# CHAPTER 6

# TECHNOLOGICAL ADVANCES AND EXPERIMENTALISM IN MUSIC EDUCATION IN SOUTH AFRICA

## 6.1 INTRODUCTION

It is generally accepted that technology has become an important factor in the arts. Music is no exception. The term Music Technology is widely used, but its definition is not clear to the majority of people. It has to do with the use of machinery and the programmes that enable, activate or drive the machinery, whilst music has to do with aspects of organised sound. Thus, whilst the application of the term Music Technology is hardly new, present day applications are complex.

The age of technology and computers is now gaining momentum in the field of education and music in particular. The 21st century is a technological era and the world's survival seems to rely on computers. In first world countries like Australia, technological equipment such as synthesizers, laser videodiscs and camcorders is used from primary school onwards. McPherson (1995: 12) asserts that the major benefit offered by computer technology is to unearth the potential for disadvantaged students in the isolated areas of Australia. This could also be the case in the rural areas of South Africa, but unfortunately the finance is not available, given the magnitude of other problems. Because of new world order, and the advent of technology, Music Education in South Africa requires restructuring in order to address curriculum needs prevailing in the South African education system, using technology.

## 6.2 THE NEW TECHNOLOGY AND CURRICULUM DESIGN

This section deals with the relevance of technological equipment in the design and development of Music Education curriculum. This is to indicate that technology has a role to play in teaching and learning of subjects. The complexities of institutional curriculum design are most rationally resolved through the use of tabular presentations often generated through software packages. Parallel thematic tracks

are defined over an educational course period, usually measured in months or years (Bray 1974: 4). Although technology is vital to the teaching of subjects in the modern day schools and institutions of higher learning, note should be taken of those schools and institutions without electricity. Software can be used to facilitate teaching and at the same time be used as an educator. There is, however, little effort to consider in what way the curriculum framework reflects the universe of knowledge, the possibilities of navigating it fruitfully, or any sense of its integration or integrity as a whole. Education is a process of tunnelling through knowledge space and has little to do with understanding the dimensions of knowledge space.

## 6.3 THE AVANT GARDE

Looking at life around us one finds phenomena that would have been unthinkable three or four generations ago. A release from and break with tradition is typical of all facets of modern life. This is no less true of the arts: in painting, the use of perspective has gone by the board and in its place a conglomeration of lines and planes is substituted, labelled according to the meaning the artist wishes to attach to it, from Surrealism to so-called 'pop-art'; in sculpture, work is produced which to the layman, rooted as he is in the traditional, appears weird, unnatural and even unacceptable; literature and the theatre have contributed like phenomena, from 'new matter-of-factness' to the absurd; the social sphere is beset with 'hippie' demonstrations, 'happenings' and a permissiveness which presents a new moral code (Whittall 1977: 182). This revolt against the past with its rules and formulas has also found its manifestations in music. This is a perfectly logical occurrence, for the different arts have always passed through similar phases of development or have been mutually influenced in the expression of such phases.

A study of the avant-garde implies a study of that music which stands in the vanguard of musical developments. The term is used in this research study to denote that music which searches out towards the new in this present day and age, music which in the last twenty to thirty years has been the product of the thoughts of many leading contemporary composers. Whittall distinguishes between the terms, avant-garde and experimental, claiming different concepts for them. He says:

> Convenient categorisation of the mass of composers, from Satie to Stockhausen, who are neither consistent upholders of the traditional tonal forms nor totally committed to the twelve-note technique, is virtually impossible. Basic distinctions can still be made between stylistic features and techniques, but in most cases it is the confrontation between different, if not opposing, tendencies which has produced memorable music: increasingly, to be a radical is to be an eclectic. The distinction which has been suggested between "avant-garde" and "experimental" music is an attempt to clarify the confusion, even at the risk of oversimplification: "avant-garde" composers are those who continue to build on the traditional foundations of European Music, however remote their actual techniques may be from those of the best-known classical and romantic representatives of that tradition, whereas "experimental" composers have rejected that tradition, however hard they may occasionally seem to find it to avoid the parody and distortion of what they have determined to put behind them. In these terms, all those composers so far discussed who are not obviously conservative are closer to the avant-garde camp than to the experimental, and many of those who remain to be discussed may be considered as experimental in intent but avant-garde in practice. It is at least already fairly easy to distinguish between those whose experimentalism is wholehearted and those who are prepared to compromise with (potentially "conservative") avantgardisms (Whittall 1977: 195).

Whatever the arguments put forward regarding terminology may be, two guidelines are used for this research study:

- the music of the last 50 to 60 years
- the new racial aesthetics that have prevailed during the second half of the 20th century.

Trevor Bray, discussing the music of today, points out that:

> Because the new sounds produced by the avant-garde are more recognisable for their individuality as such, this means that they are less easily acceptable to those who have always listened to music using traditional forces (Bray 1974: 9).

He stresses that there are many problems associated with coming to grips with the music, a few of which are:

- its apparent (and in quite a few cases thoroughgoing) complexity

- the musical tastes catered for by the concert halls, music publishers, radio and television, etc., are more often than not conservative
- avant-garde composers are not entirely innocent of not discouraging complexity
- the listener has to come to terms with the fact that these composers are writing in a new idiom
- not only has each composer's style to be made familiar but so has every composition.

Dieter Schnebel's comment on Stockhausen, quoted by Bray (1974: 11), is most relevant:

> Thus not only the Kontra-Punkte (this piece was completed in 1953 and is Stockhausen's first work of importance) but all his other works, too, are "Op. 1". With each of these works it is as if Stockhausen had only then begun to compose. Each work is a new effort to formulate the historical moment. Consequently, to try to understand a particular work one is not in the least obliged to know its predecessors.

## 6.4 TECHNOLOGY AND SYNTHETICISM

The music of the avant-garde, be it experimental or synthetic, is relatively unknown to the general public in South Africa, contends Cage (1961: 5). Only in recent years has contemporary Art Music, and more particularly avant-garde, become better known through the medium of recordings. Some composers still attach much importance to the concert hall, however, preferring their works to be transmitted directly to the listener rather than by recordings or the radio. The reason for this is that the methods employed by composers of synthetic music require loudspeakers (sometimes as many as 150) to be placed at various remote corners in the concert hall and only those actually present would experience the full effect of sounds reaching them from all angles. Also, where live performers are employed, with or without synthetic means, the composer prefers an audience in the concert hall. Cage goes further to say that even live performers are frequently placed in unusual positions, and the composer maintains that only in a concert hall could the listener

derive the full benefit from a performance, recordings being inadequate for transmitting the true effect. This type of music is known as spatial music.

Since most modern avant-garde music is an incontrovertible fact, since it is relatively unknown and since it must inevitably leave its mark on the music of the future, it is necessary to examine it closely. There is, in fact, according to (Brindle 1975: 57), so much enthusiasm for synthetic music in other parts of the world that specially equipped sound studios in America, Germany, France, Italy, Britain and even Japan are providing active stimulus. Three studios in particular, those at Columbia University, Cologne and Darmstadt have already become world famous. Special festivals are held annually, those at Donaueschingen and Darmstadt attracting much attention (Brindle 1975: 41).

On hearing experimental music the listener cannot help but wonder whether the composer is not perhaps poking fun and whether the so-called avant-garde music which is hailed so earnestly as 'great art' is not merely a fad, or a joke at the expense of the gullible. John Cage, one of the best known of American avant-garde composers, has gone so far as to admit that some of his lectures and writings which have been written according to a technique similar to that of his music, are nothing more than 'leg-pulls'. On reading such 'leg pulls' one is indeed tempted to judge his musical compositions by the same standards.

Up till 1957 Cage was violently opposed to his music being called 'experimental', but today he no longer objects to the term. Indeed he actually describes the music of other composers thus, in the sense that he as a listener is making an experiment. In his book, *Silence - Lecturers and Writings*, he states that the term 'experimental' has been rejected by some in favour of 'controversial', while others go even further by asking whether present-day music is still 'music' at all in the true sense of the word (Cage 1961: 6).

The general trend of experimental music may be summarised shortly in Cage's own words:

> For in this new music nothing takes place but sounds: those that are notated and those that are not. Those that are not notated appear in the written music as silences, opening the doors of the music to the sounds that happen to be in the environment. This openness exists in the fields of modern sculpture and architecture (Cage 1961: 7-8).

As early as 1937 Cage believed that the use of noise in music would continue, and even increase to the end that all possible sounds be made available for the production of synthetic music. His prophecy has come true in that electronic music, one of the by-products of experimental music, has made possible such new sounds, shades of pitches, new tone colours and effects as have never before been experienced by the human ear. The advent of electronic music has opened many other channels, such as the complete equalisation in aesthetic terms of all working material (for example, duration of a tone, and volume, which could at any time be equal in importance to a definite pitch). Electronic music has also extended the whole range of aural perception.

In an article 'Music and Change: The Music of the New Millennium' Ehle comments that:

> It appears that, that musical entity recognisable collectively as the atonal, expressionistic, experimental, intellectual avant-garde has run its course and exhausted itself. It is not that the composers working in this idiom are incapable of inventing variations on their basic principles; they are. But they have come to a point at which a variation on an old theme, whether it be a further mathematicization of music or a new experiment in unintentional music, inevitably produces the same aural effect as some other compositional event that is already a part of musical history. In effect, despite some small changes in specific technique, the language of the avant-garde has now been exhausted. What they had to say, socially, by their new, radical style has now been said. There is little need and less interest in having the message of this music repeated in further minute variations. When such a thing happens, a musical style dies, although specific practitioners (such as Boulez and Babbitt) may go on for another quarter-century producing ever more complex and inscrutable monuments to erudition (Ehle 1984: 288).

