SUMMARY

DYNAMICS OF LEARNING STYLE FLEXIBILITY IN TEACHING AND LEARNING

by

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This study examines the significance of understanding learners' learning styles in relation to an educator's learning style. The study explores the extent to which an educator and learners make provision for learning style flexibility by knowing and understanding their learning styles. There were reasons for being actively involved in the study. I wanted to know my learning style and to know and understand the learning styles of my learners.

Action research was used to focus on the significance of learning style flexibility in my teaching practice, with the aim to developing myself as a professional and improving my teaching practice. Action research develops through a self-reflective spiral, consisting of cycle, each with its own steps of planning, acting, observing, reflecting and planning again for further implementation. Action research was critical in helping me to enhance my competencies and the competencies of learners who participated in my study and enabled me to improve in an ongoing, cyclical fashion.

The use of qualitative and quantitative research methods helped me to learn and understand my learning style and learners' learning styles. Herrmann's Whole Brain Dominance Instrument (HBDI) was used to identify my learning style. To identify learners' learning styles I used a simplified questionnaire that helped me to understand learners' thinking preferences according to the four quadrants of Herrmann's model. Learners' profiles were identified and indicated that they have didderent profiles. Feedback questionnaires for learners and lecturers were used to dtermine feedback on how I facilitate learning and accommodate learners according to their learning styles, and improve myself professionally.

Learning style flexibility is an approach that enhances teaching and learning, including the achievement of complex learning outcomes that includes attitudes and personality traits. Educators should move away from a content-driven learning approach to learner-driven approaches that allow learners to discover and construct knowledge on their own. Learning style flexibility and educational change complement each other. Learning style flexibility is significant in teaching and learning and the professional development of educators.

Key words:

- Learning style flexibility
- Learning opportunity
- Feedback questionnaires
- Constructive learning
- Action research
- Experiential learning
- Whole brain learning

- Multiple intelligences
- Learning style profile
- Facilitating learning

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TABLE OF CONTENTS

SUMMARY
CHAPTER 1: ORIENTATION TO THE STUDY

1	**Introduction**	1
2	**Aim of the Research**	1
3	**Critical Research Question**	1
4	**Rationale**	2
4.1	The contextual rationale	3
4.2	Scholarly rationale	5
5	**Theoretical Framework**	6
6	**Research Design**	10
7	**Conclusion**	11

CHAPTER 2: THEORETICAL FRAMEWORK

1	**Introduction**	13
2	**Definitions of Learning Style**	13
3	**Constructivist Perception**	14
4	**Kolb's Learning Theory**	18
5	**Herrmann's Four Quadrant Whole Brain Model**	**2**1
6	**Multiple Intelligences**	29
7	**Conclusion**	**3**2

CHAPTER 3: RESEARCH DESIGN

1	**Introduction**	33
2	**Aim and Research Questions**	33
3	**Research Methods**	34
4	**Setting up the Research Process**	37
4.1	Methodological and epistemological stance	37
4.2	Research site	41
4.3	Sampling of participants	41
4.4	Access issues	42
4.5	Ethical considerations	42
5	**Data Collection**	43
6	**Data Analysis**	45
7	**Trustworthiness and Validity**	46
8	**Conclusion**	47

CHAPTER 4: EMPIRICAL STUDY

1	**Introduction**	48
2	**Quantitative data**	48
2.1	Description of my learning style profile	48

2.2 Description of learners' learning style profile 52

3 **Feedback from Learners and Peers** 62

3.1 Feedback from learners 62

4 Qualitative Feedback 69

4.1 Feedback from peers 69

4.2 Self-assessment 71

5 Conclusion 78

CHAPTER 5: FINDINGS AND CONCLUSION

1 Introduction 79

2 Summary of Findings 79

3 Reflection on Methodology 82

4 Reflection on the Herrmann Brain Dominance Instrument (HBDI) 84

5 Reflection on Learner and Peer Feedback 84

6 Reflection on Peer Observations 85

7 Recommendations for Further Research 86

8 Conclusion 87

CHAPTER 6: META-REFLECTION

1 Introduction 88

2 Reflection on Compulsory Modules 88

3 Reflection on Course Work 90

4 Reflection on Facilitating Change in Education 93

5 Reflection on Research **94**

6 Conclusion 95

REFERENCES 96

LIST OF FIGURES

Figure 1: Holistic mind map of topics 9

Figure 2: Kolb's four learning styles 21

Figure 3: The Herrmann Whole Brain Model 25

Figure 4: Zuber-Skerritt's emancipatory action research model 35

Figure 5: Visionary action research model for transforming ones profession 36

Figure 6: Applied action research model 39

Figure 7: My HBDI profile 51

Figure 8: Simulated profile 2121 54

Figure 9: Simulated profile 1221 55

Figure 10: Simulated profile 2111 55

Figure 11: Simulated profile 2122 56

Figure 12: Simulated profile 1122 57

Figure 13: Simulated profile 1212 58

Figure 14: Simulated profile 2112 59

Figure 15: Simulated profile 1112 59

Figure 16: Simulated profile 1211 60

Figure 17: Simulated profile 1121 61

Figure 18: Responses to section B category I 62

Figure 19: Responses to section B category II 63

Figure 20: Responses to section B category III 64

Figure 21: Responses to section C category 65

Figure 22: Responses to section C category II 66

Figure 23: Responses to section C category III 67

Figure 24: Visual from the textbook 73

Figure 25: Visual from the textbook 74

Figure 26: Schematic representation of co-operative learning 76

LIST OF TABLES

Table 1: HBDI data Summary 50

Table 2: Estimated scores for learner questionnaire 54

Table 3: Example of activity from textbook 75

LIST OF APPENDICES

Appendix A: Ethical Clearance Certificate

Appendix B: HBDI

Appendix C: Whole Brain Learning Style Questionnaire for Learners

Appendix D: Lecturers Feedback Questionnaire

Appendix E: Peer Feedback Questionnaire

CHAPTER 1
ORIENTATION TO THE STUDY

1 Introduction

This chapter presents an overview of the research, beginning with the research aim, the research rationale and research questions. An overview of the theoretical framework and research design is given. It also sketches what follows in subsequent chapters.

2 Aim of the Research

The focus of this study is the significance of applying the principles of learning style flexibility in my teaching practice. Complementing this focus, the study aims at identifying:

- how I can adapt my style of facilitating learning to accommodate learners with different learning styles

- ways of establishing how I can support learners with different learning styles to become flexible and develop their full potential and

- how I can apply learning style flexibility in my practice in such a way that it can contribute to my professional development and improve my practice.

3 Critical Research Questions

In order to holistically explore dynamics of learning style flexibility in teaching and learning within the framework of the research context, I formulated the following research questions to guide the study:

- What is my learning style?

  This question is answered in chapter 4, where my results of the Herrmann Brain Dominance Instrument (HBDI) are discussed.

