategy and plan of action used to solicit answers to a research problem. From the above information it is clear that the research design is the researcher's deliberate plan which enables the research objective(s) to be realised. The design gives a framework for the research. After choosing an ideal research design it is appropriate to work on the methodology.

The choice or type of research design depends on the nature of the problem and the preferred style of research and sometimes the area of study too. Most hard science subjects involve experimental research while social scientists or researchers in the arts usually engage in ethnographic studies (Leedy and Ormrod 1985). There are no hard and fast rules about choices of research design as long as they help to focus the research work. According to Mouton (2009:56) a research design focuses on the final product with the research question being the point of departure. In the light of the nature of the problem statement and the area of study, the design for this mini-dissertation was a construct of different designs. In this study a combination of research designs was selected although the main one was experimental. The comparison of two methods of the teaching of *nyunga nyunga mbira* dictated the use of an experimental design whose underlying sub-questions required some action research and hence participant observations.

Mouton (2009) mentions that there are two broad research paradigms that are concerned with qualitative and quantitative approaches. Qualitative research mainly deals with interacting with people in order to find knowledge. Quantitative research is mainly focused on finding the results of the investigation without necessarily dealing with people. In this design a combination of these two paradigms was used. The next paragraph reviews the strengths and probable weaknesses of the chosen research design.

3.2.1   Merits and demerits of the experimental research design

Leedy and Ormrod (1985:93) emphasize that investigating a problem needs to be done via realistic and practicable means; hence the design should justify the research results. If the design cannot lead to the desired end, then the purpose of the research is defeated. The experimental design has some advantages to offer to the researcher. The design allows the study to take place under controlled conditions, thereby eliminating variables that could otherwise skew the study. The reduction of possible internal variables can assist the researcher to concentrate on achieving the research objectives. The condition with which the experimental research is conducted can keep the subjects and the researcher focused on the objectives and results of the experiment. The researcher should not force subjects into the research they should be respected, protected and if there are gains all should benefit (http://www.researchconnections.org/childcare/datamethods/experimentsquasi.js). Some ethical considerations have to be borne in mind to give surety that there is no violation of the rights of the subjects. Ethical requirements for the study were adhered to and permission to set up the experimental research within the context of the subjects was granted.

Some experimental research designs do not need isolated laboratories because they can be conducted within the natural setting of the subjects, to ensure validity. Chilisa and Preece (2005:96) prefer to call this kind of design quasi-experimental because it capitalises on the natural environment of the subjects to conduct the research. The advantage of this design is that it reduces chances of suspicion from the subjects. The subjects are likely to adapt to the research because their consent is respected by the researcher. However, complete control can be difficult in quasi-experimental research as the conditions are more relaxed than in the laboratory experimental research design. Hence it does not put the subjects under pressure to perform better than what they can possibly do.

Experimental research does not involve large groups of the population and hence management is easier, with smaller groups. Findings from small population samples may not necessarily, however, allow application of results to a bigger section of the society. A small sample needs more time to experiment with the subjects to ensure validity and reliability of findings. Experimental research may also need triangulation to ensure validity of data collection. A problem thus associated with experimental research is that subjects can be motivated to do better simply because they are participating in the research, thereby distorting the findings. If it is in a school setting teachers and pupils may try to impress the researcher conducting the research at their school. The problem arising from this may then be that the findings will be a misrepresentation of the real facts. Mouton (2009:106) calls it the Hawthorne effect and it is a problem typically associated with experimental research designs. Besides ensuring the safety and upholding of the ethical issues the experimental design may have a problem of attrition if subjects do not find the activities interesting.

3.3.2   Action research strengths and weaknesses

Action research is a term used to refer to practical way of looking at one's own work to check whether it is what he/she likes it to be. This design assumes that the researcher as the person on the ground is the practitioner and the approach can be termed practitioner based research (McNiff 2002). This research design has some but not all of the components of an experiment it lacks random assignment of subjects to the control and experimental conditions (http://sociologyindex.com/quasi_experiment.htm). Matching is done instead of randomisation. The most important aspect of action research is that one has to be self reflective of all that transpires during the research. Self reflecting should always be objective view of the information from the research field. Self reflection helps the researcher to understand self and the phenomena undergoing research. Obrien (1998) insists that action

research is also known as participatory research simply because it involves action learning and contextual research. In this design the researcher identifies a problem and then does something to solve it. S/he checks on how successful the effort to solve the problem has been. If not satisfied the research tries again. The above views share common ground with the quasi experimental design in that in as much as it involves the researcher it also makes him/her the practitioner on the ground and the key person to the research.

The obvious advantage of the action research is that the research is able to determine the course of the proceedings in the research. The researcher has control over the activities and can dialogue, record and evaluate own actions and the behaviour of the subjects too. If something goes wrong in the research is able to trace the line of flow of events and render the required remedial action during the process of self reflection. The good about action research is that one is able to implement the action that produces good or desired outcomes in the research field. It therefore allows the researcher to develop certain actions during the course of the experiment. Action research makes use of the natural settings of the subjects and allows the researcher to go on for a longer time without creating an otherwise artificial environment for the subjects.

One of the disadvantages of action research stems from the point that personal involvement of the researcher the study can make the researcher to become biased and subjective. Notwithstanding the problem of subjectivity is unprofessional and researcher needs to strive to get rid of it in every way. Research is an academic process whose findings can be useful to the development of different aspects of life as such it should always be conducted in rather professional way.

3.3   Methodology

Mouton (2009:56) states that research methodology is the research process dealing with the tools and procedures used in research. Methodology gives details; the specific actions that the research takes through systematic means. The implementation of the research design is supposed to be done without bias for validity and reliability. Cohen and Manion (1980:26) assert that methods refer to the range of approaches used in research to gather data; these are used as the basis for inference and interpretation, explanation and prediction of findings. It is important to notice that the various approaches used to gather data constitute methodology and these should also be analysed so that strengths and weakness thereof can be appreciated. In corroboration of the above notion Hofstee (2009:115-6) says

methodology is a detailed explanation of how the research design is implemented. It is the justifiable route to the final results of the research. The research has to give all the details about every instrument that was used to extract data from the research field. Hofstee (2009:115-6) goes further to mention that research methods involve the use of instruments in the chosen research design. This research included a questionnaire, participant observation and teaching of pupils in both experimental and control groups. The individual instruments used in this research design will now be discussed, beginning with the questionnaire.

3.3.1   The questionnaire

The questionnaire as an instrument or method involves gathering information from a sample population using a set of questions based on the researcher's world view of the phenomena being researched (Chilisa and Preece 2005:109). In a situation where the sample is small, the distribution of the instrument can be done within a short space of time. Alternatively if the population sample is very large, enumerators can be hired to take the questionnaires to the respondents. Even if the sample is very big it can be sent by email or regular post and the respondents can mail it back. However, there was no need to use the email or post in this instance as the researcher and the participants interacted closely and met personally on a weekly basis.

Cohen and Manion (1980:80) uphold the notion that a good questionnaire should be clear and unambiguous. If the questionnaire has been properly planned, respondents can complete the questionnaire on their own without assistance from the researcher. The fact that the completion of a questionnaire is based on the respondents' voluntary choice means that the content of the same should encourage them to participate; a long and laborious one can discourage respondents from attending to it. The fact that the questionnaire is set up before the actual research can be an advantage for the researcher to put in place all possible measures to avoid ambiguity and controversy. To encourage a proper flow of ideas, Cohen and Manion (1980:81) encourage the researcher to plan for the questions so that they are simple at the beginning with yes and no answers. Some of the measures include running a pre-test survey after which one can then refine the instrument before the actual implementation.

Mouton (2009:103-4) says a pre-test to the questionnaire can reduce the source of errors especially where it is the principal method for the research. It is good to undertake a pilot

project to the questionnaire to appreciate the problems associated with the instrument in order to give leverage to the researcher to plan for a better instrument. A pilot pre-test was conducted at Pretoria Technical High School (PTHS). PTHS had a cultural week and the researcher was tasked with training a group of learners to play the *nyunga nyunga mbira*. The pupils were taught over a period of two weeks after which the questionnaire was administered to 15 pupils. From the responses of the participants in the pre-test some adjustments were made to the questions to make them more focused and relevant.

Advantages that come with the use of questionnaires are that the respondents' confidentiality is guaranteed and they can complete them without fear as they need not write their names on the questionnaires. Finally the researcher can administer the questionnaire with the respondents using diplomacy.

The administration of questionnaires could therefore be completed within a short time and the researcher left the respondents to complete and came later to collect the questionnaires, all of which were returned. Considering the ages of the subjects, the questionnaires needed the class teacher to be there in case they would require explanation to fill them in. I did not give any explanation to the teachers to avoid subjectivity. If the learners complete without the assistance of the teacher they may not understand some parts of the questionnaire and end up not answering the questions as intended. Analysis of the observations may be biased as the researcher was also participating as a facilitator. Even if objectivity is very difficult to maintain in the case where the researcher is an interested party it cannot be substituted with a one sided view. Nevertheless, the use of participant observation was the only solution as there was no other way to gather the same information. The use of audio and video recording meant that more concerted efforts to analyse the research findings could be done even after the research has long been finished.

3.3.2   Classroom teaching

According to Cohen and Manion (1980:183) teaching is concerned with action, converting generalisations into acts. The educator should deliver subject matter with a focus on the learners' needs; hence the preferred approach should always be child centred as advocated by both Dalcroze and Kodály, for example, in their teaching and learning theories in music education. Teaching was a primary method to gather data for this research. Although certain other teachers could have been asked to teach the *mbira* the researcher opted to do so personally. The teaching was in line with the Revised National Curriculum Statement grades

R-9, Department of Education (2003(a)) which spells out the expected outcomes for music, visual arts, dance and drama. The teaching was conducted in line with the school timetable for Arts and Culture. The teacher only served as a guide to the learners as they learnt how to play the *nyunga nyunga mbira*.

The advantage of teaching the pupils personally is that during the teaching and learning process they develop a working rapport that enables the achievement of objectives. In a classroom setting, pupil to pupil and pupil to teacher interactions take place and learning is highly likely to happen. In every lesson the teacher can give ample time for pupils to explore new knowledge and skills through a variety of activities. The activities can also help to reinforce the concepts acquired. During the afternoons the teacher can involve the children in some practice sessions with the instruments. The involvement of the researcher in the teaching gave the assurance that the focus of the research would not be deflected.

Problems associated with teaching are that concept formation takes place at different rates among the learners; hence teaching an instrument like the *nyunga nyunga mbira* might need a long time for the pupils to grasp the underlying basics. The fact that the whole project was an experimental research meant that it might enjoy support from both parents and teachers as they have core activities to do other than the *nyunga nyunga mbira*. The children can become frustrated if the instrument proves to be difficult. The teacher's role as researcher requires a lot of multi-tasking and observations should not be compromised as objectivity is supposed to be upheld throughout. It is therefore important that an assistant be engaged to do the shooting of videos and taking of photographs. Though there are some probable weaknesses with this method, such as subjectivity and lack of rigour, the inherent strengths outweigh the demerits thereof. The next instrument to be discussed is participant observation.