## 6.5 DEVELOPMENT OF ELECTRONIC INSTRUMENTS, DEVICES AND TECHNIQUES

Generally, electronic music may be described as music in which the sound is produced and/or modified entirely through electrical means, and is played over loudspeakers. An important thought to keep in mind is that electronic music is not the same as traditional music that is played with an electronic instrument (i.e. electronic organ or electric guitar), and that it also does not refer to music played through an electronic medium such as a phonograph or radio.

### 6.5.1 Early developments

Thaddeus Cahill (1867-1934) registered his invention, the Telharmonium, in 1897 and first demonstrated the machine publicly in 1906. Also called a Dynamophone, this dinosaur of electronic music was over 16 metres long and weighed approximately 200 tons (Morgan 1991: 1).

> Cahill saw in his invention not merely a substitute for a conventional keyboard instrument but a powerful tool for exploring an enlarged world of pitched sounds, where it would become possible to produce the notes and chords of a musical composition with any timbre desired out of their electrical elements'.

Some subsequent electronic instruments which were developed by others are:

- 1919-20, Thermoninovox : Leo Thérémin (1896-1939), Moscow.
- 1924, Thérémin : Leo Thérémin (1896-1939), Moscow.
- 1927, Sphärophon : Jörg Mager (1880-1939), Berlin.
- 1928, Ondes Martenot : Maurice Martenot (1898), Paris.
- 1930, Trautonium : Friedrich Trautwein (1888-1956), Berlin.

> Most were keyboard orientated, providing a single melodic output and an ancillary means of controlling volume, usually taking the form of a hand operated lever or foot pedal. The Thérémin was a notable exception, having no keyboard at all. Instead two capacitive detectors were employed, one a vertical rod, the other a horizontal loop. These controlled pitch and amplitude, respectively, by

> generating electrical fields which altered according to the proximity of the hands of the performer (Morgan 1991: 3).

While the technology was still in its infancy, during the first four decades of the 20th century, and the cost of developing such instruments was still astronomical, not many composers were in a position to experiment with these instruments during these years. Further developments were also temporarily halted because of World War II.

Brindle, referring to the early pioneers in the field of noise and electronics comments:

> They had the vision, but not the means, or at least not quite the means. Electric valve oscillators did exist in their time, and even the Hammond electronic organ was a product of the thirties. But the actual recording facilities were the problem. (One of the first electronic music compositions - John Cage's Imaginary Landscape No. 1 (1939) - had oscillator frequencies record on two 78 r.p.m. gramophone records, but normally such a system was too expensive and inflexible to be practicable.) It took a world war to produce what was almost the right instrument - the wire recorder - which was later replaced by the tape recorder, so flexible, versatile, and economical that sound could at last be recorded, altered, manipulated, made permanent, or discarded, with incredible ease and at negligible cost. Once the tape recorder was perfected (about 1950), and its potentialities full realised, other electronic sound equipment (either already existing or suitably modified) could be assembled to form the first electronic music studio (Brindle 1975: 99).

Composers who used these early electronic instruments in their compositions among others are:

- Olivier Messiaen (1908-1992)
- Paul Hindemith (1985-1963).

### 6.5.2 Electronic Music following World War II until the 1960s

Further development of electronic music in Germany was not confined to the work of a single figure, as was the case with Pierre Schaeffer's musique concrete. Also,

further progress took different routes on either side of the Atlantic. In the USA, due to the initial lack of institutional support, electronic music flourished somewhat later.

### 6.5.3 Equipment in Early Electronic Music Studios

Brindle (1975: 102) notes that at the core of most older electronic equipment are the tone generators. These devices produce the basic sounds and tones that an electronic music composer works with. Three basic kinds of tone or sound generators have been used:

- **Sine Tone Generators.** Also called sine wave oscillators. Sine tone produces a pure tone without any harmonics and comprising a single frequency of even dynamic level. The sound generated by these components may be compared to that of a tuning fork.

- **White Sound Generators.** White sound or 'noise' comprises a concentrated succession of random frequencies that are evenly distributed throughout the audio spectrum. The resultant sound is a hiss which may be compared to the sound of the sea as heard from a beach.

- **Square Wave Generators.** Square waves have a rich harmonic content and therefore produce sounds which contrast with sine tones.

It should be noted that each of these oscillators is only capable of producing one sound at a time, and the earliest systems were only capable of playing single notes at a time. As the systems improved and developed, more tone generators were added which allowed for multiphonic performances according to Devroop (2002: 3-17). The sounds produced by the generators would be modified by means of a variety of modulators, filters or other devices. Each of these components changes the original tone by altering the wave shape in some way. The most important of these are:

**Filters**

- Ring Modulation
- Reverberation
- Variable Speed Tape Recorders
- Dynamic Suppresser.

## 6.6 COMPONENTS OF MUSIC TECHNOLOGY

Devroop (2002: 3-18) identifies ten components of Music Technology. The following can be regarded as some of the Music Education components which can be used in a music teaching learning situation. In this case Devroop (2002: 3-19 – 3-22) lists these components as core components of Music Technology which are summarised below:

### 6.6.1 Electronic Musical Instruments (EMI)

For Devroop (2002: 3-19), electronic musical instruments are "musical instruments that generate sounds electronically rather than acoustically". Examples of these are controllers, sound modules, synthesizers, digital pianos, vocal processors and samplers. These instruments are mainly found in music studios and are meant for sound generation.

### 6.6.2 MIDI Sequencing (MS)

According to Devroop (2002: 3-19), MS is a "digital process whereby the information sequences of a musical performance (note-on/off tempo, dynamics, pitch, timbre, and the like) are captured by a computer, hardware device, processed and stored for purposes of further processing and/or output". The researcher understands this component as a method of using the devices to capture sound by means of software or hardware.

### 6.6.3 Multimedia and Digitized Media (MDM)

Devroop (2002: 3-20) goes on to say that, "this component refers to the integration of sound, text, graphics, animation and video in digital format". In this case the primary focus of MDM is on using the computer and other hardware devices to "create, manipulate, store and combine various media objects such as text, audio, video and graphics into a single presentation".

### 6.6.4 Internet and Telecommunications (IT)

General knowledge of computers and how to use and surf the Internet is a necessary starting point for modern Music Education as well as digital Music Technology. In this case music can be transported and recorded digitally through the Internet. This can be done through the World Wide Web (WWW) connection. Ellsworth & Ellsworth (1996: 8-12), cite the following advantages of using the Internet:

- E-mail and other world-wide communication is cheaper, faster and more reliable,
- Various new ways of keeping in touch with current news, trends, attitudes, new products and software become possible,
- Direct marketing and music sales can be done relatively cheaply,
- Information retrieval and utilisation is often very effective on the Internet.

The researcher therefore argues that Internet and Telecommunications are conceptually helpful in music production or music making, music consumption and music distribution.

### 6.6.5 Computer Music (CM)

Morgan (1991: 475) stresses that composers do not produce any sound themselves, at least not of the quality demanded by most serious composers because the central processing hardware of a computer does not generate sound. The computer presents a whole new dimension to the creation of electronic music since it simplifies the control of the synthesizer modules to an extent that exceeds the speed and

refinement any human is capable of. Therefore, Computer Music refers to the computer as a musical instrument that generates and synthesises sounds and act as a partner (accompanist/soloist) in live performance.

### 6.6.6 Music Notation (MN)

This component according to Devroop (2002: 3-20) refers to "the processing of music notation by means of computer software as opposed to the traditional process of a printing press. Music software is designed to print scores, extract and transpose individual parts, scan scores and generate MIDI performances".

### 6.6.7 Computer-based Education/Instruction/Training (CBE/I/T)

This refers to the use of computers as instruments when teaching Music Education. According to Devroop (2002: 3-20), "the software programmes are used for music theory, music history and analysis, developing ear-training skills, creation of accompaniment tracks, as well as drill and knowledge testing in a variety of areas in music and music education". This can impact the aspects of teaching, learning, recording, evaluating and testing of the competencies of music education achieved by learners.

### 6.6.8 Computers, Information Systems and Lab Management (CISLM)

The era of Technology has posed a major impetus on the management of information. Computers help to manage information effectively. Devroop (2002: 3-21) notes the following functions: word processing, working with databases and spreadsheets, desktop publishing, presentations and an integration of laboratory equipment within their working environments.

### 6.6.9 Audio Technology (AT)

This is referring to recording, mixing, processing, mastering or playback of sound which is commonly known as Sound Engineering. Examples according to Devroop

(2002: 3-21) include, "but are not limited to, magnetic and digital tape recorders, phonographs, harddisks and compact disc players".

### 6.6.10 Research in Music Technology (R)

This aspect refers to research techniques and designs in Music Technology and to create new knowledge. Aspects such as sound, performance and synthesis, computer music and sound techniques are researched (Devroop 2002: 3-22). This will provide learners with knowledge which can enhance their understanding of Music Technology in particular and Music Education in general.

## 6.7 MEDIA PROGRAMMING

In her research, Schoeman (1999: 2-52) discusses media programming as part of music making. What is disseminated through the media now fulfils the function of traditional story telling and entertainment. In the case of hardcopy, for the media consumer, access is provided through rectilinear arrays of periodicals and books in newsagents, bookstores or libraries. Videos and CDs are obtained by navigating through a similar array. Radio and television programme schedules are similarly organized – although viewers may simply zap through an array of TV channel numbers if they have more than one.