- How can I identify learners' learning styles?' by asking this question I got to understand that learners have different learning styles. This question helped me to understand how different learners learn in the classroom and how I can accommodate them during facilitation of learning.

- How can I use learning style flexibility to bring about change in my facilitating of learning? This question helped or made me to determine how my learning style can influence facilitation of learning. It made me to determine how to adapt to the changing direction of my teaching practice and how my facilitating of learning can accommodate different learning styles.

4 Rationale

This research has been motivated by numerous reports (Coffield et al, 2004) and research reports (Riding & Rayner, 1998; Kolb, 1984: Herrmann, 1996) on the learning style flexibility of learners and educators. The rationale for this study is two-fold.

First the contextual rationale reflects the paradigm shift taking place in the educational context of the research population of learners and teaching profession in the context of an FET (Further Education and Training) college. This shift opens the door for both learners and educators to understand each other – in terms of the style of facilitating learning and learning styles as they have not been able to do previously.

The second rationale is about the scholarly contribution of this study to the body of research on learning styles. The contribution this study makes is specifically in terms of learning style flexibility, as it relates to the work by Gardner (1993) on multiple intelligences, Herrmann's (1995) work on whole brain development, constructivist learning theory, proposed by

Vygotsky (1978), Piaget (1977) and Richardson (1997), outcomes-based education (DoE, 1997) and self- regulated learning (Pintrich, 2000).

4.1 Contextual Rationale

The title of my research, *Dynamics of Learning Style Flexibility in Teaching and Learning* is based on an action research approach, which aims at improving me and my teaching profession. Most schools and FET colleges, in contrast to the new outcomes-based approach still focus on teaching learners to master learning content, following a content-based approach, without much emphasis on how to apply learned knowledge in real life situations. Learners' different learning styles are not taken into consideration, but they are expected to succeed. Educators don't know their learners' learning styles and are not familiar with the theories on learning styles/thinking styles and the implications for their practices and that influence how they facilitate learning in the classroom. The terms 'learning style', 'thinking style' and 'learning style flexibility' are used interchangeably as these terms are to be found in the work of scholars with a focus on learning styles (a general term) used by Coffield et al (2004); the term 'thinking style' is used by Herrmann (1996) and 'learning style flexibility' by Biggs (2001), Du Toit (2009) and De Boer, Du Toit, Bothma and Scheepers (2012). 'Style' refers to a pattern that had been adopted by someone. I used it interchangeably to show that different scholars have different opinions about the phenomenon. I prefer 'learning style' to 'thinking style' as 'learning' is multidimensional. 'Thinking' creates the impression that it is about rational/fact-based learning only; while the emotional and visual parts of learning are negated. Rational learning and problem solving can be linked to different intelligences that are related to the left brain such as logical-mathematical intelligence (Gardner, 1993). Visual and emotive learning can be linked to intelligences such as interpersonal and spatial intelligence (Gardner, 1993).

In 1997 an outcomes-based approach to teaching and learning was adopted and first implemented by means of the so-called *Curriculum 2005* project (DoE, 1997). This was implemented to support educators and learners to live up to the expectations of the new

changes in education. *Curriculum 2005* was based on the ideal of lifelong learning for all South Africans that will effect "a shift from one which has been content-based to one which is based on outcomes'' (DoE, 1997:1). It is also described as a shift from the traditional objectives-based approach to an outcomes-based approach (DoE, 1997:3). Several changes in terms of the OBE approach were observed over the past few years. The Chisholm report (Chisholm, Motala & Vally, 2003:50) indicates that assessment is based on 66 specific outcomes which is beyond the capacity of the most dedicated primary school teacher and has led to many problems: "teachers are exhausted and despondent about the assessment demands which take them away from teaching time". Several scholars refer to the fact that assessment should be learner-paced (happens when the learner is ready) and learner-centred (the main purpose being to help the learner) to make sure that assessment fulfils both its developmental and monitoring functions. These ideas could be applicable for the training of apprentices in a job-situation but for the education of the masses it is just not practical. This reports led to National Curriculum Statements (NCS) which reduced specific outcomes to 33 learning outcomes. The revised National Curriculum is thus not a new curriculum but a streamlining and strengthening of Curriculum 2005. It keeps intact the principles, purposes and thrust of Curriculum 2005 and affirms the commitment to outcomes-based education (DoE, 2002). Learning Outcomes for learning areas are the same from Grade R – Grade 9, with different assessment standards for different grades (DoE, 2002).

From the onset the OBE system was not without its own challenges. The challenges which the Department of Education faced were that there were not enough programmes to develop educators to understand that all learners can achieve, and that content needs to be seen as a support for addressing and facilitating learners' achievements of outcomes rather than the end in itself (Killen, 1997:30). Researchers such as Slabbert (2006) argue that change in education forces us to completely rethink what we ever understood about learning, teaching and education. The kind of learning that education requires, therefore is the construction of meaning by the learner him-/herself, who is then able to use it to do something creatively new. The aim of education is to educate learners to maximise and fully utilise their human potential towards a safe, sustainable and prosperous universe for all, through facilitating lifelong learning (Slabbert, 2006).

The learning styles of both educators and learners are important for one to understand change in education. According to Keefe (1979) learning styles can be defined as a set of cognitive, emotional, characteristic and physiological factors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment. Keefe (1991) defines learning style as a passion typical mode of perceiving, remembering, thinking and problem solving – as an indicator of how learners learn and like to learn. Learners' style of learning, if accommodated, can result in improved attitudes towards learning and increase in thinking skills, academic achievement, and creativity. Gregorc (1985) describe learning styles as stable and pervasive characteristics of an individual, expressed through the interaction of one's behavior and personality as one approaches a learning task. Learning style is an important factor in several areas including students' academic achievement, how students learn and educators facilitate learning, and student-educator interaction (Witkin, 1973). Knowing one's personal learning style can be of benefit in many ways, as one can know himself or herself better and become more flexible in the way that one recognises and solves problems.

By means of this research I wanted to construct my own meaning of how learners' different learning styles are accommodated and how that accommodation of learning styles benefit learners. I also wanted to construct meaning of how educators use their learning styles and knowledge of learning styles to facilitate learning to learners with different learning styles by investigating my own practice in this regard – my own classroom being the micro context of this study. Furthermore I wanted to construct meaning of how learning style flexibility in terms of my facilitating of learning and the learning of the learners can be promoted.

