Chapter 5

BRAIN PROFILES AND PERSONALITY TYPES

> The human brain is a meaning-maker and meaning seeker. The more important the meaning, the greater the attention one must pay in order to influence the content of the meaning (Jensen 2007).

5.1 Introduction

Thanks to the human brain, literature regarding the brain and brain profiles has developed, indicating that different individuals have strengths and weaknesses in terms of their preferred functioning. Brain profiles therefore link with students' and teachers' personality types, although the two aspects of human functioning can be clearly distinguished, as will be discussed further in this chapter.

The left and right hemispheres of the human brain process information differently, as displayed in figure 11 (Outlook School Division 2001).

Figure 11: The different processes of the human brain

Most people have a dominant hemisphere or largely operate in one of the two hemispheres. This dominance affects personality, abilities and learning style. Teachers for instance should design music lessons in such a way that they include activities that are directed at both hemispheres, deal with concepts both verbally and visually and discuss music concepts both logically and intuitively (Outlook School Division 2001).

Figure 12 captures how the two hemispheres of the human brain function differently (Outlook School Division 2001).

Figure 12: Left and right hemisphere functions of the brain

LEFT HEMISPHERE FUNCTIONS	**RIGHT HEMISPHERE FUNCTIONS**
Connected to right side of the body	Connected to left side of the body
Integrates many inputs at once	Deals with inputs one at a time
Processes information in a linear fashion	Processes information more diffusely and simultaneously
Deals with time	Deals with space
Responsible for verbal expression	Responsible for gestures, facial movements and body language
Responsible for arithmetic operations	Responsible for relational and mathematical operations
Specializes in recognizing words and numbers	Specializes in recognizing places, faces, objects, and music
Does logical and analytical thinking	Does intuitive and holistic thinking
The seat of reason	The seat of passion and dreams
Crucial side for wordsmiths and engineers	Crucial side for artists, craftspeople, and musicians

The researcher agrees that formal education systems still tend to emphasize a rather narrow range of brain capabilities (Holistic Teaching and Learning 2006). The reason for supporting Ned Herrmann's whole-brain model is because of the scope it offers for viewing students' brain profiles holistically, yet being aware of the individual qualities of the four quadrants. These possibilities offer an open-

endedness in teaching pupils creatively and they give the teacher scope, in teaching, to function with flexibility.

In Ned Herrmann's whole-brain model, where the brain is seen in four quadrants (see figure 9 under 4.6.1), each quadrant displays distinctive strengths. These four quadrants are not a literal map of the anatomy of the brain, but do reflect the ways in which different physical locations inside the skull specialize in different ways of processing information. For example, in most people the areas that handle speech and verbal logic functions do lie behind the left ear. Hippocrates already noticed that when soldiers were brought to him who had been struck in the left side of the head, they often lost the power of speech, but the same wound on the right side did not produce this result (Gross 2008:1).

In order to better understand pupils, it is necessary for teachers to be aware of these areas of strength in their brains as well as their personality types. This can lead to more effective perception and teaching strategies. Jensen (1996b:6) emphasizes the importance of effective teaching in the following statement: "When teachers design learning around basic principles of how the brain learns, motivation and meaning increase for all learners".

5.2 **Overview of different areas of the human brain relevant to learning**

The author deems it necessary for the purpose of the study to discuss the general areas of the brain briefly and thereafter focus more on the parts relevant to learning.

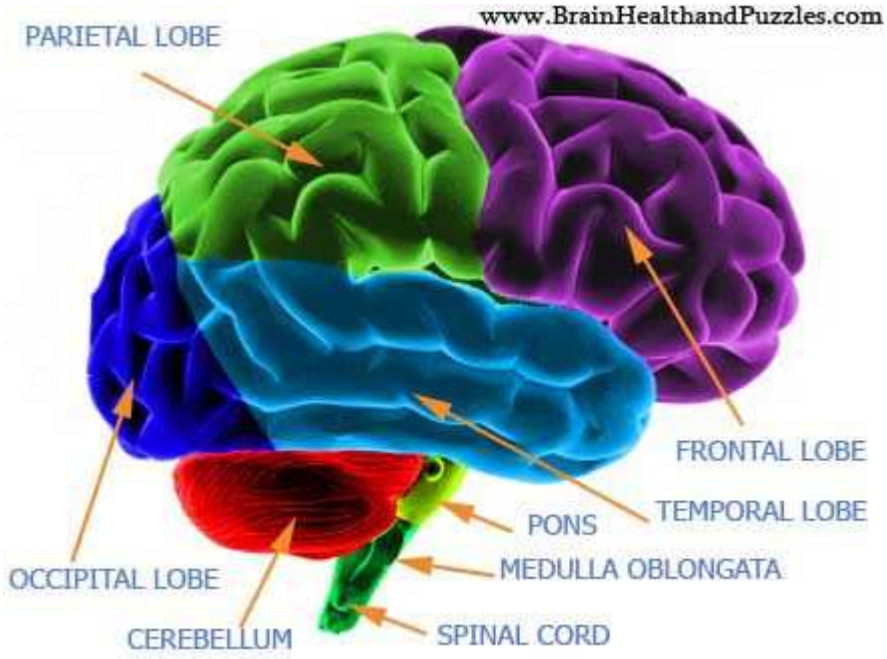
5.2.1 **Cerebrum**

The cerebrum (technically referred to as the Telencephalon) is divided into two hemispheres (left and right), each consisting of four lobes (frontal, parietal, occipital and temporal) (Brain Atlas 2006). The two hemispheres interact very