To this end Boughton (1993: 20) contends that profiling techniques are of course extensively used by academics to ensure they are informed of new papers relevant to their area of interest. Direct mail advertisers are extremely interested in developing customer profiles automatically to improve sales possibilities. The question that the researcher asks is how a student can be empowered to make more meaningful and informed media choices. This implies recognition of the student as a learner - a sensitivity to both what has been learnt by that person and their tastes and interests governing openness to any further learning. In an attempt to answer the question, Livermore (1993: 74) believes that techniques are required to offer choices across categories in any rectilinear array. This can best be imagined as a network associating disparate elements in the array on the basis of non-linear criteria associating a type of music to particular foods, for example. The easiest way

of building up such associative learning networks, to assist "newcomers" to a particular area of taste, is by relying on the associations of earlier explorers. The evolving cultural network – as a collective learning enterprise – then becomes the paradigm of choice rather than timid or crude explorations of the essentially meaningless arrays developed within the prevailing paradigm. This clearly indicates that a new paradigm has emerged and that transformational understanding of teaching music has to change.

In support of the above paradigm shift, Morrison (1997: 114) asserts that:

> I began to wonder some years ago why my children were learning science in such a crazy fashion. Teachers told them to do lab experiments but gave them no textbooks or notes to explain why they were doing those experiments or what they meant - evidently, the students were supposed to work it all out for themselves. At a P.T.A. meeting, I protested and was told that this was the new fashion in education. None of the other parents, I was informed, had made any complaint, except the ones who were scientists. This circumstance seemed to me to indicate a problem. Most scientists have never heard of the "Science Wars"; they are too busy working to worry about how sociologists think their enterprise progresses. But it is becoming increasingly common knowledge that a harmful vision of science has been steadily taking over education in schools and universities.

Morrison then decided that the problem was in the "new" way of learning and understanding science:

> Cromer gradually compares science and its methodology with the ideas of the "postmodernists," who question the objectivity of science and even the existence of objective reality. What I found particularly worrying in this section of the narrative was the author's description of how postmodernists have applied their ideas to education. In that arena, the movement is called constructivism, derived from the notion that all facts are socially constructed rather than being deduced from evidence. I often hear American scientists lament the low standard of education in their public schools. After reading Cromer's explanation of how constructivists have worked their ideas into science teaching programs and introduced their nonscientific ideas, I can well understand how these actions have exacerbated the problems (Morrison 1997: 116).

The above citations show that the frame of reference has changed from modern paradigm to postmodern paradigm, and therefore presents a challenge to those dealing with education and curriculum. Traditional methods of teaching and learning are to be replaced by new methods and approaches suited to the present millennium. These new innovations are coupled with new technologies in teaching; hence a new medium of instruction comes to the fore.

## 6.8 INFORMATION TECHNOLOGY AND MUSIC EDUCATION

There is a noticeable link between music and information technology, and therefore it becomes easier to teach music using information technology as it provides reliable information. At times one believes that information technology minimizes time and pressure of work as it can be used as a teaching tool.

Computers and other technological advances allow for the arts educator opportunities to generate, manipulate, copy and transform a vast array of hitherto unknown images and sounds (Boughton 1993: 22). In this sense, computer technology engages students in a new and exciting creative experience (Livermore 1993: 77).

The introduction, in Australia, of the National Statements and Profiles has placed a long overdue emphasis on creativity in Music Education; a situation that has caused many teachers and curriculum planners to rethink their approach towards the way Music Education should be delivered. Creativity implies **doing,** and in this context the teacher becomes more of a facilitator than a fountain of information. While recognising the place of creativity within the music curriculum, the Profiles also make frequent reference to the students' need to be able to use and understand information technology as a resource tool in their creative activities. This latter point is further strengthened by the identification of the use of technology as being one of the seven Key Competencies listed in the Mayer Report (1992).

It is interesting to note that with the introduction of a National Curriculum in England's schools, emphasis has also been placed on developing the student's ability

to compose, perform, listen and appraise as opposed to a curriculum based on theoretical skills, music appreciation and historic knowledge.

Ellis points out that England's Curriculum requires by law composing as a curriculum activity for all children between the ages of 5 and 14. Music teachers in England are encouraged to present music as a unified experience, comprising composing, performing, listening and appraising, as distinct but interdependent activities. England has a legal requirement to use technology "where appropriate", and has some items of technology that have built in a set of features which can enable the reunification of the roles of composer, performer and critical listener, contends Ellis (1998: 13).

It would appear that South Africa is falling far behind when it comes to introducing technology into music classes. Although contemporary music and technology have already affected common attitudes toward traditional approaches to music performance, composition and learning, a crucial problem exists in Music Education: the fundamental technology illiteracy of many South African music teachers who were trained prior to the mid-1990s. Another problem concerns the what, when and how of integrating Music Technology so prevalent in the music culture within the confines of the music classroom.

The argument presented by Merrick (1995: 193) sheds light on the problems facing South African music teachers in their endeavour to teach Music Technology at schools. In the recommendations resulting from his study, Merrick stresses the need to address not only the current computer application level of teachers, but also teacher attitudes towards Music Technology (Merrick 1995: 195). Adequate school resources also proved to be a major concern along with the need for regular in service training. Merrick's findings are further supported by research undertaken in Western Australia where Sam Leong surveyed 170 teachers. Of these, 118 taught in primary schools and 52 in secondary schools. In his conclusion Leong states that:

> The survey has identified three major obstacles to music teachers using technology: curricular constraints, budgetary support and teachers' expertise. These need to be carefully examined and addressed before the Key Competency of using technology (as

> advocated in the Mayer Report) can be properly taught in our schools. Concrete solutions must be found to accommodate technology in teacher preparation courses, the continuing education needs of music teachers, and to identify and meet the minimal requirements of music hardware and software in both schools and tertiary institutions (Leong 1995: 25).

While the researcher agrees with most of these findings, any change taking place in education is generally a slow process and it takes an enthusiastic and creative teacher to overcome the barriers that exist. It is true that teachers must be afforded adequate training in the use of Music Technology if they are to use it effectively in their classrooms. It is also true that the financial support for the installation of Music Technology hardware is often difficult to obtain. And it is also true that integrating information technology into a music programme without any clear guidelines of examples from curriculum documents may often prove to be a daunting task for many teachers. However, most of these problems can be overcome if teachers are prepared to take up the challenge.

From an educational point of view, Music Technology programmes, along with most other creative music software packages, offer the valuable ability to play back immediately what has been composed at the desired tempo and with the instrumentation selected by the composer. This enables students to fully appreciate what they are doing and further enables them to make aesthetic choices in relation to the use of the elements of music.

## 6.9 THE VALUES OF TECHNOLOGY-BASED MUSIC EDUCATION

Devroop (2002: 2-20) identifies subdomains which are the values of technology-based Music Education. The researcher agrees with the following:

- Technology-based music instruction builds on competencies established at the previous school level.
- Use of technology is a regular and integral part of instruction.
- Learning profiles (e.g., attendance records and progress reports) for individual students are maintained using databases and other record-keeping technologies.

- Learning experiences in the curriculum include the use of computer-assisted instruction, sequencing, music notation software, Internet music resources, and electronic musical instruments to help students acquire the knowledge and skills listed in the National Standards.
- Software and hardware selections are made based on the learning goals established for the students.
- Digital keyboards and various controllers are available and are integrated into music performance ensembles where musically appropriate.
- Music classes have the same degree of access to school technology resources, including technology labs, as other classes in the school.
- Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.

The use of technology in music curriculum should evolve from the desire to use technology in artistically meaningful ways such as music processing and music creation. The music programme in schools should satisfy this desire in two ways. First, students use the technology as a tool to learn traditional musical processes such as writing songs. Second, the students use the technology as an inspiration to create new musical information such as electro-acoustic works or soundscapes. In this second context, the technology is more than just a tool: it becomes part of the media that is used to create the final work.

Through a balanced curriculum based on term units as outlined by Dixon (1998: 25-27), students can choose from six optional and two compulsory units and elect to be involved in the following activities:

- Song writing using computers, synthesisers and sequencing software
- Recording of songs and ideas using portable recorders
- Writing of audio CDs using computer driven CDR to archive projects
- Using computers, synthesisers and sequencing software to create computer performances of otherwise 'unperformable' music
- Using computers and audio software to perform manipulations on sampled acoustic sounds

- Using computers and multimedia software to develop multimedia projects
- Using computers together to synchronise audio and video tracks in multimedia projects
- Using computers together with CD-ROM to access information on traditional musical topics
- Using a digital recording studio to create large scale works from many different sounds, sources and pieces of musical information.

Schoeman (1999: 2-52) supports the above points, noting that the emphasis in any of these activities should not be on the equipment being used but on what the students can create using that equipment. In a sense, the learning about the technology is subservient to the creating of the music. Because of this, the students are less reticent to 'learn' the technology and work with it than they are when the technology is explicitly taught.

## 6.10 CURRICULUM PLANNING FOR MUSIC EDUCATION TECHNOLOGY

In the case of South African schools, and this research study in particular, the essential outcomes in relation to introduction of keyboard, computer notation, synthesisers, Digital Audio Tape, CD ROM and DVD recorder in all foundation, intermediate, senior phases as well as further education and training and the higher education band, in the Music Technology programme are to create an environment where students will, according to Devroop (2002: 5-10), be able to:

- develop their creative musical potential
- broaden their musical horizon by direct contact with students and music from around the world
- develop their knowledge and understanding of music via the manipulation of sound using modern technology and via feedback from teachers and peers
- develop confidence in the use of modern technology
- discuss and compare with confidence their reactions to a musical event with those of other students from around the world.

Having established the general outcomes for the levels above for a Music Technology curriculum programme, the researcher will now set about examining the possible learning outcomes, which are based on the principles of Outcomes-based education.