3.3.3   Participant observation

Participant observation requires that the researcher(s) be present in the setting up of the research in order to gather information. According to Chilisa and Preece (2005:155) participant observation is an important procedure for soliciting information from the research. Furthermore the researcher plays a vital role in the study as part and parcel of the whole project. Sometimes it is important for the researcher to let the participants know his/her objectives too. Alasuutari (1995:39) asserts that observations are findings that serve as clues; they should never be taken at face value. "Observations are treated only as clues,

which we try to interpret in one way or another in order to get 'behind' the observations." Mouton (2009:148) holds that participant observation takes a qualitative approach with an in-depth description of the group of people with textual data. In addition Mouton (2009:148) states that participant observation entails field studies in natural settings. This method has an advantage as the researcher takes part in the daily routines of the people. Observations that are made during research therefore offer in-depth insights. Cohen and Manion (1980:103) state that information gathered through participant observations is easy to account for, given that the researcher can discern the behaviour of the subjects and make appropriate notes about salient matters. Chilisa and Preece (2005:155) note that observations have the advantage that,

> Often researchers do not only hear what the participants say, but also see, smell and touch as they interact with the participants. Observation is another important procedure of gathering data. Researchers conduct observations to enable an elaborate discussion of a specific issue, corroborate findings, and triangulate or complement data gathered...

Participant observations have some disadvantages as observed by Cohen and Manion (1980:103) who say that, due to the long time taken in participant observations, the possibility of becoming intimate with subjects tends to influence the kind of findings that will be realised. The researcher becomes used to the subjects and the observations can be made subjectively, thus compromising reliability. Mouton (2009:104) also corroborates the above idea and mentions that due to non-standardisation of measurements, data collection and analysis of the same can be time consuming. For this reason the researcher may end up being biased and failing in rigorous analysis of the findings.

3.4   Sampling procedures

Sampling procedures take a central role in research since the findings from any sample should be able to be applied to the larger population. To ensure that the findings are consistent with the population, several approaches could be used to undertake the sampling procedures. Cohen and Manion (1980:74) submit that it is not possible to include the entire population in a research because of costs and constraints of impracticability; hence a sample is needed to conduct the research work. Sampling strategies depend on the viability and the type of research being conducted. In support of the above perception Alasuutari (1995:11) says that a sample should be representative of all the traits of the larger

population. It is therefore the responsibility of the researcher to come up with a sampling strategy that enables a balanced fraction of the population.

Firstly the researcher has to determine the size of the sample. Alasuutari (1995) indicates that the sample size makes it is easy to work and conduct a rigorous analysis of findings. Cohen and Manion (1980:74) recommend that a survey sample should be done in order to determine the size of the sample, otherwise there could be sampling error. Chilisa and Preece (2005:101) mention that the sample size is determined by the population characteristic; a bigger population would require a proportionally bigger sample to it. Cohen and Manion (1980:77) note that the size of the sample depends on the purpose and nature of the population under study; however, they state that in some instances the minimum sample size is 30 if the researcher plans to use some of the statistical analysis in his/her data. It should not be taken as a necessity to have a sample of 30 subjects in any research, though. A reasonable sample should primarily justify the purpose of the research. This research design involved an experimental approach and two groups with 30 pupils each was the preferable size. In the next paragraph the sampling procedures for the research are discussed.

Mouton (2009:123) says it is important to explain the sampling method and criteria used to choose the sample and the size. Simple random and systematic sampling procedures were employed to select the pupils to be included in this research. With simple random sampling every member of the population has a chance to be selected and thus no one may have the advantage of being included or the disadvantage of being excluded. The problem with this strategy is that the researcher is required to have all the details of the entire population in order to make the random sample even. This is a problem when dealing with a big population.

The first thing is to determine the sample size and then do the sampling procedures. In this research the determinant factors were the availability of *nyunga nyunga mbira* instruments and the requirement that the group be of a manageable size to allow ample practical work. In this instance the maximum ideal sample size per group would be 20, as this is manageable for practical instrumental teaching. Cohen and Manion (1980:75) insist that systematic sampling is a selection that is based on a detailed list of the members of the population. The population is subjected to a systematic process to choose members that must be included in the study. The members of the population are numbered and a choice of either every fourth, fifth, or sixth member will be made. Systematic sampling is conducted to choose a sample

for the experimental and control groups. The advantage is that it allows the placement to be done with transparency. With the use of class lists the pupils can pick cards with numbers and those with odd numbered cards form one group and the even numbered form the other group. The expediency of this method is that the researcher does not have to decide choice and placement of subjects in the group. The disadvantage with random sampling is that if the population is too big it can be arduous and cumbersome if details cannot be accessed. It therefore works effectively with small populations whose samples are proportionally small. Convenience sampling was also used in this research design.

Convenience sampling takes advantage of the subjects' nearness to the researcher's research field or otherwise any reason that implies convenience regarding their involvement in the research. Cohen and Manion (1980:76) talk about convenience as choosing the nearest individuals to be included as subjects in any research. The ease it brings is that inclusion is not criteria specific. It saves time and energy from conducting a rigorous routine to select subjects. It can be good if the subjects are willing to be part of the research. This type of sampling is, however, problematic if the subjects are not ideal for the research. It creates a problem if the convenient subjects are not the intended target. Convenience sampling is likely to misrepresent the findings if a wrong sample is selected. Hence a sampling procedure may need to safeguard against unforeseen and unpredictable outcomes. The subjects involved in the research were suitable in that they had never played the *nyunga nyunga mbira* before. The cultural and ethnic diversity of the learners presented a lucrative opportunity for an experimental research of this magnitude. In regards to the suitability the sample for this research was therefore ideal.

3.5   Data collection

Data collection is concerned with the gathering of information using some specific instruments. Mouton (2009:123) says one should give the details of the data collection process including the access to the subjects, procedures and the techniques used. Cohen and Manion (1980:27) say, "The term data is used in social research to represent the information gathered by investigators with the aid of their instruments, techniques and other means." Furthermore Cohen and Manion (1980:27) mention that, "Data constitute the basis for decisions as to whether certain theoretical hypotheses should be confirmed, for the interpretation and explanation of human behaviour and for making inferences and reconstructions." Data collection is therefore a critical stage of the research as it seeks to find information that helps describe the problem and/or the phenomena in the research. In

order to make inferences and offer explanations regarding the research problem (chapter 1.3) and hypothesis (chapter 1.4) the researcher did the data collection at Pretoria Chinese School.

The endeavour of this researcher was a comparison of the indigenous method of teaching *nyunga nyunga mbira* with a proposed modern technology-assisted method. The data were collected through participant observations during teaching and learning in the classroom set-up and after school practice sessions. The process of data collection was done using the questionnaire, observations and lesson teaching. Collection of data commenced on the 9th of September and ended on the 10th of November 2010. Prior permission was sought from PCS to conduct the research. Permission letters were sent through to the school and consent was given.

The research was conducted at PCS with 30 pupils. There were two groups, one being the control while the other served as the experimental. Each of the two groups had fifteen learners. Group A was set as the experimental and group B the control. For every lesson the researcher prepared a lesson plan for the learners and involved them in learning the *mbira* tune. The Kukayiwa *nyunga nyunga mbira* tune was taught to both groups. All the teaching in the experimental group was conducted with the use of technology-assisted instruction which involved Sibelius notation software on the overhead multimedia projector.

Teaching with modern technology was a shift from the usual traditional African approach of teaching without a form of notation. The teacher explained lesson content with the use of the notation on the overhead projector with practical demonstration too. All the work that was done in the experimental group was based on staff notation. The *nyunga nyunga mbira* tunes were presented and played in the Sibelius software package. Each *mbira* section was only two bars long and pupils were allowed to see, hear and play the two bars of the tune. After each lesson an evaluation was made of that session. For every lesson all the events that took place were entered into a diary. Learners were also asked to fill in a questionnaire at the end of the research (see the sample of the questionnaire appendix I). During the proceedings photographs and audio recordings were also made of the lessons (see pictures in appendix V and listen to the audio CD tracks 1 to 15 in appendix VI). The other learners in the control group were taught without the use of any technology-based instruction.

The control group was taught using the indigenous method of teaching by rote. All the proceedings of the lesson were done using the power of memory and minimal chalkboard

illustrations such as sketches and number cues. The same content that was taught in the experimental group was used, including the activities and the *nyunga nyunga mbira* tune. Reference was made to the key numbers only, without writing on the board or paper. A diary of the events was kept to enter all the important issues. The lesson plans for these classes were evaluated and filed. Just like the experimental group the control group was also given questionnaires to complete. All the returned questionnaires were collected and all the data subjected to some analysis.

3.6   Data analysis

According to Mouton (2009:124) the researcher should establish the rationale for the choice of the data analysis procedures and the actual procedures. In addition to discussing the data collection procedures Mouton (2009:124) insists that discussing the limitations and possible loopholes of the procedures used is necessary. In the light of the notion raised by the above authority this section will therefore present the data analysis. Data analysis enables readers to understand how meaning of the results is derived and also to see whether the research is reliable. A casual data analysis does not produce dependable results. Chilisa and Preece (2005:27) refer to data analysis as a process that starts after data collection, thus

> Statistical procedures are essential tools for the analysing, summarising and presenting results. Statistics, as well as tables and graphs, are used to report findings .The researcher. Uses impersonal language to report findings and omits statements about value from the written report.

The purpose of data analysis is to make meaning of what could otherwise be meaningless if analysis is not done. It is important that at this stage of the research a discussion of data be made to enable analysis to be done. Data analysis is the critical part of the research as it enables one to make inferences, interpretations and establish positions and trends relating to the problem, hypothesis and the research objectives (Mouton 2009). If the gathered data cannot be interpreted, the whole research is rendered futile.

Successful research is underpinned by an honest and meaningful interpretation of data. In this research, data gathered through the questionnaires was placed in tables, percentages and figures with the intention to establish statistics. The lesson evaluations were also presented using descriptive statistics. Comparisons of the achievements by learners in each group were made, using tables. A parallel comparison of the key aspects for the lesson

objectives was entered into the table columns and each group's statistics entered for analysis. The observations were also analysed together with data gathered through the lessons. All the video and audio excerpts were also analysed to establish trends as observed during the research. The analysis was based upon the performance of the learners and the answers to the questionnaires. The analysis of learners' performance centred on the four sections of the Kukayiwa tune in terms of tempo, accuracy of notes and the confidence to perform as individuals, in a group and as the whole class.

3.7   Analysis of the control and experimental groups' lessons

The table below presents the summary of the two groups involved in the research. Figures are used to explain the different scenario that obtained during the different lessons throughout the research. The table shows a summary of the proceedings in each group from day one and a column indicating the observations made as a comparison of the two groups.

Table 3.1   A comparative analysis of the control and experimental groups

Lesson	Control group	Experimental group	Observations
1	Learners played Kukayiwa 1 quite well; 6 children complained of itching fingers.	They struggled to read the notation; they could not play the Kukayiwa 1 for one cycle.	The control group moves ahead of the experimental group in terms of content coverage.
2	10 pupils played the Kukayiwa 1 with confidence 5 of them could not.	All the pupils played the Kukayiwa 1 with an erratic tempo.	Both groups have a problem of keeping a consistent tempo.
3	Kukayiwa 2 was introduced and 11 pupils did well; 5 complained of itching fingers.	The projector helped and 10 pupils played Kukayiwa 1 with confidence; 5 struggled.	The control group is ahead of the other but they all have a similar problem of keeping tempo.
4	Kukayiwa 3 introduced. 8 pupils did well; 5 pupils struggled with it and 2	Kukayiwa 3 not introduced 10 pupils worked on Kukayiwa 1-2 3 pupils complain of	The experimental group lags behind but they all have pupils complaining of hurting their fingers.

	could not do it.	hurting fingers.	
5	Kukayiwa 4 challenging to the children. However, 11 pupils did well; 4 could not.	Kukayiwa 3 introduced. 12 pupils played well; 3 could not.	Both groups did well except that the control group is a lesson ahead of the experimental one.
6	Kukayiwa 1-4 about 6 pupils played with an erratic tempo; 9 pupils played up to Kukayiwa 3.	About 9 pupils were either too fast or too slow for the tempo of the notation. 6 struggled with Kukayiwa 3.	The control group struggled with their tasks. The experimental group does well though it is behind schedule.
7	The change of number system did not affect the pupils' performance. About 9 pupils played well with a consistent tempo.	The change of numbering system affected the pupils positively; they played very well. 10 played very well and the remainder of 5 played with stops.	A very drastic change in performance takes place with the experimental group. No remarkable change is noticed with the control group.
8	Five pupils did well with the high notes of Kukayiwa 4. The problem of tempo still evident among all of them, especially performing as the whole class.	Kukayiwa 4 was executed with ease. For the first time they played well as group. Just a small problem with keeping tempo.	The experimental group does well with the Kukayiwa 4. Just a small problem of keeping tempo, as with the other group. The groups are now at par.
9	They had problems with the high notes in Kukayiwa 5. They could not join it with the other variations smoothly. The problem of tempo was observed again.	With the aid of notation on the projector they played Kukayiwa 5 with ease. By the end of the lesson they played without looking at the scores.	The use of notation helped the experimental group to play the Kukayiwa 5 with fewer problems. They even played without the score. The control group struggled with keeping tempo.