4.2 Scholarly Rationale

Most researchers (De Boer, Steyn & Du Toit, 2001) who researched learning styles agree that decisive progress in educational standards occur where every learner matters, careful attention is paid to their individual learning styles and motivations and needs. According to De Boer, Steyn and Du Toit (2001) educators should be made aware that transformation of education encourages educational issues to reflect the learner and learning as the point of focus. My

research was conducted to add to the current body of knowledge about learning style flexibility, as adopted from the work of Herrmann (De Boer, Steyn & Du Toit, 2001) and the implementation of the relevant principles. Among other aspects, it involves the development of materials considering different learning styles. In terms of Herrmann's model, Lumsdaine and Lumsdaine (cited by De Boer et al, 2001) identified the following modes of learning:

- External learning
- Internal learning
- Interactive learning
- Procedural learning

Therefore, the inquiry seeks to contribute to the current body of knowledge based on my scholarly exploration and experience of how learning style flexibility benefits both learner and educator. This experiential learning process (Kolb, 1984) is evidence of applying the principles of self-regulated learning (Zimmerman, 1990) as part of my professional development. Action research principles are closely related to the principles of both self-regulated learning and constructivist learning. As this research shows that learning style flexibility enhances teaching and learning, including the achievement of complex outcomes that include attitude and personality traits, strategies that are verified as effective will be of interest to many educators.

5 Theoretical Framework

To understand and explain data collection in response to my research topic, and particularly for unpacking research questions, I consulted the work of scholars reported in different sources such as "Teaching style, where are we now?" (Heimlich & Norland, 1994); The student learning process, learning styles or learning approaches (Cuthbert, 2005): "A four quadrant whole brain approach in innovation and engineering problem solving to facilitate teaching and learning of engineering students" (Horak, Steyn & De Boer, 2001).

The main focus on 'learning style' and 'learning style flexibility' is on my way of thinking, learning, doing and problem solving. Determining the learning styles of the learners only served as a 'benchmark' for the need to adapt my style of facilitating learning as my learning style directly influences my style of facilitating learning (teaching). Accommodating learners' learning styles is one side of the educational imperative we as lecturers have; the other is challenging them to learn how to adapt to other styles of learning. This would contribute to developing their full potential. I am the initiator of the novel/innovative intervention of applying the principles of learning style flexibility in my practice for the first time. Therefore the 'learning style flexibility' lens is used to look into what I do – a typical point of focus in action research that McNiff (2002) often refers to.

Theories of outcomes-based education (OBE) envisage the development of the full potential of all learners in order to become lifelong learners who are confident, independent, compassionate and have the ability to participate in society as critical thinkers and active citizens (DoE, 2002). According to Van der Horst and McDonald (1997:25) OBE helps educators to move away from a content-driven approach to learning to one where learners discover and construct knowledge.

Roles of educators outlined in the *Norms and Standards for Educators* (DoE, 2000) encourage educators to recognise the fact that learners possess different or multiple intelligences, which should be accommodated in the classroom as proposed by scholars such as Gardner (1983). Educators are expected to be mediators or facilitators of learning, interpreters and designers of learning programmes that accommodate learning styles of learners.

Researchers such as Slabbert (2006) believe that there is a relationship between learning style flexibility and educational change. They argue that educators should be facilitators of learning who can initiate learning and ensure that learners keep on learning until the highest possible quality of learning has been achieved; as opposed to educators who give instructions to learners to learn only at a lower level of engagement with the learning content and learning process. The more educators participate in initiating roles in school change, and the more positive they feel about change, the more willing they are to engage seriously in future change. Slabbert (2006) argues that the kind of learning that education requires is learner-centred.

This change from teacher-centredness to learner-centredness is according to Du Toit (2008) only a matter of flipping the coin and refers to the important point that the term learning-centredness should rather be used, with which I fully agree. Learning-centredness implies the notion that within such an approach both the educator and learner are to learn in the same classroom and college context. College is an authentic life experience (Du Toit 2008) that offers the educator the opportunity for professional learning. Therefore, Du Toit (2008) continues to say that the principles of self-regulated learning and meta-learning are to be translated to self-regulated professional development or teaching and meta-teaching as it is to be found in the principles of action research. This was the impetus to my study to include theories on action research as a learning theory for the professional learning of educators. This theoretical enrichment, indicating the multi-sidedness of the educational coin is visually represented in the theoretical framework below.

The theories addressed in this study serve both sides of the education coin – it is related to the professional learning of educators and the learning by learners. According to Stayanova and Kommers (2002) learners should be encouraged to develop their own information maps using different learning styles so that they can be flexible in their processing of information. This can be achieved through an array of learning opportunities such as co-operative learning and self-regulated or meta-learning.

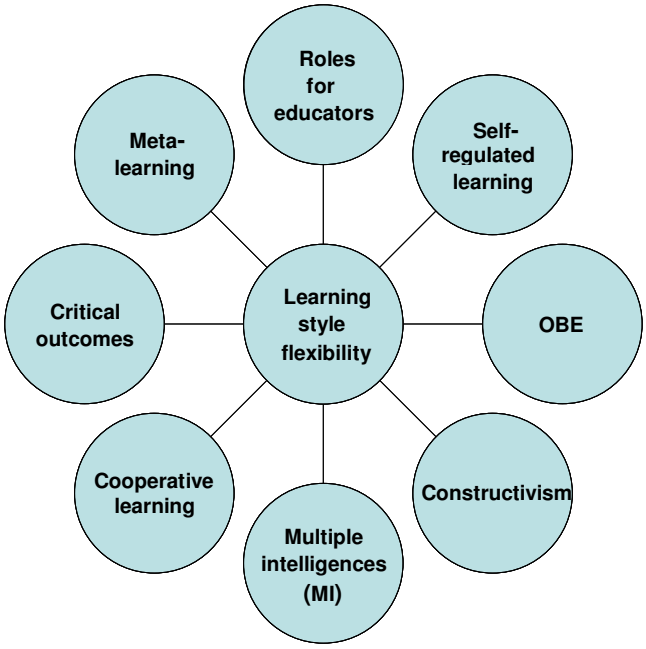
The constructivist learning theory is about how individual learners understand and experience things, being it abstract, physical, practical or processes, in terms of development stages and learning styles (Vygotsky, 1978). Furthermore, according to Jean Piaget (Richardson, 1997) through the process of accommodation and assimilation, individuals construct new knowledge from their experiences. When individuals assimilate, they incorporate the new experience into an already existing framework. According to the social constructivists approach, educators have to adapt to the role of facilitators and not teachers (Richardson, 1997). The emphasis turns away from the educator and the content towards the learner.

Theorists' work on educational change, such as Slabbert (2006) was consulted. The scholarly work mainly covers facilitation of learning, involvement of educators in college change, lifelong learning in South Africa, how educators experience change and educational solutions

to improve the employability of learners and how educators apply the seven roles of educators in their facilitation of learning.

This visual suggests that the educational practice in question is multidimensional. Apart from the theories mentioned, that form the core of my study, one should keep in mind that theories of curriculum development, theories on assessment and many more are all relevant. One cannot discuss facilitating learning without keeping the curriculum and related curriculum development theories in mind; one cannot discuss facilitating learning without referring to assessment and related theories on assessment. However, as indicated, the theories included in the figure below have been selected with a view to focusing the study and aligning literature studied with the research questions.