### 6.10.1 Learning outcomes: intended (Devroop 2002: 4-8)

From the information given so far, the researcher concludes that the intended student learning outcomes for Music Technology are as follows:

In creating, making and presenting students can:

- Experiment with ideas and explore feelings to find satisfactory solutions to tasks
- Compose short works using midi technology that explore all aspects of the elements of music
- Use appropriate techniques to produce, record and notate sounds using sequencing and notation software
- Use appropriate techniques for encoding and decoding midi files
- Use appropriate techniques for the performance of midi files.

**In arts aesthetics and criticism students can:**

- Discuss and compare with confidence their reactions with those of other class members to a musical event
- Explain to others how they produced a composition, giving reasons for choices of musical elements and changes made during the process.

**In past and present contexts students can:**

- Talk about the way music is used in different social and cultural groups and broadly classify their styles
- Compare examples of music from several different times, places and cultures, identifying salient differences in musical characteristics.

### 6.10.2 Assessment (Devroop 2002: 4-12)

The most notable forms of assessment with reference to Music Technology are:

- The ability of music software programmes to instantly play back all or part of a student's work at any desired time, thus enabling the student to develop a greater understanding of the elements of music (rhythm, pitch, melody, harmony, timbre, texture, dynamics, form, balance and structure) and their role in the overall structure of a composition.
- Similarly notation software programmes offer students a direct visual contact with their creative efforts. Students are able to see their works fully notated and are able to manipulate these scores in a variety of ways to achieve a result that is both musically correct and satisfying for them.
- The vast number of sounds that midi offers to students presents them with an opportunity to experiment with timbre and textures and being able to hear their choices instantly enables students to develop aesthetic taste and judgment.
- The Internet and E-mail has enabled students to gain a multicultural perspective, which has broadened their musical horizon and encouraged them to share their creative experiences in a non-threatening environment.
- The use of E-mail has meant that students are no longer limited to assistance and feedback from their classroom teacher. Students are encouraged to discuss their work with their peers in other participating teams.

## 6.11 INTERACTIVE TECHNOLOGY-BASED MUSIC INSTRUCTION

The best solution for incorporating technology into the classroom is for each individual student to have identical software. Hardware could be very expensive for them, but with identical software as a teacher works through a problem, the student can work along with the teacher. A student is no longer able to daydream through a lecture because he/she is actively participating with the teacher. Because the student is spending class time actively, he/she is acquiring technological skills throughout the experience. Although good, this mode of teaching has its own problems, such as cost and the pace of the lesson which is slowed down because the instructor must demonstrate the procedure and then have the student repeat, which doubles the time

of a presentation. The following components can enhance interactive technology-based music instruction:

### 6.11.1 Audio cassettes

It is common sense that sound should be considered to be the core of music and Music Education. With sound as an important core outcome of music, therefore, the inclusion of audio cassettes is imperative in any Music Education programme. In Music Education, learners are introduced to music either by creating their own music through singing, movement, reading of music notation, instrumental playing and creativity or by listening to music examples.

The audio cassettes or the tape recorder which stores sound information make available the following procedures (Schoeman 1999: 2-54):

- Changes in the playback speed of a tape affect the frequency and duration of sounds recorded on it. When the speed is increased, the duration is shorter and the frequency higher.
- Any succession of sounds can be assembled by recording each sound on a piece of tape and then splicing the pieces together. The duration of each sound will depend on the length of tape it occupies.
- Tapes can be played backwards. One result of this is to convert fading sound into crescendos; and vice versa.
- A tape can be spliced into a continuous loop, and this loop can be used to create an ostinato.
- Strands of material, recorded on parallel tracks, may be superposed by playing them into a mixer and then re-recording the result on another track or another tape recorder.
- Recorded sound can be processed by additional devices, such as filters, reverberators and modulators.
- Audio cassettes can be successfully used to present music of different styles and genres. By listening to music, learners can become aware of good quality music. Through electronic machines, new ways of ordering sound become available, and many composers have combined electronic music

recorded on tape with solo live performance. The researcher concludes that the following factors according to the same author (1999: 2-54) should be taken into consideration when sound examples are selected:

- Suitable music examples should be selected to underline the learning outcome of the listening activity.
- The material should be selected with the listening environment in mind. The learners should know what the purpose of the listening activity is.
- The selected sound material should be relevant to the learner's age and level of comprehension.
- Short music examples should be selected that explain the purpose of the listening activity.
- The recorded music should be of good quality.
- The selected material should not violate copyright laws.
- Learners should be encouraged to become active participants in the learning process. The learning material accompanying the audio cassette should therefore facilitate activities for the learner to engage in, whilst listening to the examples. These activities must be preceded by learners having had an experience with the listening guides and questionnaires set by the teacher. Then, learners could be asked to design a listening guide or questionnaire. By doing so they get the opportunity to highlight and recognise the elements of music.

### 6.11.2 Video cassettes

According to Schoeman (1999: 2-54), the focus is not on interactive television but on the use of video cassettes in the learning programme of Music Education. These are also regarded as instruments used to convey sound to the listeners. By incorporating video cassettes in the music or any learning process the educator can show the learners material that would usually be inaccessible. Videos help provide a multi-sensory method of teaching and learners can learn actively by seeing and hearing. Therefore through looking at video material, learners are introduced to information as well as a variety of sound and audio stimuli. Learning does,

therefore, take place by means of auditive and visual encouragement. Video in the learning programme can be used to:

- explain and highlight the history of music;
- show learners didactical approaches in practice;
- demonstrate teaching processes and skills;
- explain and demonstrate the practical components of a subject; and
- compare and evaluate various teaching strategies.

It is, however, important that the learners are guided in their use of the video material. They should know what and why they are looking at the video. According to Thomas (1994: 98), specific tasks and/or outcomes should be highlighted by the educator prior to looking at the video to enable the learners to follow the theme.

### 6.11.3 Computer-assisted learning

A computer can be defined as a device which receives information, acts upon it, and furnishes the results in a form readable by either a person or a machine. In the case of music, the information which the computer receives and acts on is "sound", which can therefore be used in association with the synthesizer and become a valuable tool for the composer.

The *New Grove Dictionary of Music and Musicians* (Sadie 1980: 109) sets out ways in which computers may be used compositionally:

- To compose or to assist in the composition of music.
- To control sound generating and processing equipment, much in the manner of synthesizer devices.
- To synthesize sound (music, speech or whatever) by the construction of sound waves in digital form, which is converted to sound by means of a digital-to-analog converter.

Schoeman (1999) claims that the third point above is one of the most versatile methods of sound generation: since the sound wave is constructed directly, there are almost no restrictions on sound properties. This means of generation has the

advantage that the computer can be called upon to assemble the individual sounds of a composition, so that the composer has to be concerned only with the conception for the computer. A composition must first be encoded as input to the computer, then run on the computer and finally converted into sound; though these three processes introduce a hiatus between conception and realization, the composition is likely to be heard with less delay than is an instrumental piece. There are other advantages: almost any large general-purpose computer can be used for sound generation; and the devices of a synthesizer can be simulated by a computer programme. A disadvantage is that the music cannot be altered in real time. The following can be identified as forms of computer education which can facilitate Music Education, and a brief account is given hereunder:

- Computer-managed instruction
- Computer-assisted instruction; and
- Computer-based instruction (Romiszowski 1984: 25).

These forms are discussed by Schoeman (1999) below:

#### 6.11.3.1 Computer-managed instruction

Computer-managed instruction gathers and processes information about the learning programme and the learner's progress. Computer-managed instruction uses the capability of the computer to manage the progress of a student through a programme of instruction.

#### 6.11.3.2 Computer-assisted instruction

The purpose of the computer in this mode is to present instruction that is simple, straightforward and individual for each learner. In computer-assisted instruction, a computer administrates the instruction. This is done through the facilitation of drill and practice exercises. Through stimulating real situations, the learners are given the opportunity to apply their knowledge in practice. The computer keeps records of the learners' progress and this is used to monitor their progress (Romiszowski 1984: 28).

#### 6.11.3.3 Computer-based instruction

Computer-based instruction refers to learners' using learning programmes on a private computer (Moore & Kearsley 1996: 37). This includes CD-ROMS and Web-based courses. With computer-based learning aids, the computer is used as a tool in the learning process. The computer assists the learner in structuring the learning material, thereby becoming a tool to assist the learner in the thinking process (Romiszowski 1984: 29).

An important difference between computers and other forms of media is the number of control capabilities the computer offers. These capabilities include the ability to present and receive, process and manage information. By involving a computer in the learning process, a number of tasks can be performed. The computer can adapt to different levels of learner expertise and can act as a learning tool to help the learner, no matter what his/her current level of knowledge is. Audiovisual media and computer-assisted learning are traditionally considered to be separate. With the development of new hardware and software technologies it is, however, possible to combine the two as part of interactive computer-assisted learning (Jasper 1991: 161-162).

From the above discussion, it is clear that a computer is an instrument as well as a tool. Therefore, thinking of the computer as a musical instrument recognizes its ability to be a medium of human expression, and places it in a category familiar to Music Educationalists, situating it in an artistic context. According to Brown (1999: 14-15), a musical "counterpoint" with computer leads to engagement in the following ways:

- A computer's capacities, provided by its hardware and software features, should complement the skills of a musician. This partnership is like a duet, each partner providing capabilities which combine in the musical result.

- Familiarity requires time spent exploring the instrument, learning how others utilize it, and becoming sensitive to its abilities and idiosyncrasies.

- A deep level of engagement and enjoyment requires a balance of skills and challenges.

- Engagement is more likely to be recognized when the musical activities that musicians are involved with, are valued by themselves and those around them. Thus, musical activity with a computer must be meaningful to the musician, not trivialized.