10	Pupils performed together, as pairs and individuals. They still could not maintain a constant tempo. However, they seemed to enjoy the instrument.	Kukayiwa 1-5 was done with the use of notation and they did well. They struggled a bit without it, especially on variation 5. They tended to forget the second series high notes.	The two groups could not keep tempo when performing as class. The learners have never played together but a mini concert is set for them to play together.

The commencement of the research saw the experimental group lagging behind the control group. The introduction of the *nyunga nyunga* instrument, its structure and background together with the principles of the computer-assisted method took time. The group ended up lagging behind for seven sessions; however, as the researcher with interest in finding out how the method worked it was objective to only let the group perform up to their ability and not to push them to match up with their peers in the control group. The group was therefore not informed of their status quo.

From the above table the performance of the two groups was more or less closely matching towards the end of the research. The use of the computer-assisted method to teach *mbira* performance was somehow a process that the participants were getting to understand better with each session they were involved in. It comes as no surprise that after the seventh lesson the method gave the learners the advantage of doing something that the other group could not do. With the computer-assisted approach the learners were able to do the first high notes on their own as they were guided by the audio and visuals projected on the screen.

Some participants from both groups complained of itching fingers. They also had a problem to keep a consistent tempo, especially in class performances. It was noticed that the learners performed badly especially where they got excited of playing a difficult section of the Kukayiwa tune.

As the researcher, my involvement in the data collection afforded some close interaction with a number of the participants from both groups. They all had fun with the instrument. On a sad note some participants genuinely experienced pain in plucking the instrument, especially those with very short finger nails. The complaints became fewer as the research gathered momentum, coupled with the reason that the participants were getting used to the playing technique of the instrument.

It is crucial to notice that pupils were more or less of the same age and they had similar problems and challenges. The complaints concerning itching fingers is a sign that not all pupils would have heeded the precautionary measures given to them by the researcher. Considering the ages of the participants it was always important to explain the precautionary measures when required to do so. With older learners a handout on precautions would have normally been given at the onset the research. However, the young learners at PCS required the instructor to remind them of the precautions on the handling and playing techniques of the instrument throughout the stages of the teaching of *nyunga nyunga mbira*.

3.8   Summary

The main points of this chapter were to discuss the research design and the methodology as envisaged in this research. The research design was a combination of action research and a thrust toward an experimental approach. The discussions included establishing the strengths and probable weaknesses thereof. In this research primarily questionnaires, participant observation and teaching were used as instruments for data collection. The merits and demerits thereof were also explored. It was also imperative for this research to investigate the sampling procedures. Simple random, systematic and convenience sampling procedures were preferred options for the research. The researcher also explained the strengths and weaknesses of the chosen methods. The final part of the chapter focused on the data collection, explaining how this was gathered and the proposals for analysis of the same.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The function of this chapter is to present an analysis and discussion of the research findings. The analysis is pivoted on dealing with the key issues as were elaborated in the statement of the problem and the main research question. Mouton (2009:107) postulates that, "... experimenters keep a detailed record of all protocols and procedures implemented during an experiment or trial." The analysis therefore concerned itself with the details, procedures and observations made during the quasi-experimental research. The research was focused on comparing two methods on the teaching of the *nyunga nyunga mbira* to first time learners. The data collected through observations, teaching and questionnaires is presented and analysed under sub-topics. The researcher uses percentages, tables, figures and descriptive statistics in his discussion of the data. The sub-themes to be analysed include the traditional approach and the computer-assisted method in the teaching of the *nyunga nyunga mbira* and the use of indigenous musical instruments in the learning area Arts and Culture.

4.2 The African traditional method in teaching the *nyunga nyunga mbira*

The African traditional method was used in this research to assess its effectiveness in comparison with the computer-aided method to teach the Kukayiwa *nyunga nyunga mbira* tune at Pretoria Chinese School. Observations were made during the course of the teaching sessions. The discussions in this sub-section include the teaching-learning experiences and the observations thereof. The ensuing sub-topic concerns the control group, in comparison with the experimental group at the school, referred to in the introduction.

4.2.1 The control group at Pretoria Chinese School

The control group had 15 learners with an average age of 12 years. The Kukayiwa tune was divided into four sections and this was taught using the rote method. The following paragraphs present the observations that were made during the course of the research. Although the ethnic

background of the participants was not considered as an important variable, it is vital to notice that the participants were of diverse ethnic orientations. Ethnicities among the participants included Chinese, Korean, Zimbabwean Shona/Ndebele, South African Pedi/Sotho/ Zulu/ Venda/Indian, Coloured, Italian, Afrikaans and English (see the photographs in appendix V).

4.2.2 The *nyunga nyunga mbira* lessons

- Lesson 1

Lesson one was an introduction to the *nyunga nyunga mbira* and the learners were exposed to the structure of the instrument, parts and the numbers of the keys and the ways to produce sound on the instrument (see the picture of the *nyunga nyunga mbira,* figure 2.3a, in chapter two). The objective of the lesson was to play the basic chords for Kukayiwa 1. The basic chords for Kukayiwa 1 were taught in this lesson. The instructor used the key numbers to teach without writing anything on the chalkboard. By the end of the lesson all the children could play the basic chords, mostly as individual performers. Even though counting them into the performance was made use of, it appeared not effective to keep them playing with a steady beat, as they always increased the tempo, especially with the excitement of being able to play the instrument (listen to the audio example for the control group, Kukayiwa 1 track 1 appendix VI). The learners were overexcited about playing the *mbira.* About six learners complained of the instrument hurting their thumbs. Nevertheless, the lesson objective to play Kukayiwa 1 chords was achieved.

- Lesson 2

The lesson was introduced with a revision of the previous lesson's Kukayiwa 1 and the pupils were even more excited than previously to have their hands on the instrument. The learners were then challenged to play the melodic second section to the first lesson and the problems to maintain tempo were observed as they performed in threes and twos. The overall observation was that, of the 15 pupils, 10 were able to play both the basic chords Kukayiwa 1 and 2 with confidence. The rest played Kukayiwa 1 section with too many stops. However, it is to be expected to have pupils develop at different paces. Passing judgement at this point would be unfair.

- Lesson 3

In this lesson the effort was to ensure that learners play Kukayiwa 1 with confidence and then join it with Kukayiwa 2. The teacher demonstrated how to join the two sections and play without breaking. The class was met once again with the problem of erratic tempo as the learners were seemingly competing among themselves. The researcher then had to explain the importance of keeping time in order to enjoy the performance. The overall class performance was not well executed (listen to the control group in the enclosed audio CD, track 2 appendix VI). The best displays were done by individual learners and not by the class in their performance as a whole. Having sufficient instruments for all learners performing as a group was one of the most ideal and important experiences for the learners. However, 11 learners did well as individuals with the rest complaining of itching fingers.

- Lesson 4

Proceeding with teaching new material depended on the success of the previous work. As the majority of the learners had grasped the section 1, the pupils did a skills practice as a class. Before the end of the class the learners were supposed to showcase what they had learnt. This was a development from the previous lesson; 8 pupils were able to play with confidence sections 1 and 2 of Kukayiwa and the rest played section 1. Their attempt on joining section 1and 2 was not well done. More time for practice was probably needed. Learners develop differently and hence time was given for those making slower progress to eventually catch up with the rest.

- Lesson 5

The lesson was meant to teach the learners to play section 1 to 2 of Kukayiwa and join it with section 3. Kukayiwa 3 has high notes which are played with the index finger. The concept ideally requires a slow tempo until the learners are confident. The use of the index finger was not easy for the pupils therefore the lesson was devoted to playing the new high notes only. Observations showed that the introduction of high notes was the most challenging since the beginning of the *mbira* playing. The only way to solve the problem was through a practical step-by-step demonstration with a slow tempo. At the end of the lesson 11 of the pupils managed to play through to the end, although they did that slowly. The other 4 could not play the high notes

and they mentioned that it was very difficult. Despite their claims, they still demonstrated some potential to do well with playing the high notes because it was clear that their main problem was playing with too many breaks.

- Lesson 6

The lesson was meant to concentrate on joining the first series of high notes in Kukayiwa 3 to Kukayiwa 1 to 2 (listen to the audio CD track 3 appendix VI). The learners could not keep tempo because they had developed the habit of slowing down the high notes. The solution to the problem was to start with the previous sections of Kukayiwa with a slow tempo. Even though a slow tempo was made use of, the onset of the high notes was met with a sudden erratic performance, and that did not sound well for the class work. A way out of the problem was to subdivide the class into two, with some playing the basic tune and others playing up to section 2. In the end 6 pupils managed to play through to the high notes within the set tempo. The rest could play the section 1 and 2 but got stuck at the high notes. The idea of joining Kukayiwa 1, 2 and 3 was shelved to allow learners to polish the previous sections.

- Lesson 7

After going through the previous lessons the researcher decided to change the number system from using 1-15 to the use of only 1-4 numbers (see figure 4.1 of *nyunga nyunga mbira* on the numbering of the *mbira* keys). To the surprise of the instructor the learners quickly adjusted to the new numbers and were able to learn more easily using the new number system. From the same day the numbering system was adjusted to 1-4 there was a change in the way the learners grasped the tunes. At least 9 pupils played the sections 1to 3 with a consistent tempo, while another 4 played with an inconsistent tempo from the beginning of the tune to the end of section 3. The remainder of the class complained of itching fingers and elected to stop.

- Lesson 8

In this lesson the second series of high notes in Kukayiwa 4 were done through practical demonstration using the numbers. Kukayiwa 4 utilised both the right thumb and the index finger and for that reason it was easy to demonstrate but the problem of itching of fingers became more evident, as the children complained. There were nevertheless about 5 pupils who played

so well that it seemed unbelievable. I later on found out that all of them had started playing the piano at the age of seven and were already proficient on that instrument. They could play with a constant tempo. Amazingly all the 5 could also play as a group without a problem. The rest of the class played but they had a lot of breaks to the flow of the performance.

- Lesson 9

The aim of the lesson was to join all the sections together and perform the whole tune with a consistent tempo. The observations made thus far indicated that there was a problem with class performances as every learner was somehow obsessed with performing and wanted to speed their performance, perhaps due to excitement, thus failing to keep a constant tempo. Even though a manageable tempo was used they insisted on increasing the tempo. The researcher did not want to have a smaller group that would play a constant basic tune to guide others because all of the learners were supposed to play the new high notes in Kukayiwa 4. Instead the pupils were given the opportunity to play the different sections in turns to allow others to learn from their peers. The instructor demonstrated the way the sections were supposed to be played and counted them into the performance. The demonstration helped and the resultant effect was that the second high notes were played well by the whole class. However, the high notes were not joined to the previous section to avoid complicating the performance (listen to audio CD track 4 appendix VI).