Figure 1: Factors that influence learning style flexibility



6 Research Design

Action Research was used to focus on the significance of learning style flexibility in my teaching practice, with the aim to developing myself and improving my teaching practice. Action Research was suitable for my professional development as I was participating in the research as participant and researcher at the same time. Hopkins (2001) defines action research as a personal attempt to understand, improve and reform one's practice. Action research develops through a self-reflective spiral, consisting of different cycles, each following the steps of planning, acting, observing, reflecting, evaluating and planning again for further implementation. Action research was critical in helping me to enhance my competencies and the competencies of learners who participated in my research and enabled me to improve in an ongoing cyclical fashion. Action research is about the professional development of the educator and the improvement of one's practice.

In my research, learners and my colleagues were involved and their responses were critical in terms of collecting and interpreting data.

Initially Zuber-Skerritt's emancipatory action research model was chosen to develop myself and improve my teaching practice. Zuber-Skerritt (2000) argues that action research is the individual self-assessment of a practitioner in his/her practice. I planned to use Zuber-Skerritt's model to plan for improvement after identifying areas which need development. This was to be done through observations and feedback from learners and colleagues. Zuber-Skerrit (1992) took the work of Lewin (1946) on the Force Field Model and the work of De Beer et al (2000) on the Task Alignment Model to clarify the steps of action research with a view to explaining the Emancipatory Action Research Model. During the process of my professional learning I discovered that most of the work on action research refer to identifying a problem (Zuber-Skerritt, 1992) as we find in traditional research; or refer to asking questions such as "what is my concern?" (McNiff & Whitehead, 1996). This reflects a deficit-based approach to action research where the practitioner as action researcher almost asks the question "What is wrong with my practice?" according to du Toit (2010). He refers to the fact that asking such questions is starting off with a negative. Instead, he proposes starting with a positive – an innovative idea. One then focuses on innovating and transforming one's practice

by implementing an innovative idea that one came across while studying the literature. He calls this an asset-based approach to action research. I have decided to rather use this model. In the context of my study under discussion the innovative idea that I started with was Herrmann's (1995) work on whole brain learning. I account for my research design in more detail in chapter 3.

Research questions were answered by using different research methods and techniques. Both qualitative and quantitative methods were used to gather data. To identify my learning style I used the Herrmann Brain Dominance Instrument (HBDI) (Herrmann, 1996) as quantitative tool. The data obtained from the HBDI also includes qualitative data in the form of a description of my learning style. To determine how I can use learning styles for change in my facilitation of learning and assessment, I used both quantitative and qualitative research methods and techniques. For the purpose of obtaining feedback from learners I used a feedback questionnaire. For the purpose peer assessment I used observations and narratives. For self-assessment I used reflection on my learning opportunities and learning material being used.

7 Conclusion

This chapter outlined the context of the study in terms of its aims, the purpose of the research, rationale of the research, theoretical framework used and research design. This chapter has explored the background of my study on learning style flexibility.

Chapter 2 focuses on a theoretical framework on learning style flexibility and related theories in relation to my teaching practice.

Chapter 3 focuses on the research design which includes substantiating my choice of action research model, the research methods, techniques and tools used in the study and the reasons for choosing them. The chapter explores ethical issues and the limitations of the study.

Chapter 4 focuses on the empirical data of the study. Evidence of my professional development is presented in this chapter and Chapter 5 presents the findings and conclusions on the study and chapter 6 presents meta-reflections on my professional learning journey.

CHAPTER 2
THEORETICAL FRAMEWORK

1 Introduction

This chapter focuses on the work of different researchers and theories on learning styles and related theories in relation to teaching and learning. Different sources on learning styles were consulted to get more information related to my topic. Learning is the development of new knowledge, skills, and attitudes when the individual interacts with information and environment (Heinlich & Norland, 1994). Learning takes place in different forms. It can be incidental learning or learning that takes place in response to intentional educational instruction. One can learn from studying how others learn. No two people will learn the same things, nor will they learn in the same way, even in the same situation. This is because different types of people have different ways of learning, known as their learning style. Learning styles can be used in any environment when people interact. Therefore learning styles should be complemented or accommodated by educators during facilitation of learning.

2 Definitions of Learning Style

The term 'learning style flexibility' is used by scholars such as Entwistle, McCune and Walker (cited in Du Toit & Van Petegem 2006) for some time. They see it as adapting one's style of learning in accordance with the nature and perceived demands of the task at hand. Biggs (in Du Toit & Van Petegem 2006) considers learning styles as flexible and something that can be learned as learning style is a matter of both nature and nurture.

Different scholars tried to establish and understand learning styles. Keefe (1979) defines learning style as an indicator of how learners learn and prefer to learn. It is also defined as a person's preferred approach to learning, which may be an important determinant of academic performance. The term learning style is used to denote an individual's consistent preferences

for particular ways of gathering, processing and storing information and experiences. According to Kolb (1984) and Honey and Mumford (1986), learning style is an individual's preference for understanding his/her experiences and transforming them into knowledge. This is based on Kolb's model (1984) of experiential learning which postulates that the learner undergoes four stages in the process of learning which are concrete experience, reflective observation, abstract conceptualisation and active experimentation. Kolb (1984) and Honey and Mumford (1986) argue that learning style is identified from the co-ordinates of the individual's scores on the two dimensions derived from the Learning Style Inventory (LSI) of Kolb. It represents the weighting that a learner places on the learning style, and is seen as the typical strategy that the learner will adopt in any learning situation. Learning style is the cognitive, affective, and physiological factors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment (Keefe, 1991). Therefore learning style is an individual's way of processing and interpreting information for effective understanding.

3 Constructivist Perception

Researchers have shown that not all learners learn in the same way because of their different learning styles (Witkin, 1973; Gregorc, 1979). The characteristics in terms of learning of educators are diverse as those of learners. This suggests that the learning style, teaching style and personality style of educators have implications for learners' learning. It is expected of educators to know their learning styles so that they can be able to accommodate learners' different learning styles in their facilitating of learning. According to Gregorc (1979) individuals have the basic capability to learn and to teach, however, they are not able to learn and teach effectively in the same exact way. This implies that learners do not only learn in considerably different ways, but certain learners succeed only through the application of selected methods of facilitating learning. Since not all learners learn in the same way, it is important that educators recognise the learning style differences of their learners and facilitate learning in a manner in which all learning styles of learners are considered/accommodated.