## 6.12 THE EDUCATIONAL IMPACT OF THE WORLD WIDE WEB (WWW) ON MUSIC EDUCATION

One of the services available on the Internet is the World Wide Web (WWW) or as it is commonly referred to, the Web. The WWW consists of millions of Web sites (consisting of Web pages or electronic files and documents). For example, the Web pages may consist of text, graphics, sound and multimedia. A Web page may also include hyperlinks. By clicking on a hyperlink, the user can move to another point on the same page, other pages on the same Web site or another Web site. Hyperlinks thus help users to retrieve information in any order they prefer. It is sometimes also called a Web presentation. The Web pages are linked together in a meaningful way, which, as a whole, describe a body of information or create an overall consistent effect (Lemay 1995: 27). The top page in the layer of pages for a Web site is called a home page (D'Angelo & Little 1998: 71). A home page usually contains a general overview of the Web site and of specific information contained on other pages on the site. Each Web site has an address, called a Uniform Resource Locator (URL).

Web pages are created in Hypertext Mark-up Language (HTML) which are the codes to display the Web pages. Such pages are also referred to as marked-up documents. HTML makes it possible for browsers such as Netscape and Microsoft Explorer, to view Web pages. More recently, Web pages are also created in other mark-up languages such as XML and Java Script. Creating a quality home page that will be valued by local and external visitors to the home page requires sound planning, contends Van Brakel et al (1995: 387). The same applies to the creation

of Web sites. This thesis will consider some of the guidelines that can be used in a Music Education curriculum environment. It provides guidelines to:

- Decide on the purpose of a Web site for Music Education
- Decide on the information to include on a Web site
- Plan the layout and structure of the Web site
- Standardise the page layout according to sound design principles
- Use basic HTML
- Maintain a site.

The increase of computers in the present society resulted in the increase in Web-based courses, and music is no exception. This is mostly due to the need for less expensive courses and the ever growing need for learner convenience (Pieterse 1998: 44). Web-based and computer-based instruction employs the interactive, multimedia technologies of the Web as well as the worldwide structure of the Web to deliver and support a course. Originally the Web was used as a static medium for presenting text and graphic examples. Interactive use of the Web is, however, now becoming increasingly popular. By encouraging learners to make decisions and answer questions, they take control over the learning content. "Interactivity is a necessary attribute of any successful educational technology. Learning is generally more effective when the learners can control the information exchange" (Fouche 1998: 51). The need for cheap, easily accessible learning opportunities has increased the importance of Web-based instruction.

With the increased development of the internet, the merging of audio and visual stimuli becomes common practice. Instruction through the Web is computer-based and involves interactive multimedia technologies and resources as well as world wide support and information structure (Pieterse 1998: 43). Apart from these advantages, the following advantages and disadvantages were compiled, in Table 6.1 from Pieterse (1998: 43), Schoeman (1999: 2-57) and Harasim (1995: 15).

Students use the Internet for music activities, such as conducting research, communicating with peers and authorities, and developing and publishing Web materials. Distance-learning (i.e. learning through two-way audio/video

conferencing or Internet-based systems) experiences are part of the curriculum. As course offerings via this delivery system become available, music instruction is included on an equal basis with instruction in other subject areas.

**Table 6.1: Advantages and disadvantages of Web-based instruction**

| ADVANTAGES | DISADVANTAGES |
|---|---|
| **Introduction**<br>No travel and accommodation expenses are involved. The learner only needs to subscribe and log on to the internet. | **Introduction**<br>The available band-width limits the accessibility of the material on the Web. This problem will increase as more people subscribe to the internet. |
| **Available and convenient**<br>The internet is always available. This enables learners to access information at their own time and pace | **De-humanisation**<br>Computerised instruction results in the learner not having personal contact with the facilitator. Learning becomes an interpersonal experience. |
| **Efficient**<br>Learning material can easily be changed and adapted. | **Static instruction**<br>Lack of contact between the learner and facilitator results in the learning process becoming static. |
| **International**<br>Learning programmes can be accessed across geographical borders. | **Development**<br>To develop Web-based instructional material is time and resource consuming. |
| **Communication**<br>Internet learner can make contact with other learners via chat rooms and e-mail | **Computer constrains**<br>Not all material can be effectively presented on the internet. Certain subjects should have an interpersonal background. |
| **Resources**<br>Online studying enriches the learning material and environment and introduces learners to new ideas, perspectives and cultures. Cross-cultural understanding is facilitated. | **Power failure**<br>Power failures prevent access to the learning material. |
| **Access**<br>Learners have equal access to information and the facilitator. Learning is an equal opportunity for all participants.<br><br>**Active learning**<br>All learners are expected to become active participants in the learning process. | |
| **Confidential**<br>Learners' personal questions can be answered confidentially by using e-mail. | |
| **Encouraging**<br>Immediate certification of completed courses is possible via the Web. | |

## 6.13 DESIGNING WEB-BASED INSTRUCTION

When designing a Web-based course, one cannot take a written, paper-driven handbook and copy it onto the Web. The Web will then only be used as an electronic page turner (Schoeman 1999). Academics who have presented their courses in this fashion on the Web have found that learners simply download the information and study from the printed text. Khani in Le Roux (1998: 67) describes the correct use of the Web as a learning facilitator by explaining that the Web should be an instructional strategy which should use its attributes and resources to create a meaningful environment where learning is fostered or supported. The Web should be used as a thinking tool that facilitates understanding and self-testing. General design principles are given by Harasim et al (1995: 145) and Barron & Tai (1998: 19):

- Identify the need and educational activity that can be presented as an online activity.
- Ensure access to the requisite computer resources and systems. The programme designer should ensure that access to the web-site is possible and convenient. This could be done by using standard software which is regularly available.
- Obtain administrative support. Support systems should be in place to help with system or learner problems.
- Design the curriculum. The web document will be most effective if the content and learner population are analysed. The structure of the course should be determined. This includes the formulation of learning outcomes and facilitation of skills.
- Develop educational material. After the curriculum outline is determined, the content of the course should be structured.
- Design the online environment. The actual design involves the selection of the most appropriate software and design tools.

Music teachers and students may also use an assortment of word processing, database, spreadsheet, and graphics software, as well as electronic encyclopaedias, electronic mail, and World Wide Web programmes. Involvement in the learning is

a key principle. According to the constructivist learning approach, learners should be considered to be individual in the learning process, each bringing their own background and needs to the learning process. This means that learners are given the latitude to learn and progress according to their abilities and potential. This does not imply the promotion of individualism, but encouraging learners to actively involve themselves in the learning process.

## 6.14 INDIVIDUALIZED TECHNOLOGY-BASED MUSIC INSTRUCTION

The above shows how music can be designed with the help of computer and mixer as instruments which can facilitate teaching and learning. This opposes the traditional view of a student working alone at a computer as this may allow students to use a computer, but does not force the institution to provide computers for every individual in the classroom. The student can either follow a prescribed plan of action set forth by the teacher, or, at a higher level, devise projects of the student's own design, contends Jonassen (1997: 3). One problem with having the individual working separately from the class is the student's missing what is happening with the rest of the class while enjoying personal time on the computer. Another problem is that any particular student will have a very limited amount of time working with the computer since each student is limited to taking turns.

## 6.15 CURRICULUM PLANNING OF TECHNOLOGY-BASED MUSIC EDUCATION

In establishing music curriculum at schools, the fundamental outcomes according to Thomas et al (1994: 96), and which the researcher supports, should be to:

- Provide Music Education that was relevant to a new generation
- Provide novel and interesting ways to develop musical knowledge and skills
- Broaden students' perception of music as an art
- Integrate technological literacy into musical processes
- Free students from traditional limitations, enabling them to use, process, modify and create musical information in fresh and dynamic ways.

## 6.16 OUTCOMES FOR STUDENTS AND TEACHERS RELATED TO TECHNOLOGY APPLICATIONS

**Student Outcomes**: The effectiveness of technology tends to vary as a function of the curriculum content and instructional strategy delivered by the technology. When content and strategies are determined to meet accepted education standards, research shows that technology (Riesbeck 1996: 53):

- Increases performance when interactivity is prominent,
- Increases opportunities for interactivity with instructional programmes,
- Is more effective with multiple technologies (video, computer, tele-communications, etc.),
- Improves attitude and confidence, especially for "at risk" students,
- Provides instructional opportunities otherwise not available,
- Can increase opportunities for student-constructed learning,
- Increases student collaboration on projects,
- Increases mastery of vocational and work force skills,
- Helps prepare students for work when emphasized as a problem solving tool,
- Significantly improves problem solving skills of learning handicap students,
- Improves writing skills and attitudes about writing for all students,
- Improves writing skills as a result of using telecommunications.

**Educator Outcomes**: Research on the benefits of technology for teaching is generally positive with a shift from the more traditional directive to a more student-centered approach. Research shows that educator use of technology results in:

- Less directive and more student-centered teaching,
- Increased emphasis on individualized instruction,
- More time engaged by teachers advising students,
- Increased interest in teaching,
- Interest in experimenting with emerging technology,
- Teacher preferences for multiple technology utilization,
- Increases administrator and teacher productivity,

- Increased planning and collaboration with colleagues,
- Rethinking and revision of curriculum and instructional strategies,
- Greater participation in school and district restructuring efforts,
- Business partnerships with schools to support technology,
- Increased education involvement with community agencies,
- Increases in teacher and administrator communication with parents (Devroop 2002: 2-5).