closely via the corpus callosum and the information exchange between the two hemispheres is maintained in as short a time as ten milliseconds (Altenmüller et al 2000:100).

The cerebrum is composed of a number of sub-regions as seen in figure 13 below (Looi 2008).

Figure 13: The sub-regions of the cerebrum



The cerebrum is the largest part of the brain and contains white[45] and gray[46] matter. In humans it surrounds older parts of the brain. Limbic, olfactory and motor systems project fibres from sub cortical (deeper) areas of the cerebrum to parts of the brainstem (Telencephalon 2007).

---

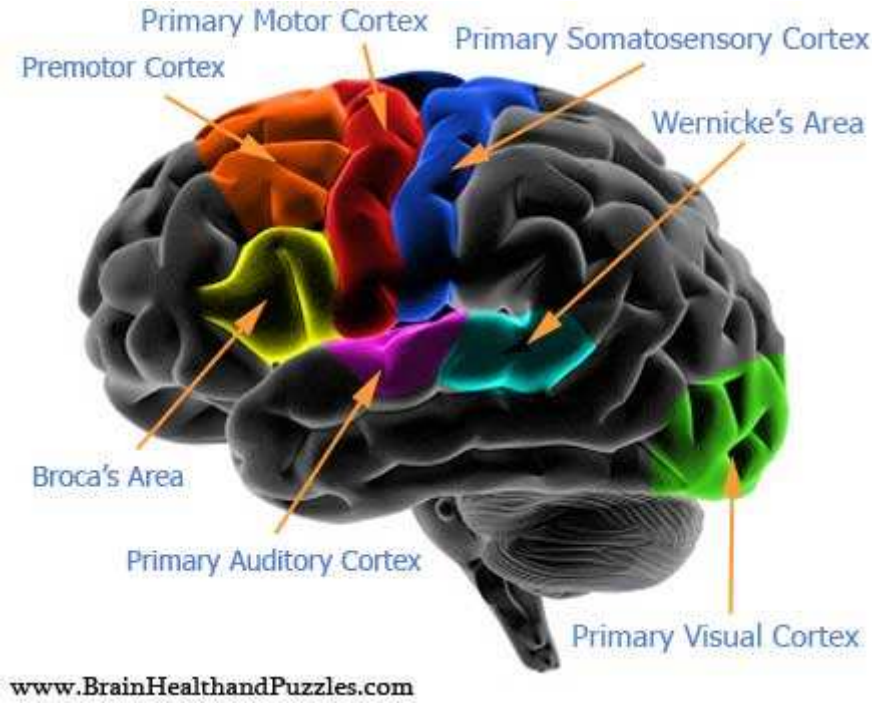
[45] A portion of the nervous system composed of nerve fibers enclosed in myelin sheaths which contribute a white coloration to otherwise grayish structures. The inner portion of the cerebrum is composed of white matter (Corsini 2002:1070).

[46] Gray matter is cell bodies of neural tissue. It occurs in masses of cell bodies in the spinal cord. The outer layer of the cerebrum – the cerebral cortex and areas deep within the brain – the basal ganglia, are made up of gray matter (Corsini 2002:423).

5.2.2 **Cortexes in the brain**

The cortexes are the outermost layer of the brain, 2-4 mm thick and playing a central role in many complex brain functions including memory, attention, perceptual awareness, thinking, language and consciousness (Cerebral cortex 2007; Altenmüller et al 2000:99). Figure 14 indicates the different cortexes within the brain (Looi 2008).

Figure 14: The different cortexes within the brain



The outer covering of the cerebral hemispheres is known as the cerebral cortex. This is the most evolved portion of the brain, and it regulates the most complex behaviour. Each cerebral hemisphere is divided into four lobes. The occipital lobe of the cortex, located at the back of the head, receives and processes visual information. The temporal lobe, located roughly behind the temples, is important to the sense of smell. The parietal lobe, which is on top of the temporal and occipital lobes, receives sensory information, in the sensory projection areas

from all over the body. This lobe figures in spatial abilities. The ability to comprehend language is concentrated in two areas in the parietal and temporal lobes (Pearson Education 2000).

The frontal lobe is part of the cerebral cortex responsible for voluntary movement and attention as well as goal orientated behaviour. These four lobes are both physically and functionally distinct. Each lobe contains areas for specific motor sensory function as well as association areas which process a variety of information (Pearson Education 2000).