According to Dunn and Dunn (1979) educators' styles of facilitating learning are supposed to be consistent with their learning styles or how they were taught. Hence, educators facilitate learning the way they learned. However, Koppleman (1980) argues that educator learning styles can have influence on educators' style of facilitating learning. In an attempt to describe an individual educator's style of facilitating learning one can identify two domains, namely sensitivity and inclusion. The sensitivity domain is based on the ability of an educator to sense the shared characteristics of the learners or shared learning styles of the learners. The inclusion domain is based on educators' willingness and ability to utilise strategies of facilitating learning that take advantage of learners' shared characteristics and shared learning styles. This approach can help educators to accommodate learners with different learning styles in their facilitating of learning in the classroom (Koppleman, 1980).

Individual educators can be classified into one of four facilitating styles based on how sensitive and inclusive they are. Educators who have low inclusion and low sensitivity are labeled "expert" and they use venture method to facilitate learning. Educators who have low inclusion and high sensitivity are labeled "providers" and are learner-centred and seek to facilitate effectively. Educators who have high inclusion and sensitivity are labeled "facilitator" and they are learner-centred and their methods of facilitating learning are not dictated by the subject matter. Educators who have high inclusion and high sensitivity are labeled "enablers" and are very learner-centred as learners are given opportunity to define both the activity and the process in the learning environment. Based on this argument, educators are expected to know, understand and teach learners with different personalities and learning styles (Von Glaserfeld, 1995).

According to the constructivist learning theory (Von Glaserfeld, 1995) one of the first things an educator must do when considering how to facilitate learning is to acknowledge that no two learners learn in the same way. Furthermore, it is argued that the responsibility of learning should reside increasingly with the learner (Von Glaserfeld, 1995). According to the social constructivist approach, educators have to adapt to the role of facilitators and not teachers. Where a teacher gives a didactic lecture which covers the subject matter, a facilitator navigates the learner in getting to his or her own understanding of the content and mastering of learning outcomes. A teacher tells, a facilitator asks; a teacher lectures from the front, a facilitator

supports from the back; a teacher gives answers according to a set curriculum, a facilitator provides guidelines and create the environment for the learner to arrive at his or her own conclusions; a teacher mostly gives a monologue, a facilitator is in continuous dialogue with the learners.

For learners to maximise their learning potential, educators are expected to use more than one style to facilitate learning (direct instruction, collaborative learning, inquiry learning, etc). According to the constructivist learning theory, it is expected of an educator to implement a variety of learning styles throughout the learning opp0rtunity to allow all learners to have the chance to learn in at least one way that matches their learning styles. Accordind to Piaget (1973) constructivism is a theory of knowledge creation which argues that humans generate knowledge and meaning from their experiences by incorporating the new experiences into an already existing framework. Constructivism can also be defined as learning that offers an explanation of the nature of knowledge and how human beings learn. It maintains that individuals create or construct their own new understanding through the interaction of what they already know and believe and the ideas, events and activities with which they come in contact. Learning activities in constructivist settings are characterised by active engagement, enquiry, problem solving and collaboration with others. In a constructivist setting an educator is a guide, facilitator and co-explorer who encourages learners to question, challenge and formulate their own ideas, opinions and conclusions (Piaget, 1973).

Constructivist theorists (Vygotsky, 1978) encourage educators to create learning environments that can support and challenge learners' thinking. This means that if an educator chooses just one style of facilitating learning (direct instruction, collaborative learning, inquiry learning, etc), learners will not be able to maximise their learning potential. If educators can accommodate a variety of learning styles during a learning opportunity learners will have the chance to learn in at least one way that matches their learning style. Constructivist learning theorists (Vygotsky, 1978) argue that the best way for learners to learn is by constructing their own knowledge instead of having someone constructing it for them. Constructivist learning theory states that learning is an active process of creating meaning from different experiences. In other words, learners will learn best by trying to make sense of something on their own with the educator as a guide to help them along the way (Brooks & Brooks, 1993). Furthermore, it

is argued that the responsibility of learning should be increasingly with the learner. The learner should be actively involved in the learning process (Von Glaserfeld, 1978). Social constructivists (Vygotsky, 1978; Von Glaserfeld, 1978) emphasise the importance of the learner being actively involved in the learning process unlike previous educational viewpoints where the responsibility of learning rested with the instructional-driven education to teach and where the learner played a passive role. Vadeboncoeur (1997) argues that learning is an individualistic enterprise, therefore educators should be able to adapt to the role of facilitator. So it is expected of educators to be facilitators of learning. Facilitators should be able to adapt the learning experience by using their initiative in order to direct the learning experience to where the learners want to create value (Rhodes & Bellamy, 1993). According to Von Glaserfeld (1978) the learner must be motivated to learn and sustain motivation to learn independently. If the learners manage to complete challenging tasks, they will gain confidence and motivation to embark on more complex challenges (Brooks & Brooks, 1993). A motivated learner becomes an effective and self-efficient learner who can manage his/her learning using learning styles he/she is comfortable with and be able to support other learners.

Constructivist theorists (Vadeboncoeur, 1997) highlight the following constructivist principles of learning:

- Learning is an active process in which the learner uses sensory input with a view to obtaining meaning out of it. The more traditional formation of this idea involves the issue of active learner stressing that the learner needs to do something; that learning involves the learner's engaging into the world.

- People learn to learn as they learn. Learning consists of both constructing meaning and constructing systems of meaning. Each meaning learners construct makes them better able to give meaning to other sensations which can fit a similar pattern.
- The crucial action of constructing meaning is mental; it happens in the mind. Learners should be provided with reflective activities which engage both mind as well as the hands.

- Learning involves language; language used influences learning. People talk to themselves as they learn; and language and learning are inextricably intertwined.

- Learning is a social activity. Learning is intimately associated with the connection with other human beings e.g. educators, peers and family.

- One needs knowledge to learn. It is not possible to assimilate new knowledge without having some structure developed from previous knowledge built on.

- Motivation is a key component in learning and promotes learning.

Brooks and Brooks (1993) suggest that for educators to accommodate different learning styles in one classroom, they should:

- encourage and accept learner autonomy and initiative

- use raw data and primary sources, in addition to a manipulative, interactive and physical method

- search out learner understanding and prior experiences about a concept before facilitating learning

- encourage learner critical thinking and inquiry by asking them thoughtful, open-ended questions, and encourage them to ask questions to each other

- provide enough time for learners to construct their own meaning when learning something new.

4 Kolb's Learning Theory

Constructivist learning theory supports Kolb's (1984) experiential learning theory by encouraging learners to construct their own meaning. Kolb's experiential learning explores the cyclical pattern of all learning experiences through affection and conceptualising to action and

on to further experience. Experiential learning can also be used to describe the process for recording educator continuous professional development, through taking time to capture and record and implement learning in our daily work (Kolb, 1984).