## 6.17 TECHNOLOGY DEVELOPMENT AND APPLICATIONS TO SUPPORT TEACHING AND LEARNING

**Technology development factors**: Research shows that particular features of technology-based resources are critical for effective technology applications in education and should provide for or incorporate (Hammond 1992: 156-162):

- Immediate adjustment of task difficulty in relation to student responses.
- Instant feedback of correctness of responses.
- Ease of use by students and teachers.
- Sustained interest and use by students.
- Simulations of tasks not possible in the classroom or from books.
- Student control of pacing the educational programming.
- Opportunities to use multiple technologies.
- Built in assessment and procedures to matched technology resources with learner needs.
- Field testing of technology-based resources with a variety of students in a variety of settings.
- Involvement in the development of educational technology programmes.
- Alignment with curriculum frameworks and existing instructional resources.

**Technology application factors**: The following are general considerations that research and evaluation studies document as important features to include in the application of technology-based resources. These studies suggest that technology should provide for or promote (Hannafin & Peck 1988: 8-13):

- Teaching that cannot be easily accomplished without the technology.
- Guidelines for teachers on how and when to integrate the technology into instruction.
- Expansion or enhancement of the curriculum.
- Integration into current and emerging curriculum standards and guidelines (interoperability).
- Access to technology and educationally relevant programmes.
- Ease of adaptation of technology into a variety of learning environments from school to home.
- The use of the technology within the regular classroom or learning environment.
- Adults that can promote meaningful student-use of technology.
- Adaptation of technology with diverse student populations.
- Involvement of teachers and administrators in the design and implementation of educational technology.

## 6.18 PRINCIPLES OF MUSIC TECHNOLOGY

Music Technology and MIDI labs can benefit both teachers and students by helping to make music learning an engaging, creative process. Planning for technology, however, can be a complex undertaking. It is especially important to avoid the pressures to have technology for its own sake.

In order to encourage students to use technology to engage with music rather than simply as a tool, a number of principles suggest themselves from the above discussion as cited by Harding (1998: 354-68). Therefore, the researcher makes his own conclusions as follows:

### 6.18.1 Integration

If a computer is to have any chance of being treated as a musical partner, it needs to become part of the life of the music department and the curriculum just as other instruments are. This includes being available for use in music classrooms for general use, not necessarily a computer or technology lab, and available in

'practice' rooms for individual use. As well, technology or computer music works need to be included in concepts, CDs and other public presentations. It may take long to realise this in South Africa, but it is advisable to start planning for such initiatives as a way of transforming Music Education.

### 6.18.2 Specialization

Students should be able to study technology or computer music as a principle study from the General Education band to the Higher Education band. While technology is used for some students to have some access to computing resources, particularly for tool functions like music publishing, there must be provision for some students to become experts in computer music composition, synthesizer performance, and digital media production. Therefore, it is necessary for schools to make sure that Music Technology becomes a fundamental and core to the study of music.

### 6.18.3 Quality

All music educators should be concerned with providing quality experiences for their students. Computer or technology-based music-making is no different. It must provide students with quality Music Education and practical experiences. Particular care should be taken with assessing students' computer music, as many teachers may be unfamiliar with practices and standards. The researcher believes that maintaining a consistent ear for general musical values goes much of the way, being careful not to simply transfer value systems from other musical styles. Quality of repertoire and musical product can be maintained by increasing exposure to what experienced computer musicians are doing via CDs, visits to concerts, and guest visits. Regarding the quality of equipment, it is important to listen to the systems and trust your ears on sound quality. Also look to what experienced computer musicians are doing and using, copy them and seek their advice.

### 6.18.4 Reward

To encourage greater use of the computer as an instrument there need to be incentives as this type of venture or course is difficult. These can come in many

forms, but the most valuable will be recognition via public performance, prizes and personal encouragement. It is important that the students' work with computers and synthesizers is seen as being as valuable as other musical activities. This is another reason to enable specialization and monitor quality, because superficial recognition of clearly mediocre results is usually quite transparent to students.

## 6.19 SUMMARY

Curriculum 2005 places great emphasis on Technology, which is also one of the eight identified learning areas into which the national curriculum has been divided (DoE 1997a: 14-15).

It is evident that the new approach in education takes technology seriously to an extent that it is given the status of a Learning Area. This Learning Area will promote "all aspects of technology: planning, design and manufacturing, and it is to be introduced from the lowest grades at school" (Dixon 1998: 2). The emphasis on Technology Education by the Ministry of Education (Asmal 2000) is a positive development for music educators, especially at the time when the arts are being marginalised. Music Technology presents itself as a "saviour" to Music Education, in that technology-based education is given preferential treatment by national government. Curricula, funding, employability, marketability and the goals of lifelong learning within the music sector need to embrace Music Technology as a transformational mechanism.

This research study has introduced the advances of technology in the form of avant-garde which is the increased usage of electronic musical and audio equipment and computers for music applications and therefore, suggests a trend that supports the overall technology boom or era. To a certain extent the variety of devices, processes, products, applications and research related to music and technology has given birth to Music Technology, the field of study. This field is about knowledge and skills in the form of outcomes that are related to music activities.

It is time that the 21st century gives way to look for roots of the new musical style that will gradually mature in the present period to produce the field of Music

Education. It is apparent from the discussion in this Chapter that a body of technology knowledge has been developed over time. This body of knowledge relates to music and shows how emerging technologies have helped to move the field forward. The areas of audio technology, electronic musical instruments, Internet, telecommunications and computer are clearly identifiable through the historical development in Music Technology.

Traditional patterns of teaching have changed. Nowadays the computer forms the basis for most of the applications relating to Music Technology discussed above. Therefore, it is crucial to understand how computers work, the systems related to computers, computer laboratories and computer-based education and training. There is currently an increase in computer training/instructional software for musicians and music educators in South Africa. Everyone wants to be computer literate and be able to access information from the Internet. Besides, formalised studies in computer literacy or information have traditionally fallen outside the ambit of arts-based disciplines.

If Music Education is to be transformed so as to respond to international trends in Music Technology, it is in a predicament in that the approach towards pedagogy has shifted from being teacher-centred to learner-centred and the learning content needs to affirm the musics of global cultures. It was apparent during the course of this research study that most Music Education programmes are still largely dominated by Western art music curricula, where indigenous knowledge systems have not been fully implemented as formalised studies within existing curricula at South African schools. Due to the previously fragmented education system in South Africa, discussed at the beginning of this research study, these issues are pivotal in bringing about transformation and would therefore need to inform the design of new curriculum and qualifications. Therefore, the whole paradigm of Music Education must change in order to reflect the trend the South African education system is taking.

Arts-based disciplines are threatened within the new education framework, because of poor funding and lowly recognition, when compared to disciplines such as Mathematics, Science and Technology. However, the survival of Music as part of

an Arts and Culture Learning Area within this education framework is secured more so if it is combined with Technology. Therefore, Music fits very well with the premise that South Africa is part of the global community which is technologically oriented and that together with the advent of Curriculum 2005, the scope of Music Education is broadened. This is apparent from the prominence and significance attached by national government to arts and culture as well as technology and technology-based education. Music Technology (computer music) therefore need no longer be regarded as a mechanised musical language, but rather one in which the composer's free inspiration can be brought into play and a field that learners can specialise in.

# CHAPTER 7

# EVALUATION, CONCLUSIONS AND RECOMMENDATIONS

## 7.1 INTRODUCTION

The modernist paradigm encompasses a musical era, the beginning of which dates back to the early days of polyphony and its end coincides, in South Africa at least, with the liberation songs of the 1950s. In this old paradigm, the era stylistically described by a continuous, linear process of melodic, harmonic, rhythmic and formal emancipation, the unsuspecting artist was elevated to a position previously held by the Divine. According to the new paradigm, which describes and gives a face to restructuring and transformation, Music Education of the present era is not much concerned with the internal unfolding and/or development of musical ideas, like in Western aesthetics, but with how these musical ideas are perceived.

As South African society has moved into the new millennium, Western 'high art' can no longer be the sole focus of attention in school music programmes. Outside school, youth are now exposed to a wider range of music than ever before. One of the healthiest trends in Music Education during the past two decades has been a growing recognition that people must provide for the cultural and spiritual needs of indigenous peoples, as well as those whose reach is outside the Anglo-European tradition.

## 7.2 ANSWERING THE RESEARCH QUESTIONS

The main research question of this study was:

How can a balanced and relevant Music Education curriculum be developed that can be used by all schools in South Africa?

This question was answered by first reviewing the status quo of music curricula in South Africa. Information was gathered from literature review of primary and secondary sources. Thus, theses, dissertations, journals and government sources

were used to gain understanding of the problem and also evaluate these sources against the formulated research problem.

The answer to the research question is first seen in Chapter 2 where change in education is discussed in the context of Outcomes-based education (OBE), its implication on curriculum development in South Africa and how it affects the arts in general and music in particular. The answer cuts across Chapters 3, 4, 5, and 6.

The researcher addressed several sub-questions simultaneously with the main research question.

Chapter 2 addresses these questions:

- What is the structure of South African education system?
- What is Outcomes-based education?
- How do outcomes play out in a resource-poor Education context?
- Do outcomes in different musical contexts mean the same thing?

Chapters 3, 4, 5 and 6 address the questions below:

- Is the present Music Education programme for South African students balanced and relevant?
- If not, could a balanced, constructivist and relevant Music Education programme be a solution?

Outcomes-based education is an approach that promotes lifelong learning. It is a shift from content-based education with the emphasis of a flexible curriculum.

The specific outcomes for Arts and Culture Learning should guide teachers to ensure a balanced programme. These outcomes present a challenge for teachers to move away from a narrow, limited music programme to one that embraces a spectrum of opportunities and experience for both learner and teacher. The approach adopted in this research study is that different musical cultures have

different musical outcomes which in the view of the researcher should be integrated into new South African Music Education curriculum.

The fact that South Africa was previously divided according to race, colour and creed implied that education was also divided and music in particular was disintegrated. Therefore, during this research study, music was seen as undergoing transformation and restructuring to meet the challenges of the 21st century, and as part of a specifically South African paradigm shift.