- Lesson 10

This lesson was meant to bring all the skills together and perform in a mini concert of some sort. The general expectations for the lesson were explained to the learners and they were given sometime to practise. With guidance from the instructor they performed fairly well, even though the problem of an inconsistent tempo was still evident (listen to the audio example track in enclosed audio CD track 5 appendix VI). Even where individual performances were good it was the problem of erratic tempo that marred the class performances. After this lesson it was decided to perform in a mini concert for the parents. The concert performances of the *nyunga nyunga mbira* were also recorded and are herewith presented on the audio CD tracks 11 to 15 in appendix VI.

- Assessment of skills

An informal assessment of the pupils was done because there was a need for it at this stage. The school required an assessment of the pupils and audio recording of the same was done. Just to ascertain the skills acquired by the learners the pupils were asked to perform to a few parents and teachers on the afternoon of the last day at PCS. It was quite an excitement for the pupils and for the first time they were performing with their counterparts from the experimental group. As they all performed there was no evidence to show that they were exposed to the instrument through different methods. The kind of assessment was such that no pressure was exerted upon the learners. Conducting the assessment in a rather informal manner eased the pressure that is experienced by learners during the course of the last term of the year. As a result it was fun and exciting yet the purpose of the day was realised. The resultant performance by the learners was satisfactory (see the schedule of marks on table 4.1).

Table 4.1   Assessment marks for the control group Pretoria Chinese School

Kukayiwa	Section 1		Section 2		Section 3		Section 4		Sections 1-4	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
One cycle Individuals	15	0	15	1	14	2	13	1	12	4
One cycle class work	10	5	10	5	9	6	8	7	7	8
Two cycles class work	10	5	10	5	8	7	9	6	7	8
Pair work one cycle	12	3	10	5	13	2	11	5	10	5
TOTAL	48	12	45	15	44	16	41	19	36	24
Percentage	78%	22%	75%	25%	73%	27%	68%	32%	60%	40%

The group had their best performances when they performed as individuals; from the onset of the assessment their average performance was about 13 learners doing very well. The class work was done with an average of 9 pupils performing well. Of note is the pair work which was their second best performance with an average of 11 learners performing well. Though the group started off on a very high of performance for section 1 with (78%), they could not maintain it and they dropped to 75% at section 2 and 73% at section 3. The performance went down as low as 60% at playing all sections Kukayiwa 1-4. The total average performance for the whole group is thus 71%. The final average performance indicates that at least 11 learners did well

consistently at all the sections throughout the assessment. The totals average 354 resembles 71% a mark that lies within the upper third quartile range of marks which is above average.

4.3   The modern technology-assisted method

The computer-assisted approach was used in this experimental research to explore its effectiveness in teaching the *nyunga nyunga mbira.* The same tune, Kukayiwa, with four sections was taught to the experimental group of grade six learners. In spite of the use of a different method of instruction the learners were exposed to the same activities and learning experiences as class, individuals and pairs. The ensuing paragraphs are the data presentation and analysis of the experimental group through the computer-assisted method.

4.3.1   The experimental group at Pretoria Chinese School

The group received instruction with the aid of the Sibelius software package on the overhead multimedia projector. The pupils had an opportunity to see, hear and experience the actual music and notation of the Kukayiwa tune from section 1 up to 5.

4.3.2   The *nyunga nyunga mbira* lessons
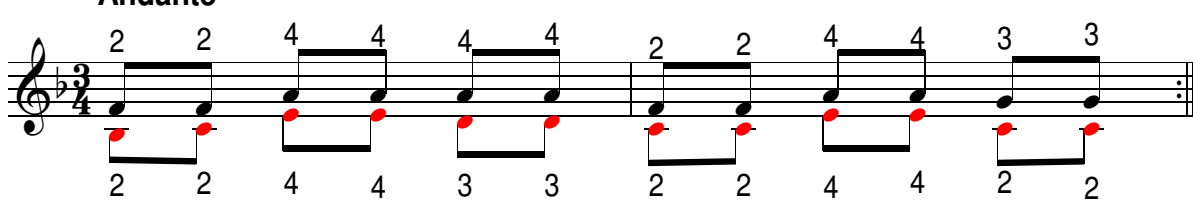
- Lesson 1

Lesson one was an introduction to the *mbira* instrument, naming the parts, learning the plucking technique and precautionary measures to avoid itching of fingers. The use of staff notation rather than just rote learning was also introduced. With the aid of a notated Kukayiwa 1 *mbira* tune in Sibelius, the instructor demonstrated how to read music and play. The first lesson only involved the basic chords played by the thumbs. To facilitate reading, the notation used red for the right thumb notes and black for the left thumb. The majority of 10 pupils struggled to read and play at the same time. However, 5 pupils played the chords with ease as they could read the music too. It was too early to pass judgment on the individual and class performances because more time was needed to perfect the skills to read music from the five lines and four spaces.

Example 4.1   Kukayiwa tune section 1

Kukayiwa 1
split chords

Transcribed by Muranda R.

Andante

Maraire A. D.

The red numbers are played with the left thumb
the black ones are played with the right thumb

- Lesson 2

In the second session of the experiment the pupils began to show signs of grasping the whole approach of notated scores. They managed to play the cycle of the Kukayiwa 1 tune very well. Their problem was that all the pupils in the group wanted to show off and hence the class performance was not done properly since they could not keep a consistent tempo. However, as a way to counter this problem, pupils were asked to play in twos and threes while others observed. Performance in small groups proved to be good as all the children then played smoothly through the full cycle of Kukayiwa 1(listen to audio CD track 6 appendix VI).

- Lesson 3

At this stage of the experiment the learners were able to identify the fingering positions for the *nyunga nyunga mbira* once they saw the notation on the screen. The Kukayiwa 1 was demonstrated through the multimedia and then learners were challenged to play according to the notation. The first problem was that once they started playing they did not listen to the tempo and hence they tended to get either too fast or at times too slow. Increasing the tempo of the tune was also problematic in that the pupils would lag behind. The instructor managed to play smaller segments and challenge the learners to play the short phrases. At the end of the lesson 10 learners managed to play the chords quite well while 5 of them struggled to play to the end of the tune.
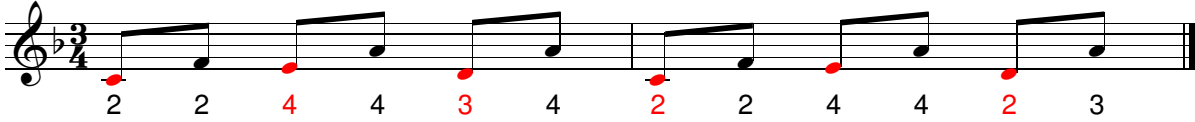
Example 4.2   Kukayiwa tune section 2

Kukayiwa 2
split chords

Transcribed by Muranda R.

Maraire A. D.

Andante

2   2   4   4   3   4   2   2   4   4   2   3

The red numbers are played with left thumb
the black ones are played with the right thumb

Copyright © 2010

- Lesson 4

In this lesson the Kukayiwa 2 was to be introduced through the multimedia projector since the majority of the learners had grasped Kukayiwa 1 in the previous lesson. However, to make sure that the pupils acquired the pertinent skills it was necessary first to polish up Kukayiwa 1 before the new section could be taught. At the end of the class the learners showcased their skills. Overall, 10 pupils played both Kukayiwa 1 and 2 well. Three learners still complained of itching fingers and the other two struggled to play Kukayiwa 2 (listen to audio CD track 7 appendix VI).

- Lesson 5

It was evident at this point that the experimental group was lagging behind the control group in terms of coverage of concepts. This backlog was a result of the fact that the first lesson was difficult for the group as the instrument was introduced through a new approach; the learners needed ample time to understand the instrument and the underlying concepts. The pupils went through Kukayiwa 2 with the aim of polishing the section and they played it well. The learners were not asked to join it with the previous section to avoid confusion because Kukayiwa 2 required the separation of keys. The majority of the pupils found the lesson challenging, especially separating the notes. In spite of the difficulties that the pupils faced, 12 of them managed to play the score keeping the set tempo. The rest of the class played but they had too many stoppages, especially when they performed as class (listen to audio CD track 8 appendix VI).

Example 4.3   Kukayiwa tune section 3

Kukayiwa 3
First high notes

Transcribed by Muranda R   Maraire A.D.

Andante

2   2   4   4   3   4   2   2   4   4   2   3

The black numbers are played with the left thumb
The green numbers are played with the index finger

Copyright 2010

- Lesson 6

The lesson objective was to enable the learners to play the sections Kukayiwa 1 to 3. Though the computer provided the learners with a consistent tempo they were too erratic for the notation. The solution to the problem was to start off with a slow tempo. Even though a slow tempo was used as they could not stick to the beat and that did not sound well for the tune. The instructor had to subdivide the class into two with one group playing the basic tune continuously and the others playing the three sections. In the end 9 pupils managed to play through to the high notes within the set tempo. The rest could play the sections 1 and 2 as they struggled with Kukayiwa 3 (listen to the audio CD track 9 appendix VI)

- Lesson 7

The lesson was met with a paradigm shift from using the numbers 1 to 15 to the use of only four numbers 1 to 4 (see the picture of the *nyunga nyunga mbira* figure 4.1 below, especially the numbering of the keys). To the surprise of the instructor the learners adjusted to the new number system with ease. They were able to learn well through the use of the new number system. From that day there was a change in the way the learners grasped the tune. At least 10 pupils played the sections with a consistent tempo, while another 4 played inconsistently but from the beginning to the end of Kukayiwa1-3. Only one learner complained of itching fingers and hence took a rest.

Figure 4.1   The *nyunga nyunga mbira* numbering of the keys

- Lesson 8

Example 4.4 Kukayiwa tune section 4
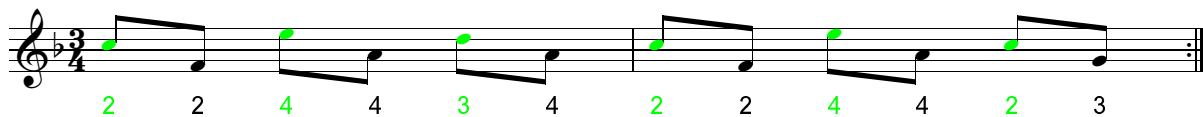

Kukayiwa 4
Second high notes

Transcribed by Muranda R

Andante
                                        Maraire A.D.

The black numbers are played with the left thumb
The green numbers are played with the index finger

Copyright 2010

In this lesson the second series high notes in Kukayiwa 4 were introduced through practical demonstration, using the numbers with Sibelius notation on the overhead projector. For Kukayiwa 4 the pupils only needed to use the left thumb and the right index finger. The pupils noticed the pattern of just using the thumb and the index finger and played and managed to execute the high notes quite well. 6 pupils played the new section with ease and joined it with the previous sections. A noticeable feature was that individually they played with ease and

consistency. The class work was, however, marred with the problem of ever increasing tempo. Nevertheless at the end all the class played as a group with only a slight tendency to accelerate the tempo of the especially when they tried to join Kukayiwa sections 1 to 4.