Jensen (2000:12) notes that familiar music selections activate Broca's area (located in the left hemisphere), suggesting that all familiar sounds, not just word sounds, may be processed in this area. Through his research Jensen explains the following interesting findings:

- Rhythmic patterns activate Broca's area and the cerebellum
- Harmony activates the left side of the brain, more than the right, as well as the temporal cortex
- Timbre activates the right hemisphere. This is the only musical element that does
- Pitch activates an area of the left back of the brain called the precuneus. Another area involved may be the right auditory cortex
- Melodic patterns activate both sides of the brain (Jensen 2000:12).

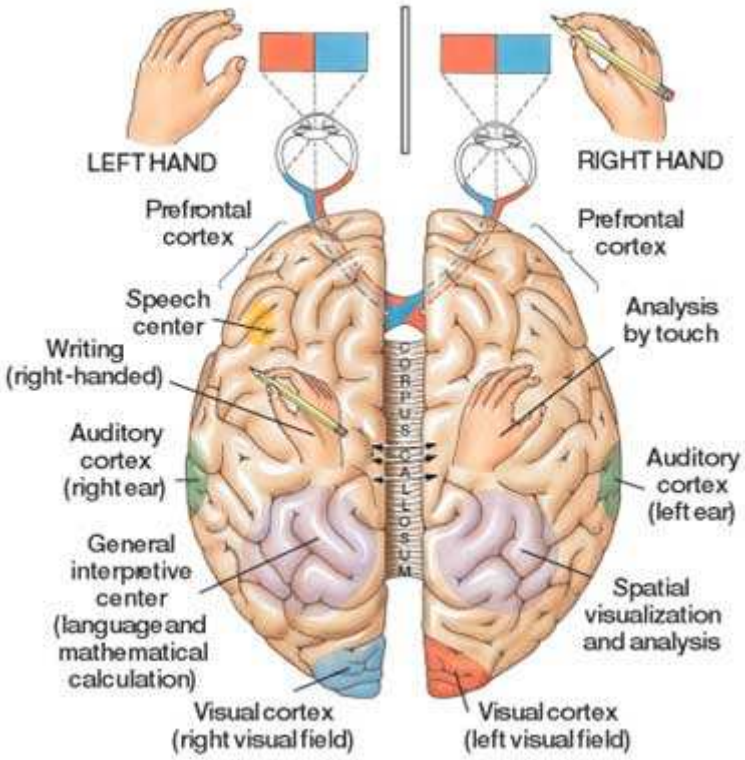
Jensen concludes that these findings suggest that music is not exclusively a 'right-brained' activity.

As mentioned earlier, the two hemispheres of the cerebral cortex are linked by the corpus callosum, through which they communicate and coordinate. The right hemisphere of the cortex excels at nonverbal and spatial tasks, whereas the left hemisphere is usually more dominant in verbal tasks such as speaking and

writing. The right hemisphere controls the left side of the body and the left hemisphere controls the right side (Pearson Education 2000).

Figure 15 illustrates the cerebral hemispheres (Pearson Education 2000).

Figure 15: The cerebral hemispheres



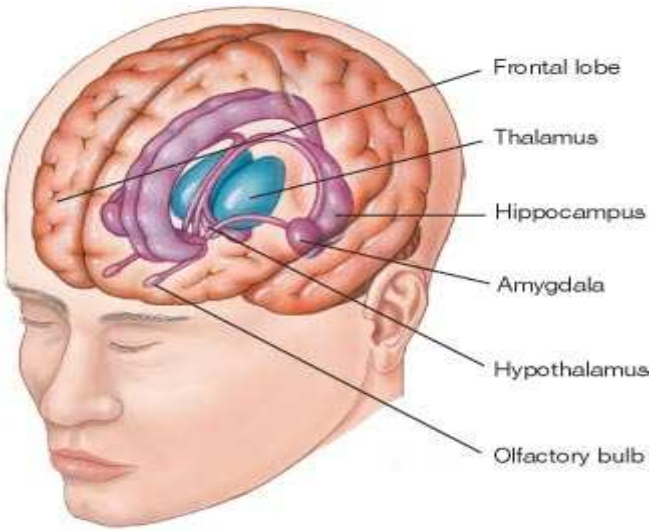
5.2.3 **Limbic system**

The limbic system is not a structure, but a series of nerve pathways incorporating structures deep within the temporal lobes. Forming connections with the cerebral cortex and other areas of the brain, the limbic system is involved in the control and expression of mood and emotion (Brain Atlas 2006; Bruckner 2005:6; Limbic System 2007). Thus the limbic cortex forms a broad circular strip/band stretching from the brainstem to the cerebellum, interacting with the four lobes of the cerebrum (Jordaan and Jordaan 1998:175). The limbic system also includes

many different cortical and sub-cortical brain structures interacting with an extensive list of brain regions (Limbic System 2007). Some of these regions include the hippocampus and amygdala, as well as other structures. It appears to play a central role in times of stress (Pearson Education 2000).