David Kolb (1984) has extended his work to explore different ways in which we all learn, which is labeled learning styles. According to Kolb (1984) learning styles mean that at minor level there is a need for adjustment between the learner and educator; sometimes their preferences are complementary, sometimes antagonistic, and of course sometimes collusive if they both tend to go for the same stages in the cycle. David Kolb(1984) created a model of four elements: concrete experience, reflective observation, the formation of abstract concepts and testing in new situations. This model was represented in experiential learning circle. Kolb's Learning Theory sets out four distinct learning styles which are based on four stages learning cycle (Kolb, 1984). Kolb's Model offers both the way to understand individual people's different learning styles, and an explanation of a cycle of experiential learning that applies to us all. Kolb uses the terms diverging, assimilating, converging and accommodating to define learning styles. According to Kolb (1984) different people naturally prefer a certain learning style.

Next follows a brief description of Kolb's learning styles:

- *Diverging (feeling and watching)*

Diverging people are able to look at things from different perspectives. They are sensitive. They prefer to watch rather than tending to gather information and use imagination to solve problems. They are best at viewing concrete situations from several different viewpoints. People with the diverging style prefer to work in groups, to listen with an open mind and to receive feedback.

- *Assimilating (watching and thinking)*

The assimilating learning preference is for a concise, logical approach. Ideas and concepts are more important than people. People with this learning style require good, clear explanations rather than practical opportunities. They excel at understanding wide ranging information and

organising it in a clear logical format. In formal learning situations, people with this style prefer readings, lectures, exploring analytical models and having time to think things through.

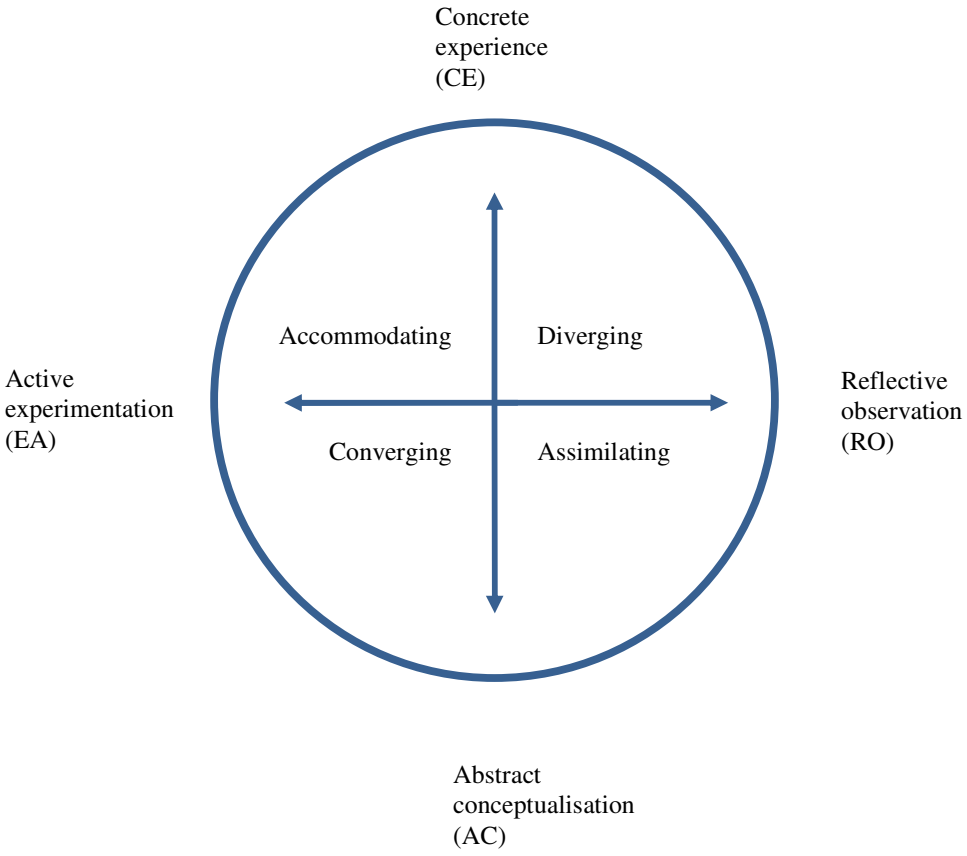
- *Converging (doing and thinking)*

People with a converging learning style are inclined to solve practical problems and will use their learning to find solutions to practical issues. They prefer technical tasks and are less concerned with people and interpersonal aspects. People with this learning style are best at finding practical uses for ideas and theories. They solve problems and make decisions by finding solutions to questions and problems of a practical nature. People with a converging learning style like to experiment with new ideas, to simulate scenarios and to work with practical applications.

- *Accommodating (doing and feeling)*

The accommodating learning style is "hands on" and relies on intuition rather than logic. People with this learning style use other people's analysis, and prefer to take practical, experiential approach. They are attracted to new challenges and experiences, and to carrying out plans. They commonly act on 'gut' instinct rather than logical analysis. People with an accommodating learning style prefer to work in teams to complete tasks. They set targets and actively work in the field trying different ways to achieve an objective.

Figure 2: Kolb's four learning styles



Kolb (1984) argues that people who have a clear learning style preference will tend to learn more effectively if learning is orientated according to their preference.

5 Herrmann's Four Quadrant Whole Brain Model

Herrmann's whole brain model is selected by Coffield et al (2004) as one of 6 learning style theories investigated by them from an array of 13. On the title page it is indicated that (Coffield et al 2004) the report critically reviews 13 of the most influential learning style models (there are many more). The report focuses mainly on the applicable instrument being used and it matters fundamentally which one is chosen. The implications for teaching and

learning should be a concern of all stakeholders: learners, teachers, faculty, trainers, managers, researchers and inspectors. They refer to a continuum of learning style theories. It was not the intension with my study to examine learning style theories as it is extensively done by Coffield (2004) and not within the scope of a mini-dissertation. As the Coffield-report has as focus the applicable instrument being used to identify learning styles, my interest is to use the outcome of the instrument (in my case the HBDI) and underpinning theory to improve my practice.

The array of learning style theories is divided in different families. It shows the diversity in general and the use of different terms for the same phenomenon. Examples are:

- Genetic-based family
  - Cregore's Mind Style Model
  - The Dunn and Dunn Model of Learning Styles
- Cognitive structure family
  - Riding's Model of Cognitive Styles
- Stable personality type
  - Myers-Briggs Type Indicator
  - Apter's Theory of Motivational Types
  - Jackson's Learning Styles Profiler
- Flexibility stable learning preferences
  - Kolb's Learning Style Inventory
  - Honey and Mumford's Learning Style Questionnaire
  - Herrmann's Whole Brain Model
  - Allison and Hayes's Cognitive style Indicator
- Learning approaches and strategies
  - Entwistle's Approach and Study Skills Inventory
  - Vermunt's Learning Style Inventory
  - Sternberg's Theory of Thinking Styles

This list shows that the terminology used within the field of learning styles is more diverse and interchangeable as the same construct is called 'learning style', 'thinking style', 'mind styles', 'cognitive styles', ' motivational types', 'learning preferences' and 'personality type'.