- Lesson 9

By the end of this lesson the learners were expected to play the four sections up to Kukayiwa 4. Indeed the learners were able to join the four sections together and perform the stages of the tune with a consistent tempo; this is perhaps the advantage of the notation on the overhead. Although the problem of failure to keep a constant tempo was evident especially in class performance, an improvement was realised once they followed the score on the overhead projector. Even though a manageable slow tempo was used they insisted on increasing the tempo. The researcher used the computer to play the basic chords of Kukayiwa 1 and all of the learners played the second series high notes in Kukayiwa 4. The instructor played the basic chords and counted the learners into the performance. This approach helped to ease the problem of tempo and keeping track of the flow of the performance and at the end 6 learners did the first high notes quite well without the aid of the notation. The rest of the class did well with the help of the notation (listen to audio CD track 10 in appendix VI).

- Lesson 10

The purpose of the lesson was to bring all the sections of Kukayiwa together and perform them as one tune together. The learners were given the opportunity to showcase their skills and play through each of the sections 1 to 4 of Kukayiwa. The work was done in a relaxed atmosphere and the pupils were not placed under pressure to perform well. It was also an opportunity for the pupils to show their friends and parents their new skills in playing the instrument. The computer assistance had to be stopped to allow the performance of the instrument to be natural. The learners played all the sections of Kukayiwa, but the problem of an inconsistent tempo was still evident.

- Assessment of skills

All the pupils in the experimental group were assessed on their skills to play the instrument as individuals, in pairs or threes and as the whole class. The researcher used an informal

assessment of the pupils to avoid placing a lot of pressure on them. The assessment was done because there was a need for it, as part of the school requirements. It was also an opportunity to create an audio CD and DVD for archiving at the school. With the help of the Arts and Culture teacher the assessment of the pupils was done and an audio CD of the same was recorded (listen to concert performances on audio CD tracks 11 to 15 in appendix VI). The resultant performance by the learners showed that they were developing with each lesson. However, the last lesson for the research ended with a satisfactory performance (see the schedule of marks in table 4.2).

Table 4.2 Assessment marks for the experimental group at Pretoria Chinese School

Kukayiwa	Section 1		Section 2		Section 3		Section 4		Section 1-4	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
One cycle Individuals	12	3	14	1	14	1	13	2	12	3
One cycle class work	9	5	10	5	9	6	8	7	9	6
Two cycles class work	8	7	9	6	9	6	8	7	8	7
Pair work one cycle	14	1	12	3	13	2	12	3	10	5
TOTAL	43	17	45	15	45	15	41	19	39	21
Percentage	72%	28%	75%	25%	75%	25%	68%	32%	65%	35%

The figures in the above table were calculated on the basis of playing from the beginning to the end of each section. The learners were expected to play sections 1 to 4 as individuals, pairs and class. The performance had four sections and the number of those that played through to the end were placed under Yes and those who could not under the No column. That essentially means that each learner played four times within a group of 15 members. The total number of performances per section was 60. The group that had the highest number of learners playing to the end would get a possible total of 60. A total of 15 students were entered and the number of those who did well was placed in the Yes column and those who did not in the No column. The percentages were worked out of the total possible of 60 per section. The above table indicates a trend where marks are going down as the sections increase. Perhaps the explanation for the diminishing marks is that the performance exercises were getting tougher as they went up the ladder. The learners' individual performances were the best for all sections with an average of 13 learners doing very well. The performance drops to an average of 9 as they performed as class. The performance of each section further drops at two cycles of class work to an average

of 8 and that is the lowest. The most prominent problem in class performance was failure to stick to a constant tempo. However, the pair work was better than class work in that the average was 12 learners doing well per section. The total average performance shows that the group was very consistent from Kukayiwa 1 to 3 but dropped their momentum from section 4 with 68% to 65% at playing all sections 1-4. On the whole the group managed to do well considering they were playing the instrument for the first time in their lives. The final total average performance for the experimental group is 355 constituting a 71%, meaning that an average of 11 learners did well throughout the performance.

4.4 Analysis of the control and experimental groups

It is important to look at the facts and figures from the lessons and the final assessment in carrying an analysis of the effectiveness of the traditional method and the computer-assisted method in the teaching of the *nyunga nyunga mbira.* It was not possible to make a comparison without the details of the lesson observations. The details of the lessons have already been discussed and from here a comparison of the two groups should be presented now.

Summary of the assessment of the control and experimental groups

Table 4.3   Final average performance of the control and experimental groups

The control group	Section 1		Section 2		Section 3		Section 4		Section 1-4	
TOTAL	48	12	45	15	44	16	41	19	36	25
Percentage	78%	22%	75%	25%	73%	27%	68%	32%	60%	40%
The experimental group										
TOTAL	43	17	45	15	45	15	41	19	39	23
Percentage	72%	28%	75%	25%	75%	25%	68%	32%	65%	35%

The two groups are more or less closely related in terms of performance. The first thing is that they did their best performances at sections 1 to 3; both groups scored more than 70%. The control group took off with a high performance of 78% thus leading the experimental group which had an average 72%. Whereas the control group was losing momentum it appears the experimental group was gaining it. At section 2, the two groups perform exactly the same with 75% apiece. However, at section 3 the situation changes: the experimental group maintains

4-14

their 75% while the control group loses momentum and gets a 73%. The groups are tied in section 4 at 68% as they scored similar marks again. From section 4 both groups lose their upward trend; at this point the experimental group finish with a 65% while the control group earns 60%. After collating the averages both groups are tied at a performance rate of 71%. In spite of the fact that the results for both groups are tied at 71% the final marks show a trend that the experimental group did better than the control group right at the end Kukayiwa1-4 combined sections.

4.5 Information from the questionnaires

A total of 30 questionnaires were given to the participants; all of them were returned to the researcher. The information gathered through this instrument was collated and will be discussed and analysed accordingly. In order to analyse and discuss the findings of this research the presentation is done with focus on the specific issues solicited through the questionnaire.

4.5.1 How many traditional instruments do you play?

Out of the 30 questionnaires all the respondents claimed that they could play at least the African drum, marimba and the *nyunga nyunga mbira.* However, there are some other instruments that were listed by the learners in addition to the drum. The most common African instrument among all the respondents was the drum, 24 pupils indicated they could play marimba; that also represented 80% of the sample. The *mbira* was obviously mentioned as one of the instruments but in this research it will not be considered for analysis because the information is insignificant to the performance of the same. The shakers and rainmaker were listed by 15 participants. The above statistics help to appreciate the connection between playing other instruments and the *mbira.*

Table 4.4   African instruments played by participants

| Instrument	Number of respondents	Percentage
African drum	30	100%
Marimba	24	80%
Shaker	15	50%

4.5.2 The methods used to learn to play the African instrument

Memorisation method was claimed by 28 out of the 30 participants; that is about 93% of the sample. The statistics show that the pupils had not been formally taught to play the instruments that they claimed to have been able to play. If they had been taught using a formal method they should have been able to name the method. Even though the questionnaire had given the option to specify their method, none of them did that. It also reveals that all the respondents could play the drum – a percussion instrument that is played usually to provide rhythm and tempo to musical performances. The remainder of 2 subjects (7%) claimed that they had no African instrument they played other than the newly introduced *mbira*. The information justifies why some of the pupils could only keep tempo as they played as individuals. However, the glaring problem of losing tempo, especially in class performances, could be a hint to the fact that the pupils had not been involved in African ensemble performances.

4.5.3 Learning of the *nyunga nyunga mbira*

In the answers to the questionnaires 16 participants claimed that learning the instrument was easy. Thirteen of the sample expressed that it was very easy to learn to play the instrument. The two viewpoints make up 97%. Only one out of the 30 expressed that the instrument was difficult (constituting 3%). This distribution of figures is normal because the participants whose views fall at the extremes, of the instruments being difficult and very easy, do not comprise the majority of the sample. Even if the two are combined they still do not make a majority. From this standpoint it is clear that the majority of the participants found the instrument easy to learn regardless of the method that was used to teach them.

Figure 4.2   How easy or difficult is the playing of the *mbira* instrument
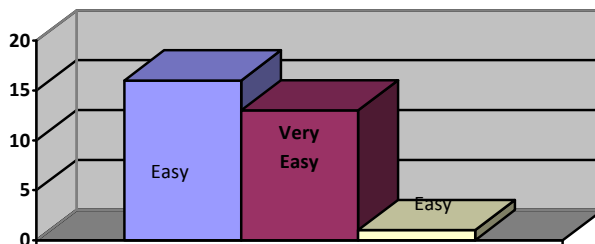
4.5.4   Preferences on methods of learning to play the *mbira* instrument

This question was meant to find whether subjects had special preferences on the methods to learn to play the *mbira* other than the methods used to teach them in this experiment. Whereas the indigenous method was opted for by 16 learners, the computer-assisted method was the choice of 14 participants. The figures translate to a majority of 53% who opted for the indigenous method whereas 47% chose the computer-assisted method of teaching. The information shows that the participants might have developed a liking for the method that was used to teach them the instrument. Therefore the difference of 6% is an insignificant factor in this case.

Figure 4.3   Preference on methods of learning the *nyunga nyunga mbira*
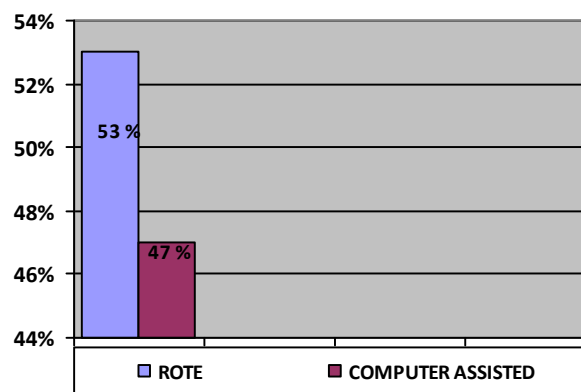
The difference between 47% and 53% is just two participants. It may mean that some of the pupils in either group may have liked to learn the instrument using a method of their choice between the two. If they had been given the chance to choose it would not have come as a surprise that the participants could have made their choices from the onset of the research. However, the pupils were not given a choice, to make sure the research findings are objective. The disparity between the two groups is only 6% and this is not a significant figure, as the majority of the children chose the method that they knew during the experimental research. It is also of fundamental importance to mention that participants from either of the two groups never got the chance to attend the other group's teaching sessions even after school, but at the end they all performed together and played in a concert of some sort.

4.5.5 Was the method easy or difficult?

The question solicited the learners' views on whether the method applied to their learning of *mbira* was easy or difficult. The following information was gathered in light of the above referred question. From the experimental group four participants viewed the method as difficult and two from the control group expressed the view that the indigenous method was difficult. The information on table 4.5 shows that 20% of the sample thought that the method applied to their learning of the instrument was difficult. The majority of 80% of the participants claimed that the method applied to their learning was effective and again this is not an abnormal situation. At least the majority of 80% found the methods used for their learning process in keeping with the objective to play the *nyunga nyunga mbira*. The findings in this question reveal that both methods were well taken by the pupils in their endeavour to learn to play the *mbira* instrument.