Figure 16 shows the limbic system (Pearson Education 2000).

Figure 16: The limbic system



5.2.4 **The internal structures of the brain**

Following are short descriptions of the internal structures of the brain related to music, perception, teaching and learning. The limbic system will not be mentioned here as it was discussed under 5.2.3.

5.2.4.1 **The Hindbrain**

The Hindbrain or reptilian brain is the oldest part of the human brain, a piece of brain anatomy that is shared with reptiles, and is the most primitive. It is in charge of primal instincts and most basic functions.

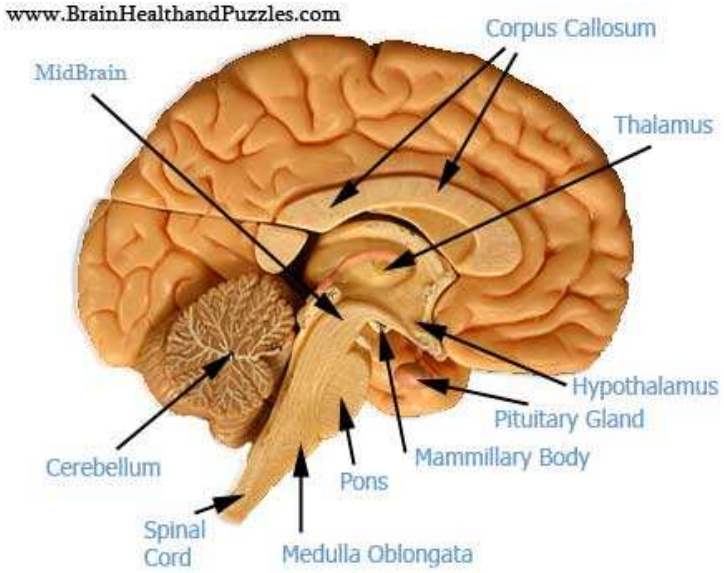
The two areas grouped under the hindbrain relating to music are the pons and the cerebellum. The pons relays sensory information to/from the brain and is also involved in controlling autonomic body functions. The cerebellum on the other hand mostly deals with regulating and coordinating movement, posture and balance (Looi 2008).

5.2.4.2 **The Neocortex**

The neocortex is also known as the rational brain. It is a greatly advanced part of the brain and it is in this area that brain power is found to develop language, abstract thoughts, consciousness and imagination. The neocortex is divided into the two hemispheres as fully discussed in the introduction to this chapter. It is this area of the brain that contains the four lobes and the corpus callosum discussed under 5.2.2. Broca's area is the part of the cortex that controls speech, language recognition and facial nerves (Looi 2008).

In figure 17 the various internal structures of the brain are shown (Looi 2008).

Figure 17: The internal structures of the brain



5.3 Whole-brain learning and teaching

Whole-brain learning uses techniques that integrate the synthetic and imaginative brain skills with the analytical and language skills. Simple strategies can make better use of the whole-brain and can dramatically improve learning (Holistic Teaching and Learning 2006). Gross (2008:2) comments that understanding the four quadrants of the brain and whole-brain learning are important for the following two reasons:

- The most important challenges teachers and pupils face require the use of capabilities from all four ways of thinking.
- The mental health of human beings in general depends on using the whole brain.

Brain-based learning is the purposeful engagement of strategies based on neuroscience. It is the application of a meaningful group of principles that represent teachers' understanding of how the brain works in the context of education (Jensen 2007).

Both emotional and body states influence attention, memory, learning, meaning and behaviour. These states become more stable over time and will resist change. For example, the longer one is angry or depressed, the more comfortable one becomes with that state. This has profound implications for the social and behavioural roles of education (Jensen 2007).

Brain-based learning is not a magic term that can solve all of education's problems. Anyone who represents that to others is misleading them. There is not yet a "one size fits all" brain-based programme, model or package for schools or individual teachers (Jensen 2007).

5.4 Out-of-the-box thinking and teaching

Out-of-the-box thinking and teaching suggest that teachers should be aware in general of certain unfixed ways in teaching music students. This is necessary because no two students are alike in brain profiles. Other aspects that need to be taken into consideration are differences in learning styles and Multiple Intelligences as discussed in other chapters of this thesis. Apart from these, the student will perceive explained information in his/her own way and it is important that teachers are clear in recognizing that the student perceived in the way the teacher meant.

There must thus be certain flexibility allowed from the teachers' side towards students. As discussed above (Coil 2000:10), flexibility means allowing for differences in such things as:

- Learning styles
- Learning modalities
- Strengths/weaknesses in Multiple Intelligences
- Pace of learning and lesson presentation
- Time needed to complete a task
- Student interests
- Ability levels.

This list is by no means complete, but gives suggestions for aspects teachers need to be sensitive to in the teaching process.