As indicated in other sections in this document my use of 'learning style flexibility' is derived from the term 'learning style' as used by Herrmann (1996). The four quadrants each represents a style of learning and necessitates flexibility. The dominant learning style and quadrant is determined by completing the HBDI (Herrmann Brain Dominance Instrument) consisting of 120 items. Although the instrument is initially designed to identify one's learning style, it is widely applied to indicate one's preference for solving problems in different ways. Therefore reference is made to whole brain learning (learning style flexibility), whole brain communication (flexibility in communication style), whole brain teaching (teaching style flexibility) and whole brain management.

The instrument does not specifically identify one's teaching style (style of facilitating learning) but as teaching is in essence a 'problem' to be solved, the outcomes of the HBDI are translated from a learning context to a teaching context where all the roles of a lecturer (DoE 2006) can be linked to the skills related to communication, facilitating learning and management. The translation to teaching style would mean that my double dominant profile indicating that my learning mode is structured and emotive, my preferred way of teaching (facilitating learning) would also be structured and emotive.

As is typically the format used in the Faculty of Education at the University of Pretoria, chapter 2 (theoretical framework) represents the literature review. The theoretical framework serves as an integration of the applicable literature/theories studied.

Herrmann's Four Quadrant Whole Brain Model (1995) supports Kolb's Model of learning styles. Herrmann (1996) points out that the right hemisphere and left hemisphere of the brain has its own specialisation and its own limitations and advantages. The Herrmann Brain Dominance Instrument (HBDI) (Herrmann, 1995) is used to describe human thinking style preferences. According to Horak, Steyn and De Boer (2001) diversity in thinking style preference has implications for teaching and learning style preferences that poses challenges for all classroom practices. That is why in terms of Herrmann's model, all four brain quadrants should be included in teaching and learning (Knowles, 1990; Ornstein, 1997). Herrmann's

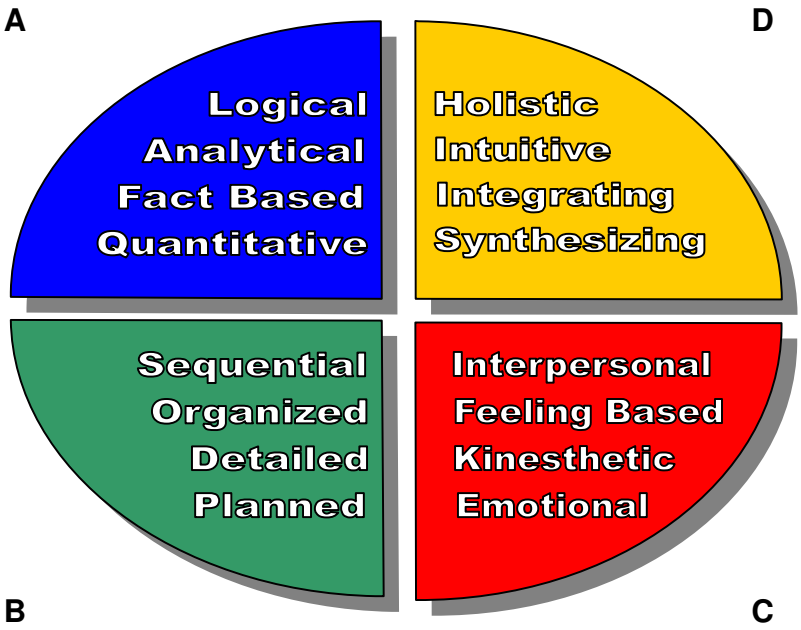
model necessitates that educators become aware of their own thinking preferences and the implications therefore for the teaching practices. (Felder, cited in De Boer, Steyn & Du Toit, 2001) remarks that

> If professors teach exclusively in a manner that favors their student's less preferred learning style modes, the student's discomfort level may be great enough learning styles to interfere with their learning. On the other hand, if professors teach exclusively in their students preferred modes, the students may not develop learning styles the mental learning styles dexterity they need to reach learning styles their potential achievement in school and as professionals.

Educational activities should be structured in a means that they incorporate the expectations of learners in all four quadrants and this will facilitate the development of the full potential of a learner. Design and delivery approaches should vary so that learning can be facilitated in all four specialised quadrants. Herrmann's four quadrant Whole Brain Model (Herrmann, 1995) stipulates clearly expectations of learners with thinking preferences in their four quadrants.

Consequently this is outlined in a schematic representation:

Figure 3: The Herrmann Whole Brain Model (Herrmann 1995:411; 1996:30)



The whole brain model can be applied in many contexts, including personal growth, counseling, group processes, teaching and learning, decision making and management. The whole brain model is not based on biological determinism. Indeed, Herrmann (1996) persuaded that "the way a person uses the specialized brain results from socialization-parenting, teaching, life experiences, and cultural influences, and cultural influences – far more than from genetic inheritance". He believes that it is in the interest of individuals and organizations, which could be a college (at macro level) or classroom (at micro level) to develop sufficient flexibility to respond, against their natural preferences to meet particular situational demands; and, where necessary, to make longer-lasting value-based adjustments, especially if this can release latent creativity in an individual or in an organisation. The four categories in Herrmann's model can be summarised as follows:

The learner with an A quadrant thinking preference expects:

- Precise, to the point information
- theory and logical rationales
- proof of validity
- research references
- textbooks readings
- numbers, data.

The learner with a B quadrant thinking preference expects:

- An organised, consistent approach
- staying on task, on time
- complete subject chunks
- a beginning middle and end
- practice and practical applications
- examples
- clear instructions or expectations.

The learner with a C quadrant thinking preference expects

- Group discussions
- sharing
- expressing ideas
- feeling-based learning
- hands on learning
- personal connection
- emotional involvement
- user-friendly learning
- using all senses.

The learner with D quadrant thinking preference expects:

- Fun and spontaneity
- playful approaches
- pictures, metaphors, overview
- discovering and exploration
- a quick pace
- variety in format
- opportunity to experiment.

Scholars such as Saroyan and Snell (1997); Ramsden (1992); and Knowles (1990) support Herrmann's Whole Brain Model as they agree that for learning to be possible for all learners, educators have to structure the content, design and delivery of any learning activity in such a way that it is whole brained in order to meet the diverse thinking and learning styles of the learners. Whole brain teaching and learning provides the basis for bridging the gap between the unique individual learner and the design and delivery of the learning (Knowles, 1990).

Herrmann's whole brain approach (Herrmann, 1995:155) can influence education and training restructuring in South Africa with its core principle of outcomes-based approach` to teaching and learning. Olivier (1998) points out that the "outcomes based learning approach intends to focus equally on knowledge, skills, the process of learning and the final outcome or product". Herrmann's model of four quadrants indicates that an outcomes-based approach and a whole brain approach to learning and teaching are complementary. Processes to achieve learning outcomes are critical thinking, problem solving, application, appreciation, analysing, synthesising, evaluation of information, team work, communication and socialising (Olivier, 1998). Critical outcomes are general things one can do and understand which matter in all areas of learning, like communicating and problem solving. They are cross-curricular, broad generic outcomes.