## 7.3 FINDINGS

After careful analysis of the literature, the researcher observed the following:

### 7.3.1 Music Education in South Africa

In 1994 a paradigm shift was imminent, not only in South African government but also in education. The new government had to redress, renew and restructure education in the country. A shift from content-based to outcomes-based education became imperative. These comments lead the researcher to this final point. Music Education has crossed some important borders on the journey to the new millennium. Change in music curriculum has brought a trend toward a more eclectic and student-centred curriculum, with the result that a strict adherence to a particular 'methodology' is occurring less than at any previous time. There has also been a general questioning of the Western notion of music as a superior and specialised craft. Music in many schools now involves much more than singing, playing and learning to become musically literate according to the Western canon.

One of the most significant achievements of Music Education during the past decade is that students around the world are now required to think and act in ways that are quite different from the traditional approaches of the past. There is also a healthy recognition that music as it is currently being practised should be a compulsory subject.

Elliott reminds people:

> 'Our' traditional Western music-making and listening practices share several idiosyncratic features: they pivot on syntactical structures (tonal melodies and functional harmony); they value re-creation over spontaneous creation; and they emphasise control of musical environments. The Western view tends to treat all music as an aesthetic object of contemplation according to 18th century standards of taste and sponsorship (Elliott 1989:13).

Walker extends this view when he argues that people simply cannot fit sounds from outside Western traditions into Western art music paradigms "without insulting and destroying their integrity, as well as implying that we in the West have developed the art of music to higher degrees of sophistication than others because of our technology and culture" (Walker 1996:9). The word 'music', as Walker (1996:8) contends, "is as culturally laden with Western traditions of the last several hundred years as is the term 'gamelan' with Balinese traditions". The researcher is of the view that South Africa, as a multicultural society, must approach music with the view that it is embedded in peoples' cultures.

Music education is a lifelong process involving students at all levels. Music is an academic subject with its own special body of knowledge, skills, and unique ways of knowing and thinking. It offers unique opportunities for reactivity and self-expression. Musical knowledge and skill need to be developed and nurtured. Further study is needed to determine how children learn music, what developmental levels are optimal for emphasizing various skills, what experiences students should have, and what techniques should be used.

The curriculum's best design is needed to explore questions such as the following:

- What are successful materials, techniques, and settings that motivate students to participate in general music and ensembles?
- What are effective techniques that help students acquire music knowledge and skills?
- What is the importance of early experience in the musical development of children? Are there developmental windows of opportunity for learning certain music skills or attitudes?

- What music learning experiences are good precursors to continued music participation beyond the school years?

Social issues, changing demographic patterns, and inclusion of African music in the music classroom present significant challenges for music education. The fact that today's music educator must be prepared to teach diverse and underserved populations underscores the need for examining the best methodologies, techniques, conditions, and materials for bringing music to the entire student population in the nation's classrooms.

### 7.3.2 Outcomes-based education

Outcomes-based education does offer many powerful ideas, such as a commitment to learning for all students, possibilities for authentic assessment, and interest in an integrated curriculum. Some schools have been trying these ideas independently of OBE, however. The complexity of schools as human systems, the question of power or the ownership of the reform process, and theoretical questions about the nature of knowledge and learning remain significant problems. These issues require more study. In addition, we need more examination of mastery learning, competency driven curriculum, and OBE theory; more of the OBE implementation efforts in a variety of school settings; and more long-term research on OBE classrooms.

This study has suggested some areas of concern and reasons for scepticism in the face of ongoing advocacy of outcomes-based education with particular reference to Music Education. Outcomes-based education starts with given generic procedures developed by outsiders rather than the concerns, needs and commitments expressed by educators, students and parents in their own situations. Outcomes-based education depends on more detailed curriculum and assessment, stronger management, and greater effort by school people. Like previous failed reform efforts, OBE has been offered as a dependable, rational, scientific panacea.

The researcher discovered that despite the criticisms levelled against Outcomes-based education, OBE seems to be radical reform, a true paradigm shift in the South African education system. To view schools as complex, living systems

affected by larger social and economic forces rather than as simple mechanisms easily overhauled is radical. To shift power relationships and approach reform democratically is radical; to adopt a new and consistent philosophy of learning is radical.

### 7.3.3 Technology-based Music Education

With the imminent arrival of satellite technology in Africa and South Africa in particular, the problems of expanding the telecommunications network to remote areas could be leapfrogged and put South Africa firmly on the grid of global communications. The South African education system has long carried the blame for the lack of computer literacy, but these initiatives might still work to empower the school children of today for the wired working environment of the future.

Compounding the impact has been the source of music teaching. With cutbacks in school programmes, teaching has often moved from the classroom to a private studio, a backyard garage, or a personal computer, as many of today's aspiring musicians have found alternate sources for their education. Student music capabilities/background vary due to years of uneven self-teaching and reliance on less formal playing opportunities found in pick-up groups. The impact of evolving music technology cannot be underestimated. While the music synthesizer, integrated with the personal computer, has made it easier for the music student to compose, arrange, and hear music without need to assemble a full orchestra, it has imposed new financial and training requirements to acquire and understand the technology itself. To some this will appear to be a distraction from the art of music. To others it will open new avenues of opportunity for creativity. Thus, this research study finds that technology-based Music Education forms part pf the restructuring mechanism of Music Education curriculum in South Africa.

With many of these changes has come an accompanying decline in traditional skills such as reading and writing music. Students are often involved with music where sounds rather than symbols are the medium of exchange. This is often noted as tapes rather than charts. Especially for secondary music programmes, it means a

need to restructure programmes that fit the interests of today's students if they are to remain relevant and attractive enough to elicit public support.

Many of today's students themselves are from non-Western cultures. This increasing cultural diversity presents a challenge to institutions to widen their music and cultural horizons. Paul Simon's Graceland album notably introduced sounds and rhythms from other cultures, increasing understanding and appreciation for African cultures and at the same time making it imperative for secondary music programmes to reflect the new demographics within the society.

Technology is effectively revolutionising South African society. An unexpected by-product of this revolution has been the emergence of a generation of learners weaned on multidimensional, interactive media sources, a generation whose understandings and expectations of the world differ profoundly from the generation preceding them. If teachers are to give these children the education necessary to succeed in today's technologically intense, global future, a new form of education practice, one that builds on children's native learning abilities and technological competence, must replace the existing methods. Only by revising educational practice in the light of how culture has changed, can people close the gap, and reunite schools with learners and the rest of the society.

In language education, for example, current practices do not advocate starting with 18$^{th}$ century English. Learners study language starting from their own usage, and go on to develop understanding and appreciation of the language use of others, including other times and places and eventually the works of masters of language. Music pedagogy for all students, rooted in the 20$^{th}$ century and leading to other times, places and cultures, utilising digital technology in the form of acoustic synthesis, sequencing, CD ROM and 'on line' access to the vast store of examples and information available world-wide is, in this case, the only way forward.

But the lead must come from the universities and music colleges in South Africa; otherwise schools will face the uncomfortable situation of square pegs, that is to say music educators with historically and pedagogically irrelevant musical skills

and knowledge, trying to fit into the round holes of pedagogy with which they have no professional or scholarly connection.

The impact of computer and software technology in Music Education at school level is important for teaching students to use and create teachingal software. Courses in Early Experiences in Music Education, Basic Music Skills, Music History, Music Notation and Printing, and Music Technology can all play an important role in preparing music educators for different schools in South Africa.

Learners need the skills necessary for satisfactory course performance, but they must also learn how to use computers and software for course teachings. Transformation of education and music in particular, offers a lucid framework to develop course teachings that integrate the use of technology and the nature of true interactive teachings and implementation. Graphics and video capabilities are constantly improving, as are Internet resources for the teacher.

### 7.3.4 Integrated approach to Music Education

The researcher recommends that Music Education be presented in an integrated approach where the conceptual framework (the use of Music Education concepts to enhance learning) of music is the focal point. This approach helps the teacher to coordinate musical activities to promote holistic learning in students. All aspects of Music can be taught as a whole, which then forms a discipline of knowledge. In this case, integration helps to:

- Enhance learning transfer;
- Offer better understanding of each discipline in the global education of the learner;
- Better learning results;
- Facilitate the development of thinking skills;
- Make students aware of the significance of what is being taught.

In consonance with the above points, Omibiyi (1999) strongly noted that the idea of integrated music curriculum embodied in the concept of culture to form part of Music Education is relevant to Africa, where music is inextricably bound to the religious and social life of the people.

### 7.3.5 Theoretical framework

This research study proposes an approach to constructivist design that makes interpretation and construction of authentic artefacts in the context of rich background materials the central focus. This will entail the use of major paradigms in Music education which provides frame of reference from which music is built. Thus therefore, theoretical framework builds a relevant philosophy. It has shown how this approach can be applied to study Music Education and programmes in widely different fields of study - namely, history, science and literature. The research has also shown that in addition to learning specific content, students using these programmes acquire generalisable interpretation and argumentation skills. This constructivist design framework is useful both for guiding design and producing valuable learning results.

Conclusions are reached by postmodernists and critical theorists as diverse groups of thinkers who point out the limitations and social situatedness of reason and science and thus argue that modernism has or should come to an end. Despite their basic agreement on the negative results of modernism, postmodernism and Critical Theory are critical of each other. Critical theorists such as Habermas hope to reform or repair the misapplications of rationalism and empiricism begun in the Enlightenment. Postmodernists, pointing on the other hand to the 'breakdown of modernity', wish to 'deconstruct' the absolute and objective truth claims of reason and science in favour of other ways of understanding, guiding and empowering human action. Critical theory, in sum, seeks to recognise (i.e. re-organise or re-think) human subjectivity and individuality as both a means and an end of becoming fully human, fully rational. This means that if knowledge is to be valid, it must take into account subjective, contextual, situational factors. Humans are 'subjectivities' with goals, needs and intentions, not simple 'objects' controlled by

natural laws. They have reason and therefore can formulate and evaluate personal and collective purposes, goals and values (i.e., they have intentionality).