A brain compatible teacher is one who understands holistic teaching and uses strategies in a purposeful way: an educator who understands the reasoning behind his/her teaching. Such a teacher also stays constantly updated through continuous professional development.

Evidence suggests that stress is a significant factor in creativity, memory, behaviour and learning. Teachers who effectively manage stress factors

(purposefully decrease or increase stress) in class are likely to experience a positive classroom environment. There are many ways to decrease stress in the classroom, such as integrating stretching exercises and teaching coping skills (Jensen 2007).

5.5 Personality types

> Whatever the circumstances of your life, the understanding of type can make your perceptions clearer, your judgments sounder, and your life closer to your heart's desire (Briggs Myer 2007a).

In order to approach pupils holistically, it is necessary to study personality types and all the aspects and terminology that this concept entails.

5.5.1 Understanding the terminology

In psychology, personality is a description of consistent emotions, thought and behaviour patterns in a person (Personality 2007). The term personality type refers to the psychological classification of different types of people. Personality types are not the same as personality traits[47], which come in different levels or degrees. According to the type theories, there are two types of people, introverts and extraverts[48]. Trait theories, introversion and extraversion are part of a continuous dimension, with many people in the middle. Trait theorists often use the term 'type' to describe someone who scores exceptionally high or low on a particular personality trait, but as described above there is a small distinction between the terms type and trait (Personality_type 2007).

Understanding temperament is also of importance at this point. Temperament is the innate aspect of an individual's personality, such as introversion or

---

[47] Traits refer here to a characteristic feature, attribute, mannerism or quality part of a personality type (Collins et al 2006:789).

[48] Term and spelling coined by Jung; the variant 'extrovert' is not preferred (Analytical_psychology 2007; Roper 2007).

extraversion. It is defined as that part of the personality which is genetically based. Along with character, and those aspects acquired through learning, the two together are said to constitute personality (Temperament 2007).

The idea of psychological types originated in the theoretical work of Carl Jung[49] (Personality_type 2007). In order to study the personality types as formulated by Jung it is also important to be aware of the work of his contemporary, Sigmund Freud[50], although these leading figures are not discussed fully within the framework of this thesis.

5.5.2 **Carl Jung's eight personality types**

When attitudes and functions are combined, eight personality types can be distinguished on the basis of the dominant attitude and function. Jung insisted that he did not want to categorize people rigidly with his typology. Rather, the typology should be viewed as a framework according to which individual psyches can be distinguished from one another, based on their preference for channelling psychic energy. The eight personality types are described as follows (Meyer et al 2003 112-113):

- Extravert-thinking: This type of person lives to fixed, objective rules and subjective feelings are repressed.
- Extravert-feeling: A person in this category is emotionally highly labile and emotions fluctuate as situations change.
- Extravert-sensing: The individual here is characteristically highly pragmatic and realistic and accepts life as it is without thinking too much about it.

[49] Carl Gustav Jung (1875-1961) was a Swiss psychiatrist, influential thinker, and founder of analytical psychology (Carl_Jung 2007).

[50] Sigmund Freud (1856–1939) was a Jewish-Austrian neurologist and psychiatrist who co-founded the psychoanalytic school of psychology (Freud 2007).

- Extravert-intuitive: Such people are always looking for something new and find it difficult to sustain anything – ideas, jobs or relationships.
- Introvert-thinking: People with this type of personality are highly intellectual and care little about their day-to-day existence.
- Introvert-feeling: These personality types are intensely emotional and hypersensitive.
- Introvert-sensing: The individual in this grouping takes life as it comes without displaying great social involvement.
- Introvert-intuitive: This personality type includes eccentric daydreamers who generate new ideas based on 'visions'. They tend to be highly impractical and asocial, and other people often do not understand them easily.

According to Jung, a personality type can be identified only when the relative strength of psychic attitudes and functions have been ascertained through long-term analysis and therapy. He also points out that attempts to change an individual's personality type can lead to neurosis (Meyer et al 2003:113).

5.5.3 **The importance of personality type towards understanding transformative learning**

Transformative learning involves the process of reflection in how choices and identifications are made in order to understand what assumptions are involved in held beliefs (McWhinney and Markos 2003:21). Relating to personality types Cranton (2009) asserts that personality preference serve as a 'filter/lens" for teachers in how they view themselves, others and the world. The Jungian approach to personality types is held by Cranton (2009) in that she views Jung as a constructivist in philosophy, which harmonizes with transformative learning theory. This belief is supported by McWhinney and Markos 2003:20).

Jung's theory of personality suggests that the whole self is developed – moving from a general, collective psychology to a more individual approach. This process is called individuation and is a life long, constant process of finding one's self (Cranton 2009).

Teachers and students can be affected by transformative learning in aspects such as brain quadrant dominance and approaches that differ from abstract theorization to concrete literal thinking. These approaches will have an influence on students' ability to learn, whether both the student and teacher are/are not introverted or extraverted in personality type (Mezirow 2000:191).