Table 4.5   How easy or difficult was the teaching method

Description	Rote method	Computer-assisted	Percentage
Easy	12	6	60%
Very easy	2	4	20%
Difficult	1	5	20%
Total	**15**	**15**	**100**

It was important to find out how much time the pupils spent on the instrument other than the time allocated in the class. Hence they were asked to state the time they practised with the instrument per week. About 20 participants expressed that they had spent one hour per week to practise *mbira* playing and the remainder of 10 spent 30 minutes. Considering that the research was conducted during the course of the final term of the year and that pupils were busy with other subjects the hour spent on practice was perhaps sufficient. The fact that the instrument which they were learning was not part of their school curriculum means that the 30 minutes that the ten students claimed to have dedicated for practice is a sign of commitment. This data reveals that the majority of the participants took the performance of the instrument seriously. The afternoon sessions were not always easy for the pupils to attend and yet some time was dedicated to learning the *mbira* instrument per week

4.5.6   Should the instrument be introduced in the school?

Figure 4.4   Inclusion of *nyunga nyunga mbira* in the curriculum

Yes=27   No=3
90%   10%
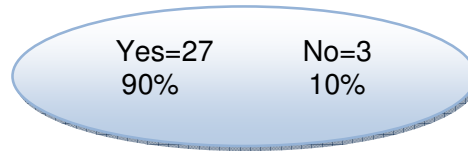
After the experiment the researcher wanted to know whether the pupils would have liked the instrument to be introduced in the school curriculum. The findings revealed that 27 participants out of 30, thus 90%, opted for the inclusion and three (just 10%) opposed the inclusion of the instrument in the school system. Whether the participants knew or not what they were implying, the overwhelming majority is a sign that the instrument would have been accepted by pupils if at all it was to be included in the learning programmes. Such a question could not have been asked before participants learnt to play the instrument because the opinions and reasons for both exclusion and inclusion could have been otherwise unjustifiable.

Related to the above question was the need to ask the learners to state the reasons why the *mbira* should be included or excluded from the school programme.

4.5.7   Reasons for inclusion and exclusion of the *nyunga nyunga mbira* in the school

The table below indicates that the majority of the reasons pointed toward the inclusion of the instrument in the school learning programme. Regardless of the method used to teach the instrument the majority of the participants felt that its inclusion would benefit them in many ways. The reasons (a) to (e) in table 4.6 below are an expression of personal feelings toward the instrument and all of them are strong enough to create motivation for the pupils to learn to play the instrument.

The view that the instrument was enjoyable constituted the highest response. The pupils liked the instrument even though it could have hurt their fingers. Thomas Fuller cited on http:www.brainyquote.com/quotes/quotes/t/thomasfulle125402.html says "All things are difficult before they are easy" in the beginning, regardless of the method used to teach the instrument was difficult. Notwithstanding the difficulties with time the majority of the learners were able to play and enjoy the instrument. However, there were some exceptions as observed in the two

reasons (f) and (g). Indeed the instrument can hurt the fingers especially if one does not use the proper technique. However the reasons raised by the participants to support the inclusion of *mbira* in the curriculum are overwhelmed by those in support of the exclusion of the instrument in the school. The findings show that the *nyunga nyunga mbira* was welcome in the school where the experimental research was conducted. The next question which was connected to the current question is presented on the next paragraphs.

Table 4.6   Reasons for inclusion and exclusion of the *mbira* in the school

Reason	Number of participants	
It is easy to learn	5	**YES**
It is our culture and history	4	
It is nice and enjoyable	14	**90%**
To learn theory of music	1	
So that many pupils can learn it	12	
It hurts fingers	3	**NO**
It is not part of our education	3	**10%**
Total	**30**	**100%**

4.5.8   If yes would you teach others to play the *mbira?*

Figure 4.5   If yes would you teach others to play *mbira*?

Yes = (24) 80%

No = (6)   20%
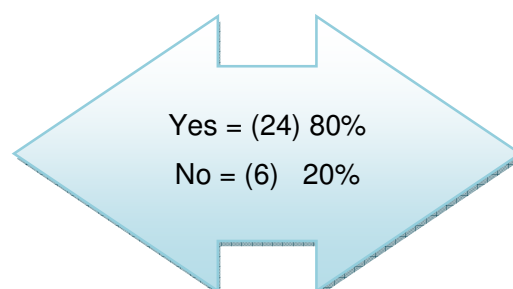
The above information shows that 20% of the sample was not willing to teach the instrument to other pupils. Even supposing that they felt that the instrument was enjoyable it is normal for certain individuals to avoid teaching the instrument. Some of the pupils might have been of the

opinion that teaching is reserved for the teachers while others do not find teaching enjoyable or otherwise it is an area of no interest. There is no clear evidence to suggest that some respondents would still have wanted to teach the *mbira* even though they were not in favour with its inclusion in the school curriculum. Notwithstanding the 20% that opposed the inclusion of *mbira* in schools, the majority (80%) of the pupils liked to teach others their newly acquired skill to play *nyunga nyunga mbira* music.

4.5.9   Preferred method of teaching

The participants were given room to suggest the method of their own choice for the teaching of the *nyunga nyunga mbira* and the following figures were extracted. The preferences for methods would have been determined by the approach used on the participants as they learnt to play the instrument. Nevertheless this reason should not be held as the rule of thumb because the participants did not choose their placement into the research groups. The memorisation method was chosen by 18 participants (60%) while 40% of the sample (which is 12) selected the computer-assisted method. Although this question was open-ended the participants did not come up with other methods. The response to this question suggests that as far as the *nyunga nyunga mbira* is concerned there was no other method that the learners had been exposed to. It also shows that it was the first time for all the subjects to play the *nyunga nyunga mbira,* thus making it the most ideal sample for the research.

The responses expressed as a ratio of rote- to computer-assisted method is 60 to 40, with a difference of 20%. In analysing this information one realises that preferences might have been based on two reasons: respondents were in one way expressing knowledge of the method that had proved effective when they were being taught. On another point they were also trying to choose a method that they presumed to be effective even if they had not been exposed to it. Prior to this research the objective of the whole study was not explained to participants because the researcher wanted it to be an objective enquiry through eliminating chances of working with pupils with preconceived ideas.

4.5.10   Personal feelings on the *nyunga nyunga mbira*

The information presented in table 4.7 shows that the majority of the participating learners felt good about being involved in the learning of the *nyunga nyunga mbira.* The statistics show that

only 6 learners were indifferent. The participants who were indifferent could have been among those that felt that the instrument was irrelevant and that it hurt their fingers (see Table 7 item (f) and (g) reasons for the exclusion of the *mbira* from the school curriculum).

Table 4.7   Personal view of the *nyunga nyunga mbira*

View	Responses	Percentage
Good	11	37
Very good	9	30
Excellent	4	13
Indifferent	6	20
Total	**30**	**100**

4.6   The computer-assisted method and the Arts and Culture learning area

During the research observations were made as the researcher interacted with learners and the teacher responsible for Arts and Culture at PCS. There are some issues that need to be discussed especially in the use of modern technology in the classroom. The lessons for the experimental group served in one way as theory lessons. The use of an overhead projector allowed all participants to see, hear and read music in a real life situation.

The computer-assisted sessions on the teaching of *nyunga nyunga mbira* served as a way to ground the pupils in theory of music. The music scores provided the learners with an opportunity to read music as stipulated in the Arts and Culture curriculum. Even though the theory of music was limited to the key of F major, the underlying principles of reading music on the treble staff are basically the same for all keys. The ability to read music in practical instruments is an empowerment that the learners could find applicable to certain other related areas of practical instruments. Even though the research was of a brief duration, the notation tunes for the Arts and Culture lessons can help preserve music that could otherwise be forgotten if teachers and pupils rely mostly on oral means to preserve the music of the people. The tune that was used at PCS will be remembered as it has been preserved in textual notation and audio. The school can actually use the audio, videos and notation to reinforce the skill to play the *nyunga nyunga mbira*.

The researcher left three *mbira* instruments at the school with the hope that they could continue with the performance of the instrument after the research is complete. The core areas of study in the learning area Arts and Culture fall into four areas: art, dance, drama and music. With the use of the *nyunga nyunga mbira* instrument it is possible to execute all four areas. *Mbira* music can be utilised to perform either contemporary or traditional African dances. The Pretoria Chinese School presents a rich place of diverse culture as observed during the research with children who came from the Chinese, Korean, Indian, several African countries among them Ghana, Ivory Coast and the entirety of Southern Africa. The Arts and Culture teacher can utilise these opportunities to enrich the pupils with the knowledge of diverse cultural practices as enshrined in the syllabus. It was important, however, to notice that the school involved the researcher in cultural and musical, drama and art aspects during the course of his activities there. During the research several Arts and Culture concepts were explored with the use of the *nyunga nyunga mbira*. Story telling was one of the aspects as where children listened with keenness to the stories involving wild animals, people, great places in the world and the famous stories of the Bible such as the birth of Jesus and the story of Christmas.

4.7 Summary

The presentation of data from the teaching and the practical sessions has been done through the use of tables, graphs, percentiles and descriptive statistics. The findings were collated under sub-topics addressing the key issues of the research on the effectiveness of the two approaches.

In this chapter the researcher presented the findings from the quasi-experimental research. It was found that both teaching methods used yielded positive results as the pupils from both groups were able to play the instruments reasonably well. The information from the findings shows that neither method was inherently better than the other. The data from the questionnaires shows that the instrument *nyunga nyunga mbira* was welcomed by the majority of the pupils. The majority of the respondents performed on the instrument with enthusiasm. The next chapter is therefore set to address matters pertaining to the findings, subsequent conclusions and recommendations of the study in the light of the *mbira* performance of the learners through the use of the African traditional and the computer-assisted method.

CHAPTER 5

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1   Introduction

This chapter is mainly concerned with presenting a summary of the research on the teaching of the *nyunga nyunga mbira*. The previous chapter sought to analyse and discuss the data from the research. In this chapter I discuss the findings and draw conclusions from the gathered information. I also make recommendations based on the findings. The findings will be deliberated in light of the research problem which sought to find the effect of using computer-assisted instruction to teach the *nyunga nyunga mbira.* Furthermore the findings will also include the comparison of the two methods used to teach the instrument and see which one yielded better results. In the original proposal for this research the researcher had made a hypothesis that the computer-assisted instruction would be more effective to teach the *nyunga nyunga mbira* than the traditional approach. As a result the findings on the comparison of the two are presented to give an answer to the hypothesis. The conclusions and recommendations are therefore made in order to do further research in didactics of indigenous African music instruments, and particularly the *mbira*.

5.2   Findings

The indigenous traditional method proved to be an effective method of instruction as it yielded satisfactory results in the children's performance of the *nyunga nyunga mbira.* The method is cost effective as the instructor does not necessarily need a lot of resources other than the skill to play and instruct the instrument. The method can be presented in a relaxed manner as there are no formal procedures for conducting the teaching sessions. Although this method is usually conducted in the traditional language it can be used in any language and at PCS the use of English proved effective.

The traditional indigenous method was more popular among the learners, the majority of whom indicated that they preferred the method in both the teaching and learning of the instrument. The proceedings in the control group were done from the beginning to the end with no breaks and the pupils liked this. The method allows the learners to get immediate feedback on the acquired skills and thereby provides them with reinforcement on concept formation.

The African traditional method is, however, problematic in that it can deprive the learners of the opportunity to read, hear and manipulate things for concept formation to take place. Some learners needed to work with music written on a score and they struggled to learn by rote. There are no guaranteed results with this method because there are no formal guidelines as the method relies on oral skills. Although the method yielded commendable results in formal learning, teachers need to put in place a programme that caters for all the learners.

The computer-assisted approach was also successful in that it yielded good results. The majority of pupils in the experimental group were able to play the *nyunga nyunga mbira*. The method allowed learners to read, hear and manipulate in learning the instrument. It also created opportunities to promote concept formation. Pupils learnt by both association and guided discovery. The teacher's involvement was reduced to that of a supervisor once the pupils had grasped the fundamentals of the method. It also catered for the learners who had prior knowledge of reading staff notation. The method helps the learners to understand the tuning of the *nyunga nyunga mbira* from the onset of the teaching, especially through the use of the Sibelius notation software package which allows one to notate the *mbira* tunes. The pupils can actually play the reference tuning in Sibelius and identify the keys that may need tuning by matching the key number with the pitch of the key. Nevertheless the pupils in the control group did not suffer any specific setbacks in comparison to the experimental group as the research was not focusing on the tuning of the instrument.