### 7.3.6 Curriculum for musical praxis

The curricular problem of "**what**, of all that can be taught, is most worth teaching?" is a matter of determining the most accessible pragmatic "goods" (values) that music can provide for the greatest number of people. A pragmatic answer to this over-riding curricular question rejects, first of all, metaphysical issues that cannot be adjudicated in concrete terms at all, or issues that do not stand up well to the process of immanent critique. Thus it does not involve fine and noble platitudes and claims about the aesthetic benefits of music that cannot be evaluated in terms of teaching success or in terms of benefits of the lives of individual students.

To be successful, curriculum cannot succumb to the legitimation crises created by the use of aesthetic theory and its claims of "aesthetic disinterestedness", "aesthetic distance," and "for-its own-sake" kinds of musical purity, while at the same time claiming that Music Education as aesthetic education is somehow basic in a pragmatic, useful sense to general education. Thus, a pragmatic curriculum - a curriculum for music as praxis - will not reflect the kinds of aesthetic claims that involve the increasingly problematic legitimation crisis concerning elitism versus populism - good taste versus popular tastes and the resulting problem of students who are increasingly turned off to the kinds of "good music" that alone are said to have appropriate aesthetic benefits.

A curriculum, then, is an articulated and functional arrangement of such action ideas for guiding teaching praxis in the same way a score guides certain kinds of musical praxis. A written (formal) curriculum for music thus involves hypothesizing action ideas that analyse and represent desirable, optimum states of musical functioning. It describes in holistic terms the "good results" ethically expected from a teacher's praxis (or from each individual among a group of teachers following an agreed upon curriculum) and from the curriculum itself. To be praxial, such holistic results must be "authentic" and thus capable of being put

into action both in the classroom and "in life". A delivered curriculum (curriculum as "instructed") can never fully satisfy or reach these optimum states. But, in teaching as praxis, the effective curriculum amounts to the actual results in terms of musically praxial for individual students.

In this critical view, then, the process of teaching based on delivering a formal curriculum is necessarily distinguished from teaching as a praxis that results in an effective curriculum. In the first place, a formal curriculum will be incapable of supporting effective curricular results if improperly conceived or written. And, in the case where appropriate formal curriculum is used to organise and guide teachings, teaching is seen only when such teachings (i.e., methods, materials, evaluation, etc.) are effective in terms qualified by the curriculum. Teaching, thus redefined pragmatically and critically, always benefits by being drawn and inspired in the direction of such optimum results, and is judged and changed over time by using such action ideas as criteria for improvement.

Any consideration concerning action ideas for curriculum, in sum, is a philosophical undertaking. When it includes a group of teachers planning curriculum together, it also requires 'critical argumentation': the ability first to 'critique' an issue, contention, assumption or problem in terms comprehensible to all, then to argue (in the best professional sense) and communicate successfully the fruits of that critique in the direction of increased empowerment of all concerned. Teaching then is not the simple use of a technology or tools; it is the praxis of realising effective results for students for life. The standards of effectiveness for teaching praxis are indicated by the action ideas of formal curriculum, conceived in terms of empowering students to music as praxis. Such standards for praxis become common standards when they are conceived collectively by all those in a community charged with instructing students. However, there will be no standard practice or technology for reaching the common criteria of the formal curriculum.

It has become apparent from this research study that students need a coherent education that takes a holistic view of curriculum and of learning an makes connections between all of the Music Education curriculum components and the real everyday world of students. It is possible to create a comprehensive curriculum

using some or all of the ideas mentioned in this thesis. Some of the areas can be divided into a series of electives. Schools can offer separate electives to students or incorporate them into the existing music curriculum and this should be guided by the Arts and Culture Learning Area. The appropriate materials for the curriculum can be selected from a wide variety of options and it is easy to modify and add activities as needed. The electronic keyboard/computer lab offers a medium that can significantly enhance music learning.

## 7.4 CONCLUSIONS

In conclusion, music educators can face the challenge of Outcomes-based learning with confidence. South Africa's knowledge of skill development stands music educators in good stead, and leads them toward the outcomes contained in the National Curriculum Statement in which they are always referred to. In order to achieve this, they must rely on approaches to Music Education which allow for knowledge, skills and concepts to be demonstrated actively and creatively. Engaging the learners in authentic musical experiences, based on the philosophies of music educators as discussed in Chapter 3, as well as African philosophy, will assist them in achieving their musical outcomes.

An outcomes-based education format has already been incorporated in Music Education courses, moving South Africans closer to their marginalised African, Indian and Coloured music. This symbolises a radical pruning of the traditional merely Western theory of music. This not only will allow more time for in-depth study of music, but will also allow students to complete the basic music theory sequence in a balanced manner.

The preparation of music educators has to be expanded to focus on the following areas:

- developing skills in producing and controlling sounds that are electronically modified/synthesized
- developing an understanding of the principles of sound synthesis, with an emphasis on aesthetics and expressive applications; and

- providing practical experiences in the use of technology in teaching, record-keeping, composing, scoring, arranging, band charting, and management.

This will then enable students to achieve the following outcomes:

- communicate effectively
- solve problems using a variety of strategies
- take responsibility for oneself and for one's role within a group
- develop self-discipline
- work as a responsible member of a team
- become aware of one's own culture and the cultures of other peoples.

These outcomes reflect the spirit of Curriculum 2005. Learners will achieve these outcomes as a result of a quality Music Education, provided by well-trained educators. Music educators should have an easy task in incorporating outcomes such as these into the foundation of their planning. Outcomes-based learning may actually legitimise and give more weight to our raison d'etre as music educators.

One of the strengths of music educators should be the emphasis on fostering the skills, knowledge and concepts necessary to experience and perform music. The sequential building bricks of musical understanding develop in an integrated melange of rhythm, melody, form, harmony and timbre. It is through these enabling outcomes that the learner achieves the national and any global outcomes mentioned in this study.

Demonstration of the knowledge, skills and concepts that have been gained is a focal point in Outcomes-based learning. A variety of demonstrations are encouraged, as is a multiplicity of demonstrations of each outcome. Experiential music programmes incorporate a multitude of opportunities for demonstration of enabling outcomes. As an example, learners in an Orff programme are actively engaged in singing, speaking, reading music, moving, listening, playing instruments, composing and improvising. All these musical activities provide vehicles for demonstrating achievement of outcomes.

The clear demonstrations of outcomes allow for accountability in assessment, and therefore, the degree of acquisition of knowledge and skills are clearly observable. Both learner and teacher can measure whether a child sings in tune, reads a rhythm, identifies a rondo, or plays an ostinato. With this clarity of assessment, there are signposts indicating which skills and concepts need reinforcement.

## 7.5 RECOMMENDATIONS

It is recommended that South Africa should learn from other countries which have already implemented OBE systems, in this case Australia, New Zealand, Canada, England and to a lesser extent Ghana and Uganda. Transformation of the mindset of teachers is crucial in the implementation of OBE, Curriculum 2005 and its recent National Curriculum Statement.

With regard to Music Education, a curriculum framework is highly recommended which will guide planning and ensures consistency in programme formulation. Therefore, integrated arts education can be designed from the Arts and Culture Learning Area to address Music Education at the Foundation phase, but develop to an elective subject as the learner progresses.

Central to Music Education is the writing of transformational outcomes, which then give critical outcomes of music. These critical outcomes underpin the writing of learning outcomes and proposers of unit standards and qualifications will need to show how these are developed within each standard/qualification. These will enable general knowledge, skills, attitudes and values necessary for learners to cope with lifelong learning.

To achieve this, there is need for drastic review of, and adjustment in approach and method of music education at all levels in South Africa. A favorable environment should be created for appropriate and rapid growth and development of music and musical practices. The number of tertiary institutions offering music as a course should grow up to at least, fifty percent of the total number of higher institutions in South Africa. Students in the secondary schools should be encouraged to study music and possibly sit for the final music exams at grade 12 level. The researcher

would like the South African government to provide adequate funds for infrastructure, equipment, instruments, well-qualified staff, and other facilities that will enhance music education at all levels including the unfolding of OBE as an approach to music. The music curriculum content should be restructured to:

- provide more balance for music types in the society.
- reflect the needs and aspiration of national development
- reflect the standards of international musical academics.

It is further recommended that Music Technology be taken seriously when implementing the new curriculum in schools. Music Technology allows the field of study to spearhead the transformation process in education because it is current, relevant, provides access to all learners interested in this field, is outcomes-driven and is rooted in life roles and lifelong learning.

## 7.6 STRATEGIES FOR THE IMPLEMENTATION OF MUSIC EDUCATION

The following strategies are recommended:

For music education to have an impact on or benefit for the average learner, Lehman (1993:205-207) states eight requirements that need to be addressed:

- Every primary and secondary school must offer a comprehensive, balanced, sequential, high quality programme of music teaching, taught by qualified educators. These should, ideally, be specialist teachers assisted by generalist teachers.
- Objectives for music teaching should be explained in simple and clear language, stating what the pupils should know and be able to do, and bypassing "esoteric jargon".
- Minimum expectations for the various levels of achievement in music should be clearly outlined, avoiding vague descriptions and foggy rhetoric.
- Music learning must be based on skills and knowledge, and the idea that music is only fun and games or serving the aim of entertainment must be