The educator's role in fostering transformative learning involves helping bring the consequences of taken-for-granted assumptions into critical awareness so that appropriate action can be taken (Mezirow 2000:195). Mezirow (2000:197) suggests three distinct, yet interrelated roles for educators:

- Educators have a responsibility to assist learners in becoming aware of their psychological preferences.

- Educators have to play a role in fostering critical questioning of psychological habits of mind.

- Psychological preferences influence the way reconstruction of frames of reference is reached. In this regard educators need to help create learning experiences that involve learners of different predispositions in that process.

Helping students become fully aware of their personality types assists them in seeing their strengths, their blind spots and their prejudices against others different than themselves (Mezirow 2000:196).

5.6 Myers-Briggs Type Indicator

In developing the Myers-Briggs Type Indicator (MBTI) personality inventory, during the 1940s, the aim of Isabel Briggs Myer and her mother, Katharine Briggs, was to make the theory of psychological types, introduced by Carl Jung in the 1920s, accessible to individuals and groups. Most of the original research was done in the 1940s and 1950s. The goal of knowing about personality types is to understand and appreciate differences between people (in the context of the thesis this means teachers and pupils). There is a basic focus on how different individuals prefer and use their perception[51] and judgement[52] (Briggs Myer 2007b). All the types are equal; there is no best type. The MBTI instrument sorts for preferences and does not measure trait, ability or character.

According to the MBTI, types and traits are both inborn. Traits can be improved akin to skills, whereas types, if supported by a healthy environment, naturally differentiate over time. Thus the MBTI is a personality test designed to assist a person in identifying some significant personal preferences (Myers-Briggs_Type_Indicator 2007).

Roper (2007) states that the MBTI is more often used in industrial psychology settings and is regarded as a more popular version of the original Jung personality types. He notes that the Jung version of the personality types is more used within clinical psychological testing and is thus regarded as a more scientific approach to personality styles. However in educational settings, the author regards it as beneficial for teachers to be aware of MBTI basics in order to approach the teaching and learning process holistically. This was determined after a substantial amount of literature was reviewed.

---

[51] Perception involves all the ways of becoming aware of things, people, happenings, or ideas (Briggs Myer 2007a).
[52] Judgement involves all the ways of coming to conclusions about what has been perceived (Briggs Myer 2007a).

5.6.1 **The preferences**

The terms Introvert (I) and Extravert (E) are sometimes referred to as attitudes[53]. An introvert is more interested in the inner world of ideas and draws energy from being alone and having time to think. The extravert prefers the outer world of people and things and uses his/her energy to draw ideas through talking and exchanging views with other people (Myers-Briggs_Type_Indicator 2007 and Roper 2007).

Sensing (S) and Intuition (N) are the perceiving functions. Jung called them the irrational functions, since a person does not necessarily have control over receiving data, but only how to process it once they have received it. Sensing people tend to focus on the present and on concrete information gained from their senses. Intuitive people tend to focus on the future, with a view toward patterns and possibilities. These people prefer to receive data from the subconscious, and see relationships via insights (Myers-Briggs_Type_Indicator 2007 and Saadé et al 2006:543).

Thinking (T) and Feeling (F) are the decision making (judging) functions. They both strive to make rational choices, using the data received from their perceiving functions. Thinking people tend to base their decisions on logic ("true or false" connections) and on objective analysis of cause and effect. Feeling people tend to base their decisions primarily on values and on subjective evaluation of people centred concerns. Feeling people use "more or less, better-worse" evaluations. It could be said that thinkers decide with their heads, while feelers decide with their hearts (Myers-Briggs_Type_Indicator 2007).

---

[53] Attitude is a hypothetical construct that represents an individual's like or dislike for an item. Attitudes are positive, negative or neutral views of an "attitude object": i.e. a person, behaviour or event. People can also be "ambivalent" towards a target, meaning that they simultaneously possess a positive and a negative bias toward the attitude in question (Attitude_%psychology%29 2007).

Judging (J) and Perceiving (P) record how personalities deal with these two dichotomies in dealing with the external world. J types tend to like a planned and organized approach to life and prefer to have things settled. P types tend to like a flexible and spontaneous approach and prefer to keep their options open[54] (Myers-Briggs_Type_Indicator 2007).

5.6.2 **Type dynamics**

The interaction of two, three, or four preferences is known as type dynamics, and when dealing with a four-preference combination it is called a 'type'. In total, there are sixteen unique types.

In each type, all four of the cognitive or mental functions, which are sensing, intuition, thinking and feeling, are present and arranged in a different order. The type acronym is used as a quick way to figure out this order, which is slightly different in introverts and extraverts. An important point to remember is that the first and last letter of the type are used as guides to figure out the order of the middle two letters, which are the main priority (Myers-Briggs_Type_Indicator 2007).

It is not the purpose of this thesis to discuss at length the deeper interactions of these cognitive or mental functions, since it is rather awareness of these various aspects of personality that the author is aiming to convey.