The computer-assisted method presented opportunities for students to utilize the reading of staff notation in music while performing at the same time. The method also was useful to the learners who had already been exposed to classical music training in piano tuition. The PCS experimental group consisted of five learners who had had piano tuition since the age of nine, and consequently they did well in playing the *nyunga nyunga mbira*. Although there were other learners who played the *nyunga nyunga mbira* well, there appeared to be no direct link between their performance and their knowledge of their western music instruments.

Of the 15 learners under the computer-assisted method only 14 learners specifically indicated their liking of the method. The reason for this could have been that the one remaining learner did not like the process that he/she went through during the sessions. Notwithstanding the learners' choices in both groups the difference of one learner who liked the traditional method instead of the computer-assisted method, being the only case for the experimental is insignificant. All the learners in each group liked the method that was used to

teach the *nyunga nyunga mbira* meaning that they found both methods very useful to learn the instrument. The computer-assisted approach was time consuming in that the teacher had to set up a number of gadgets and the learner might have preferred a method that involved the use of fewer devices.

The computer-assisted method needed clear instructions to guide the learners through the learning process. It was observed that each time a new concept was introduced the group requested more time to reinforce the pertinent skills. The pupils found it difficult to play while looking at the flow of the score in Sibelius and thus the skills acquisition took time. The teacher is always moving around to make sure that learners are on the right track. The other problem with the method is that for some learners it was not possible to play without seeing the score on the screen and then over-reliance on the equipment made their performance mechanical.

In a comparison of the two above-mentioned methods one finds that neither placed learners at a specific advantage over the other. All the learners were able to play to a standard that made it difficult to find which method had the best throughput. The assessment that was done at the end of the research for each group indicated that the pupils in the experimental group were consistent from the beginning to the end. The control group did very well from the outset and yet they could not maintain the momentum of their good performance. The experimental group instead was lagging behind for more than six weeks but after the seventh week they moved on considerably, closed the gap and managed to catch up with their peers in the control group. At the end of the experiment the statistics showed that the experimental group was on the brink of doing better than their peers. This seems to indicate that the method used with them needs ample time.

The researcher was experimenting with the traditional and computer-assisted methods for the first time in a formal setting, and found that the latter needs thorough preparation. With the computer-assisted approach the learning experiences should be organized in a way that allows guided discovery learning to take place. The traditional method appears to depend largely on the instructor's personal style, and the availability of the music instruments becomes the most crucial success factor.

The control group which received tuition through the traditional method seemed to be doing better than their peers, until the seventh week, after which they suddenly began to perform better than the previous weeks. Both groups were introduced to a new number system and this saw a big change for the experimental group. Concerning the traditional method learners

were not affected by the change of the number system. It is difficult to associate the improved performance with the change of number system because it did not affect the control group. However, as the researcher was involved as the instructor with the pupils, the reduced use of numbers meant that the experimental group had fewer aspects to handle at the same time. This eased the burden to some extent of reading and playing the instruments simultaneously.

From the findings the learners under the computer-assisted method began to gather observable momentum from lesson 7 onwards and they then did better than the control group in the final Kukayiwa section1-4. Both methods served their intended purpose for the research well and all learners in the groups managed to ultimately perform the *nyunga nyunga mbira* together in a concert. There were no remarkable differences in performances of either group and, in fact, they played together as one big group and it was not easy to tell whether the pupils had been taught through different methods.

The learners from both groups shared some similar sentiments as they complained of the instrument hurting their fingers. The problem of increasing speed as they moved on and not maintaining a steady beat throughout was a common trait with both groups, although the experimental group improved with time, especially as the Sibelius software always gave them the tempo for their performance.

Although the research was a comparison of the traditional and computer-assisted methods in teaching the *nyunga nyunga mbira,* it was also interesting to note how the instrument can be taught to people of different cultures. The PCS cultural composition of the classes was so diverse that Korean, Chinese, Afrikaans, English, west, east, north and southern African learners could be shown to play the *nyunga nyunga mbira* together successfully. The research enabled the learners to come together and interact closely with other learners from different ethnic backgrounds in the Arts and Culture learning area. Other classes not involved in the research complained of being left out of these experimental classes, especially the grade fives and below. As a result the Arts and Culture teacher requested the researcher to share his experience with the learners in grades one to five. The findings of this additional endeavour are discussed in the next paragraph.

Since the learning area Arts and Culture revolves around the core areas of music, art, drama and dance, it is easy to connect different aspects of culture. The researcher told stories accompanied with *mbira* music to the pupils. In some of the stories children were asked to participate through singing along, creating their own stories and also drawing some of the

situations portrayed in the stories. The younger grades were asked to create movement patterns ideal to the situations in the different stories. The researcher played the *nyunga nyunga mbira* as he recited the stories, making use of the *mbira* music, as an Arts and Culture teacher, to teach the core aspects of the learning area. It was found to be practically possible to teach a core concept in Arts and Culture and integrate it with other core areas in one session without prejudicing the objectives of the lesson for that day. Story telling is part of many cultures while singing is a human activity attached to a variety of issues pertaining to life. Music and dance in many musical cultures are inseparable and at times dance is referred to as music and vice versa, especially in the African culture. Unconditionally art permeates through human living with drama, music, movement and dance becoming a subset of the world of art (Wolf 2005).

5.3   Conclusions

From the findings in this research it can be concluded that the traditional method of instruction is practically applicable to the formal teaching of the *nyunga nyunga mbira*. The traditional method was proven to be easy and it does not require a lot of resources for implementation. The traditional method can be used with people of any ethnic background as long as a common language for the learners and the instructor is used as the medium of instruction. This approach also takes less time than with enhancing technological aids to develop skills to play the *nyunga nyunga mbira* with first time learners and it does not require special settings like a laboratory. It can thus be concluded that the computer-assisted method is not in any way superior to the traditional method. The computer-assisted approach does, however, present the learners with a strong foundation to understanding the theory of music.

Learners who had knowledge of western theory of music in both the control and experimental groups performed better than their peers. Those placed in the experimental group found it easy to read the notation for the *nyunga nyunga mbira* tunes and also to keep to the regular tempo of the music.

As the tunes in the computer-assisted method were presented as both audio and printed notation, learners in the experimental group showed a strong grasp of the skills required to perform the *nyunga nyunga mbira*. The results could have been different if more time had been allocated to the experimental research. The pupils in the experimental group might have been able to perform more tunes than the control group.

The researcher concludes that in spite of the diverse cultural background of the participants in this research, the *nyunga nyunga mbira* was very welcome at the school where the research was conducted. The traditional method was, however, the most favoured method of instruction among the learners.

There is a strong correlation between the performance of *nyunga nyunga mbira* music and the core areas of the learning area Arts and Culture. With the use of the instruments there is a culmination of different African cultures in art, dance, drama and music, all of which were witnessed during the research.

In view of the hypothesis which is thus, "The availability of notation software packages can be used to offer tuition to first time learners of African indigenous instruments and in particular the *nyunga nyunga mbira*. Hence a combination of modern technology software and staff notation can result in a better understanding of how to play the *nyunga nyunga mbira* instrument instead of the African indigenous method", it was found that the use of modern technology was effective with the experimental but did not give the learners an added advantage over their peers in the control group. Therefore the method was not found to be better than the traditional approach in this research.

5.4   Recommendations

It is essential that the instrument be given a trial period of implementation in schools as a pilot project, to find how it will fare over a longer period of time than only two months of research as were given to it at PCS. A well tuned *mbira* instrument is durable enough to last more than two years before it requires major retuning. Schools with few resources can buy the instrument as it is reasonably priced. It can also be used in afternoon sessions and if resources are available a specialist can be invited who can take pupils and teach them to play the *nyunga nyunga mbira*.

The Arts and Culture learning area presents an opportunity for schools to choose the kind of traditional African or other instruments to teach. It is recommended that Arts and Culture teachers be empowered through well-designed programmes so that they can teach all the core aspects of the learning area. The drum, marimba and shakers are some of the traditional African instruments, which could be taught through the use of modern technology.

The relatively strong South African economy presents opportunities for schools to implement viable arts and culture programmmes and some of them have highly supportive school governing bodies in place. The private schools present a more lucrative scenario than do state-aided schools to develop skills in performing indigenous African instruments. It is recommended that such advantages should be maximally utilized, to the benefit of all learners.

It is important that the particular type of research engaged in for this project be given more time and include more schools, to further explore the proposed computer-assisted method in the teaching of the traditional African instruments, and especially the *nyunga nyunga mbira.* Such research can be done through a pilot project at a number of schools, in order to ascertain the impact of the two methods over a more extended period.

5.5   Summary

The research was focused on ascertaining the effectiveness of the computer-assisted method in comparison to the indigenous traditional method. The two methods were found not clearly to give the learners in either group an added advantage. The ultimate result was that both methods yielded very much the same results. The pupils in both groups played the Kukayiwa tune together as if they had been taught under the same conditions from the beginning.

It is possible to use modern technology in teaching indigenous African musical instruments, particularly the *nyunga nyunga mbira,* and the method enabled the learners to retain the fundamental concepts of the performance of the instrument through the computer-assisted approach. With some of the enthusiastic pupils who got involved in the research continuing at the PCS in grade 7, plans can be made to set up a *mbira* ensemble. The enthusiastic pupils can actually be used to create a nucleus and gradually expand the performance of *the nyunga nyunga mbira* to other grades. The Arts and Culture teacher can make use of the instruments and the tunes that were given to the school to explore the performance of the instrument.

The fact that both methods proved to be viable during the research gives the school an advantage to choose a method with which to teach *nyunga nyunga mbira.* The performance of the above-referred instrument can be taught if the school engages a resource person to help with developing performance skills among the new and old learners of the instrument. The traditional method poses a problem to teachers if there are no documented procedures

to follow when one is teaching. The Arts and Culture teacher with support from the school administration can take the opportunity to understudy the resource person for the traditional instrument until they have the basic pedagogy for the instrument. Armed with the knowledge gathered the teacher can teach using either modern technology or the traditional approach. This research shows that learners are capable of performing any instrument if the teaching method is implemented properly.

The slow uptake of indigenous musical instruments could be attributed to the lack of standardization of approach and that some of the music for the instruments is neither notated nor recorded for reference. The research results on the effectiveness of the methods in teaching the *nyunga nyunga mbira* present a line of conformity for the teachers to follow in dealing with traditional African instruments. A school like PCS can set up a traditional performance *mbira* ensemble because they have information on how to teach the *nyunga nyunga mbira*. The school has the *nyunga nyunga mbira* tunes in both audio and print format music. The video and audio recordings can be useful to study some techniques on the teaching of the *nyunga nyunga mbira.*

A workshop to deliberate on the didactical issues on the *nyunga nyunga mbira* could pave way for a pilot project in schools interested in the instrument. It is therefore possible to start and run a pilot *nyunga nyunga mbira* performance project at either school or cluster level and involve at least grade 6 learners. The pilot project should however not be restricted to grade 6 learners because the instrument can be taught at any level. All that is needed is to keep the tunes simple especially tunes like Kukayiwa 1 and 2 which require the use of thumbs only.

SOURCES

Alasuutari, P. 1995. *Research culture: Qualitative method and cultural studies.* Thousand Oaks: Sage Publications.

Auer, L. 1980. *Violin playing the way I teach it.* New York: Dover Publications.

Bachman, M. 1991. Dalcroze today: An education through and into music. Oxford: Oxford University Press.

Bastien, J.W. 1977. *How to teach piano successfully.* 2nd edition. Park Ridge: General words and music publishers.

BrainyQuote. Online Thomas Fuller 1732 quotes. Available online at http://www.brainyquote.com/quotes/quotes/t/thomasfull125402.html [Accessed 2010/12/20]

Bruner, J. S. 1961. *The act of discovery.* London: Harvard University Press.

Byzantine, J. 2002. *Guitar technique rationalized.* New York: Chanterelle Melbay.

Child care and early education. Experiments and quasi-experiments. Available at http://www.researchconnections.org/childcare/datamethods/experimentsquasi.js [Accessed 2010/12/16]

Chilisa, B. and Preece, J. 2005. *African perspectives on adult learning: Research methods for adult educators in Africa.* Cape Town: UNESCO.

Choksy, L. 1991. *The Kodály Context: Creating an Environment for Musical Learning.* New Jersey: Prentice Hall.

Choksy, L., Abrahamson, R.M., Gillespie, A.E., Woods, D. and York, F. 2001. *Teaching Music in the Twenty-first Century.* New Jersey: Prentice Hall.

Cohen, L. and Manion, L. 1980. *Research methods in education.* London: Croom Helm.

Davis, F.D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly.* Vol. 13(3) pp 319-340.

Department of Education 2003a. National curriculum statement assessment guidelines for general education and training (Intermediate and senior phases) Arts and Culture. Pretoria: Department of Education.

Department of Education 2003b. Revised national curriculum statement grades R-9 (Schools). Teachers' guide for the department of learning programmes. Arts and Culture. Pretoria: Department of Education.

Desmond, P. 2002. ICT in the secondary music curriculum. *Aspects of teaching secondary music: Perspectives on practice.* Edited by Gary Spruce. Pp 155-172. London: Routledge-Palmer.

Fernandez, E. 2001. *Techniques, mechanism learning: An investigation into becoming a guitarist.* Columbus: Melbay Publishers.

Gieseking, W. and Leimer, K. 1972. *Piano technique.* New York: Dover Publications.

Glise, A. 1977. *Classical guitar pedagogy.* London: Bay Publications.

Herfurth, C.P. and Urwin, S.G. 1971. *Tune a day classical guitar.* London: Chappell and Company.

Hodges, R. 2001. Using ICT in Music Teaching. *Issues in Music Teaching.* Edited by Chris Philpott and Charles Plummeridge. Pp170-181. London: Routledge-Palmer.

Hofstee, E. 2009. *Constructing a good dissertation: a practical guide to finishing a master's, MBA or PhD on schedule.* Sandton: EPE.

Sociology index. Quasi-experiment. N.D. Available at http://sociologyindex.com/quasi_experiment.htm [Accessed 2010/12/14]

Huber, M.D. and Runstein, R.E. 2005. Modern recording techniques. 6th edition. Boston: Focal Press.

Kotchevitsky, G. 1982. *The art of piano playing: A scientific approach.* London: Oxford University Press.

Kuture, T. 2002. Music workshop at Africa University in Zimbabwe: The teaching of the *nyunga nyunga mbira*. Mutare: Africa University.

Last, J. 1980. *Freedom in piano technique.* London: Oxford University Press.

Leedy, P.D. and Ormrod, J.E. 1985. *Practical research planning and designing*. Upper Saddle River: Merrill Prentice Hall.

Maraire, D.A. 1991. *The Nyunga nyunga mbira: Lesson Book One.* Portland: Swing Trade.

Masin, R. and Kelemen, M. 1982. *Violin teaching the natural way.* Netherlands: Knuf Buren Publishers.

Matiure, P. 2008. Learning how to play karimba/nyunganyunga the easy way for beginners. *Talking drum*. No. 30 December pp 15-20.

Matiure, P. 2009. Learning how to play karimba/nyunganyunga the easy way for beginners. *Talking drum*. No. 31 July pp 2-6.

Matiure, P. 2010. Personal interview. Place: Midlands State University Gweru.

McNiff, J. 2002. *Action research for professional development: concise advice for new action researchers*. Available online www.jeanmcniff.com/arbooklet.asp [Accessed 2010/12/13]

Mouton, J. 20091. *How to Succeed in your Master's and Doctoral Studies: A South African Guide and Resource Book*. Pretoria: Van Schaik.

Muranda, R. 2010. The nhare music trends in Zimbabwe since 1980. *Journal of music research in Africa.* Vol. 7 (1) pp 76-87.

Obrien, R. 1998. An overview of the methodological approach to action research. Theory and practice of action research. Available at http://www.web.net/~robrien/papers/arfinal.html#_Toc26184651 [Accessed 2010/12/12]

Pace, R. 1971. *Piano for classroom music.* 2nd edition. New Jersey: Prentice Hall.

Philipp, L.H. 1982. *Piano technique, tone, touch, phrasing and dynamics.* New York: Dover Publications.

Robson, C. 1998. *Real World research: A resource for social scientists and practitioner-researchers.* Oxford: Blackwell Publishers.

Rudolph, T.E. 1996. *Teaching music with technology.* Chicago: GIA Publishing.

Stowell, R 1985. *The Cambridge companion to the violin: The technique and performance practice.* London. Cambridge: University Press.

Tracey, A. 1972. The original African mbira? *African Music.* 5:2 pp 85-104.

Urshalmi, J. 2006. *A conscious approach to guitar teaching.* London: Chanterelle Melbay.

Vermeulen, D. 2009. Implementing music in an integrated arts curriculum for South African primary schools. Unpublished DMus Thesis. University of Pretoria.

Wikipedia, the free online encyclopedia 2010 Eurhythmics. Available at http://en.wikipedia.org/wiki/Eurhythmics [Accessed: 2010/09/19]

Wikipedia, the free online encyclopedia 2010 Kodály method. Available at http://en.wikipedia.org/wiki/Kod%C3A1ly_Method#Pedagogy [Accessed: 2010/09/19]

Wikipedia, the free online encyclopedia 2010. Dumisani Maraire. Available at: http://en.wikipedia.org/wiki/Dumisani_Maraire [Accessed: 2010/05/21]

Wikipedia, the free online encyclopedia 2010.http://en.wikipedia.org/wiki/Action_research [Accessed 2010/12/13]

Wolf, E. 2005. Camphill Beaver run: Spiritual essence and art from communities. *Journal of co-operative living.* No.126. Available at http://www.camphill.org/?p=160 [Accessed on 2010/12/22]

Yampolsky, I.M. 1967. *Principles of violin fingering*. Oxford: Oxford University Press.

Appendix I

QUESTIONNAIRE FOR THE LEARNERS

Please answer all the questions in this questionnaire. Your responses will be treated with confidentiality and respect. The information will be used for this research only.
 NB: do not write your name on this questionnaire.

Tick one of the following as your answer. (√)

1. Age of student

11	12	13	14

2. Gender

Male	Female

3. How many traditional African instruments do you play?

----

4. If you play, which method did you use to learn to play the African instrument?

A	African indigenous memorization
B	Staff notation
C	Tablature
D	Other - specify

5. The *nyunga nyunga mbira* was

A Very difficult	B Very easy	C Difficult	D Easy

6. The method for the *nyunganyunga mbira* instrument was

A Very difficult	B Very easy	C Difficult	D Easy

Fill in the blank space

7. How long did you do your practice on the *nyunga nyunga mbira* per week?

----

8. Should the *nyunga nyunga mbira* be introduced in schools in South Africa?

A Yes	B No

9. If yes, why should it be introduced?

----

10. If not, why should it not be introduced?

----

11. Given a chance to teach *nyunga nyunga mbira,* would you teach your classmates/friends?

A Yes	B No

12. If yes, suggest a method that you would use to teach them.

----

13. What are your thoughts about *nyunga nyunga mbira* after this short practical course?

A Good	B Very good	C Excellent	D Indifferent

Appendix II

FACULTY OF HUMANITIES
DEPARTMENT of MUSIC

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

TEL (012) 420-3747 (*Secretary*)
FAX (012) 420-2248

PRETORIA, 0002, SOUTH AFRICA

22 October 2010

The Principal

Pretoria Chinese School

Dear Sir

I am currently busy with my master's degree at the University of Pretoria under the supervision of Prof Caroline van Niekerk. My research relates to a comparison of the software based staff notation and the indigenous memorization methods in teaching the *nyunga nyunga mbira* to grade 6 Arts and Culture learners.

I would like to request permission to do this research project at your school involving at least two grade 6 classes. The two grade 6 classes will be taught how to play the *nyunga nyunga mbira* using one of the two selected methods as an experiment to find which method is more effective. I would like to take pictures and videos of learners during the research proceedings and these will be used for further research. After the experiments the learners should answer a questionnaire to appraise the methods. The set questions will not be of a personal nature and will not embarrass anyone. There will be no risks or discomforts involved, nor any monetary incentives offered to participate. All information gathered will be treated with confidentiality and anonymity is guaranteed. The learners may withdraw from the research at any time.

Thank you.

Yours faithfully,

Muranda Richard

_____

I _GAVIN BUDD_ _____ agree that grade six learners may take part in the research as outlined in the above letter. I understand all that it implies.
Signed_____ Date __23 / 10 / 2010__

A-iii

FACULTY OF HUMANITIES

DEPARTMENT of MUSIC

TEL (012) 420-3747 (*Secretary*)

FAX (012) 420-2248

PRETORIA, 0002, SOUTH AFRICA

22 October 2010

Dear Parent

I am currently busy with my master's degree at the University of Pretoria under the supervision of Prof Caroline van Niekerk. My research relates to a comparison of the software based staff notation and the indigenous memorization methods in teaching the *nyunga nyunga mbira* to grade six Arts and Culture students.

I would like to request permission to do this research project with your daughter/son at Pretoria Chinese School. He/she will, together with other learners, be taught how to play the *nyunga nyunga mbira* using one of the two selected methods as an experiment to find which method is more effective. I would like to take pictures and videos of pupils during the research proceedings. After the experiments they will answer a questionnaire to appraise the methods. The set questions will not be of a personal nature and will not embarrass them. There will be no risks or discomforts involved, nor any monetary incentives offered to participate. All information gathered will be treated with confidentiality and anonymity is guaranteed. The learners may withdraw from the research at any time.

Thank you.

Yours faithfully,

I_____ agree that my daughter/son take part in the research as outlined in the above letter. I understand all that it implies.

Signed_____ Date _____

Appendix IV

FACULTY OF HUMANITIES
DEPARTMENT of MUSIC

TEL (012) 420-3747 (*Secretary*)
FAX (012) 420-2248

PRETORIA, 0002, SOUTH AFRICA

22 October 2010

Dear Learner

I am currently busy with my master's degree at the University of Pretoria under the supervision of Prof Caroline van Niekerk. My research relates to a comparison of the software based staff notation and the indigenous memorization methods in teaching the *nyunga nyunga mbira* to grade six Arts and Culture students.

I would like to request permission for your participation in this research project at Pretoria Chinese School. You will together with other grade six learners be taught how to play the *nyunga nyunga mbira* using one of the two selected methods as an experiment to find which method is more effective. I would like to take pictures and videos during the research proceedings. After the experiments I will kindly request you to fill in a questionnaire as an evaluation of the teaching methods used. The set questions will not be of a personal nature and will not embarrass you. There will be no risks or discomforts involved, nor any monetary incentives offered to participate. All information gathered will be treated with confidentiality and anonymity is guaranteed. You may withdraw from the research at any time.

Thank you.

Yours faithfully,

I_____ agree to take part in the research as outlined in the above letter. I understand all that it implies.

Signed_____ Date _____

Appendix V

CONTROL GROUP LESSON

CONTROL GROUP LEARNERS IN SMALL GROUPS

A-vii

EXPERIMENTAL GROUP IN LESSON

EXPERIMENTAL GROUP LEARNERS IN SMALL GROUPS