Following is an indication of the 'type table' to show how the MBTI often illustrates the various combinations.

[54] The terminology may be misleading for some – the term "judging" does not necessarily imply "judgmental", and "perceiving" does not necessarily imply "perceptive" in the usual sense of the word (Myers-Briggs_Type_Indicator 2007).

Figure 18: The sixteen personality types of the MBTI instrument (Myers-Briggs_Type_Indicator 2007).

ISTJ	**ISFJ**	**INFJ**	**INTJ**
ISTP	**ISFP**	**INFP**	**INTP**
ESTP	**ESFP**	**ENFP**	**ENTP**
ESTJ	**ESFJ**	**ENFJ**	**ENTJ**

5.7 **Personality and temperament**

Although the author briefly discussed the terms personality and temperament in the section 'understanding the terminology', this section will look more closely at these terms and the theorists that are commonly associated with them.

Personality psychology studies enduring psychological patterns of behaviour, thought and emotion, commonly called an individual's personality. Theories of personality vary between different psychological schools. Trait theories attempt to break personality down into a number of traits, by use of factor analysis[55]. The number of traits varies between theories (Personality psychology 2009). Amongst the best known essential trait approaches is that of Hans Eysenck[56], introduced by Charles Spearman, which had three dimensions with possible opposites:

- Extraversion – introversion
- Emotional stability – neuroticism

[55] Factor analysis is a statistical data reduction technique used to explain variability among observed random variables in terms of fewer unobserved random variables called factors. Factor analysis originated in psychometrics, and is used in behavioural sciences, social sciences, marketing, product management and other applied sciences that deal with large quantities of data (Factor_analysis 2009).

[56] Eysenck (1916-1997) was a German behavioural psychologist interested in the study of temperament, intelligence and personality (Boeree 2006; Eysenck 2008).

- Being in contact with reality – psychoticism (Eysenck 2008).

Sir Francis Galton was the first scientist to recognize the lexical hypothesis[57]. In 1936, Gordon Allport and H.S[58]. Odbert put this hypothesis into practice (Allport and Odbert 1936:211). Raymond Cattell obtained the Allport-Odbert list in the 1940s, eliminated synonyms and with further research identified 35 major clusters of personality traits which he referred to as the "personality sphere" (Big_Five_personality_traits 2009). Finally he proposed a theory of sixteen personality factors (Saadé et al 2006:542). However, the theory that has most empirical evidence behind it today may be the 'Big Five' personality traits[59], proposed by Lewis Goldberg (1981:142) and subsequently supported by many others.

The aspects that separate the five-factor model of personality from all others is that it is not based on the theory of any one particular psychologist, but rather on language, the natural system that people use to communicate their understanding of one another. The Big Five Factors and their seven constituent traits can be summarized as follows (Big_Five_personality_traits 2009; Boeree 2006):

- Openness to experience: appreciation for art, emotion, adventure, imagination, curiosity and variety of experience.
- Conscientiousness: tendency to show self-discipline, act dutifully, aim for achievement and plan rather than behave spontaneously.

[57] This is the idea that the most salient and socially relevant personality differences in people's lives will eventually become encoded into language (Big_Five_personality_traits 2009).
[58] The author made every attempt possible through web and database searches to find the first name of this author, but it could not be retrieved.
[59] These traits are five broad dimensions of personality developed through rational and statistical analysis of words related to personality. The model was first mentioned publicly in 1933 by Thunderstone in his presidential address to the American Psychological Association (Big_Five_personality_traits 2009).

- Extraversion: energy, positive emotions and the tendency to seek stimulation and the company of others, thus being adventurous, assertive, frank, sociable and talkative.
- Agreeableness: tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others, thus being altruistic, gentle, kind, sympathetic and warm.
- Neuroticism: tendency to experience unpleasant emotions easily, such as anger, anxiety, depression or vulnerability; sometimes called emotional instability.
- Introversion: being quiet, reserved, shy and unsociable.
- Emotional Stability: being calm, relaxed and stable.

Boeree (2006) defines temperament as that aspect of personality that is genetically based, inborn, there from birth or even before. That does not mean, however, that a temperament theory states that teachers and pupils do not also have aspects of personality that are learned.

Eysenck suggested two main personality factors. The first factor was the tendency to experience negative emotions, referred to by him as Neuroticism (N). The second factor was the tendency to enjoy positive events, called Extraversion (E). It is common practice in personality psychology to refer to the dimensions by the first letters N and E. N and E provide a two-dimensional space to describe individual differences in behaviour. Eysenck noted how these two dimensions were similar to the four personality types/temperaments[60] first proposed by the Greek physician Hippocrates (Eysenck 2008).

- High N and High E = Choleric type
- High N and Low E = Melancholic type
- Low N and High E = Sanguine type
- Low N and Low E = Phlegmatic type.

[60] During research, it was found that these two terms are used interchangeably, but for the purpose of the study the author prefers to use the term 'temperament' in order to be consistent.

The major strength of Eysenck's model was to provide detailed theory of the causes of personality. Eysenck proposed that extraversion was caused by variability in cortical arousal – introverts are characterized by higher levels of activity than extraverts and so are chronically more cortically aroused than extraverts. The effects on behaviour are that introverts seek lower levels of stimulation whereas extraverts seek to heighten their arousal to a more optimal level by increased activity, social engagement and other stimulation-seeking behaviours. The third dimension, psychoticism, was added to the model in the late 1970s (Eysenck 2008).

5.8 **Temperament and its subdivisions explained**

The terminologies used to describe temperaments differ, but there are a number of resemblances between temperament types.

The following explanation is by no means an in depth study of temperaments, but aims to assist the teacher to be aware of these different types when teaching pupils.

Boeree (2006) explains the four temperaments as follows:

- Choleric: The Choleric temperament is characterized by a quick, hot temper, often accompanied by an aggressive nature.
- Melancholic: The Melancholic temperament tends to be sad, even depressed, and takes a pessimistic view of the world.
- Sanguine: The Sanguine temperament is cheerful and optimistic, pleasant to be with and comfortable with his or her work.
- Phlegmatic: The Phlegmatic temperament is characterized by a slowness, laziness and at times dullness.

Rudolf Steiner[61], in his lectures on education at the beginning of the last century, brought his own approach to the four temperaments. He emphasized their importance in education, as this is a time when the child is strongly affected by his or her nature in this respect. A person's temperament may change, especially in the pre-puberty years, and often diminishes in importance as the personality becomes more developed after puberty. In any case, the temperament is not exclusive; most people combine aspects of all of them. One or two may dominate, however, or be prominent by their absence. In addition, for each temperament Steiner pointed out that there are less and more mature forms: the sullen, self-absorbed melancholic can mature to the sympathetic helper and/or the deep thinker. A person may transform his or her own temperament, as well, either by becoming more mature in what is naturally given or by metamorphosing into a different temperament (Temperament 2007).

5.9 **Role dynamics**

During practical teaching the author has experienced the role dynamics between teacher and pupil as a very real and valid aspect. This section of the thesis will focus on these roles played by teachers and pupils respectively, because knowledge thereof can assist the teacher to adapt more easily to a role that complements that of his/her student in order to obtain a more successful lesson outcome. During the course of the sections to follow the author will also focus on Dr Meredith Belbin's[62] Team Role Theory.

Belbin pointed out that team roles are not personality types; he regards them as 'clusters of characteristics', of which psychological preference is but one

[61] Rudolf Steiner (1861-1925) was an Austrian philosopher, literary scholar, educator, artist, playwright, social thinker, and esotericist. Steiner advocated a form of ethical individualism, to which he later brought a more explicitly spiritual component. He derived his epistemology from Johann Wolfgang Goethe's world view, where thinking is no more and no less an organ of perception than the eye or ear. Just as the eye perceives colours and the ear sounds, so thinking perceives ideas (Rudolph_Steiner 2007).

[62] Meredith Belbin is a British researcher and management theorist, best known for his work on management teams (Meredith_Belbin 2007).

dimension (Meredith_Belbin 2007). The value of the Belbin team-role theory lies in enabling an individual to benefit from self-knowledge and to adjust according to the demands being made by external situations (Belbin 2007).

Blatner (2006) refers to the term 'role dynamics' as synonymous with the systematic development of role theory. He describes the influence of Dr Jacob Moreno to be of profound significance to his approach regarding role dynamics. A number of other social psychologists are also listed as being involved in the pioneering of role theory. They include Ackerman, Biddle, Cooley, Linton, Newcomb, Parsons and Sarbin (Blatner 2006).

The basic 'role dynamic theory' comprises the following main aspects of interest:

- The mind works on two levels: There is the pluralistic dimension; the way the mind may be (in part) understood as an aggregate of a multiplicity of roles (parts, sub-selves, ego states, sub-personalities, complexes). The other level, the 'meta-role', modulates which roles are played when and how - this is the unifying function.

- A useful approach to education or therapy involves cultivating the skills and identity of the meta-role, and making this role and its function explicitly conscious (Blatner 2006).

5.10 Understanding the influences of brain profiles and personality types on teaching music in the 21st century

It is of importance to understand, within the context of this chapter, that the human being is an interlinked and intertwined entity; what Jensen describes a "system of systems" (Jensen 2000:18). There is no single system in the human body. Mind, body, personality and emotions all play a role in the success of other systems.

The emotional system (personal skills, aesthetic appreciation) impacts the cognitive system (visual-spatial, creative), which impacts the perceptual-motor system (sensory acuity, timing). This last mentioned system impacts the stress response system (immune response, autonomic nervous system) and also has an influence on memory status (attention, concentration) (Jensen 2000:18).

Teachers need to be open-minded, taking all of the above aspects into account. No two children are alike and embracing knowledge about brain profiles and personality types can lead to increasingly effective results in music teaching.