An example of how outcomes-based education complements Herrmann's whole brain approach is to be found in Curriculum 2005 (Doe, 2002) and the seven critical cross-field outcomes:

- Communicate effectively using visual, mathematical and/or language skills in the modes of presentation

- identify and solve problems in which responses display that responsible decisions, using critical and creative thinking, have been made

- organise and manage oneself and one's activities responsibly and effectively

- work effectively with others as a member of a team, group, organisation or community

- collect, analyse, organise and critically evaluate information

- use science and technology effectively and critically, showing responsibility towards the environment and health of others

- demonstrate an understanding of the world as a set of related systems by recognising that problem-solving does not exist in isolation.

In terms of identifying one's learning style by means of the HBDI is deliberating and supports the idea that action research is emancipatory (Zuber-Skerritt cited in Du Toit 2009). Applying the principles of learning style flexibility in one's own practice for the first time as a novel/innovative idea fills a huge gap in the literature as most of the learning style theories are concerned with the applicable instrument *per se* and less with the application of the applicable principles in practice. The so-called Coffield report (Coffield et al 2004) is a typical example. My research addresses a gap in my own practice and by investigating it I construct new meaning and contribute to the current body of knowledge, based on my lived experience. I further link action research and learning styles which is not done by many scholars, especially at the University of Petoria. I also consider action research as whole brain research: It is personalised (emotive quadrant) as I am focusing on me, it is structured (it follows a step by step cyclical process which is characteristic of a structured learning style), it is fact-based (typical of a preference for rational thinking) and visionary (typical of a creative and holistic approach to learning). Studies on learning style flexibility in South Africa are limited.

6 Multiple Intelligences

The developmental outcomes are supported by Gardner's multiple intelligences theory and Herrmann's Whole Brain teaching and Learning Theory. Gardner (1983) argues that eight different intelligences help one to account for a broader range of learners' potential in the class. For educators to design the way they facilitate learning multiple intelligences should be considered. This can be linked to the five developmental outcomes that form part of the critical cross-field outcomes:

- Reflect and explore a variety of strategies to learn more effectively
- participate as a responsible citizen in the life of local, national and global communities
- be culturally and aesthetically sensitive across on range of social contexts
- explore education and career opportunities
- develop entrepreneurial opportunities.

Gardner (1993) suggests that there are number of distinct forms of intelligence that each individual possesses in varying degrees. Gardner argues that the implication of the theory is that learning or teaching should focus on the particular intelligences of each person. Gardner also points out that the different intelligences represent not only different content domains but also learning modalities of individuals (Gardner, 1993). Implication of multiple intelligences to outcome based education is that assessment of abilities should measure all forms of intelligences.

Gardner's theory of multiple intelligences proposes the following primary forms of intelligences:

- Linguistic intelligence: Learners who are sensitive to words, grammar rules and the functions of language as in writing an essay

- Musical intelligence: Learners who have the ability to hear tones, rythms and musical patterns, pitch and timbre, as in composing music

- Logical-mathematical intelligence: Learners who have the ability to see relationships between objects and solve problems, as in calculus and engineering

- Visual or spatial intelligence: learners who have the ability to perceive and mime objects in different forms or context, as in summing or impressionist painting

- Bodily-kineasthetic intelligence**:** Learners who use the body, perceptual and suitor systems in the brain to solve a problem, as in catching a bell

- Intrapersonal intelligence: Learners who have the ability to understand and define inner feelings, as in poetry and therapy

- Interpersonal intelligence: Learners who are sensitive to the actions, moods and feelings of others, as in teaching, parenting and politicking.

According to Gardner (1993) each of these intelligences can affect how learners learn and that every learner has his or her own learning style. For educators to teach effectively they need to become knowledgeable about multiple intelligences and learning styles and what they can mean in terms of learners' education. Multiple Intelligences are important because it allows for educators to identify differing strengths and weaknesses in learners.

Gardner's multiple intelligence theory provides an indication as to learners' preferred learning styles, and their behavioural and working styles and their natural strengths. Gardner (1993) argues that the types of intelligence that a person possesses indicates not only personal capabilities, but also the manner or method in which he/she prefers to learn and develop strengths and weaknesses.

When combining the theories on learning style and specially that of Herrmann, a recent study by De Boer, Du Toit, Bothma and Scheepers (in press)

A Quadrant

- Lectures
- Quantitative research projects

- Textbooks
- Case studies
- Presentations
- Use of computers

B Quadrant

- Worksheets
- Exercises with steps
- Structured problem solving
- Learning ‘laboratories’
- Well-structured activities
- Practical sessions
- Repetition/reviews

C Quadrant

- Cooperative learning
- Group discussions
- Drama
- Role play
- Learning ‘laboratories’
- Sharing ideas
- Storytelling
- Physical/kinesthetic activities
- Interviews
- Hands-on activities
- Icebreakers

D Quadrant

- Brainstorming
- Mindmapping
- Learning ‘laboratories’
- Playing games
- Visualisation

- Illustrations
- Simulations
- Discovery activities

7 Conclusion

Learning styles of learners have to be complemented by educators' styles of facilitating learning so that learners can learn effectively. Educators have to adapt to the role of facilitator so that they can be able to accommodate learners in their classes. Hence constructivists encourage educators to create learning environments that support and encourage learners' thinking. Learning style flexibility can support the accommodation of learners' learning styles. Most of the researchers (Saroyan and Snell, 1997; Ramsden, 1992; Knowles, 1990) argue that understanding of one's learning style by an educator and the learner can promote flexible learning and teaching.

CHAPTER 3
RESEARCH DESIGN

1 Introduction

In this chapter I describe the research paradigm in which my study is located and the research methods I used. I show how the research design of my study unfolded by describing the context of my study as well as the sources of data used. I then present issues of access and ethical considerations. Then I describe the data collection methods used to answer research questions and how the data was analysed. Lastly, issues of the positionality of my study and issues of validity and trustworthiness are discussed.

2 Aim and Research Questions

As is mentioned in Chapter 1, the focus of this study is to identify to what extent I make provision for accommodating learning style flexibility and educational change; to identify how I can adapt my style of facilitating learning to accommodate learners with different learning styles; to establish how I can support learners with different learning styles to become flexible and develop their full potential and how I can apply learning style flexibility in my professional development to improve my practice.

To gain a better understanding of learning style flexibility and achieve the aim of the study, the following broad research questions guided the study:

- What is my learning style?
- How can I identify learners' learning styles?
- How can I use learning style flexibility to bring about change in my facilitating of learning?

Action research Zuber-Skerritt (1992) was used because the purpose of my study is to improve my professional competence in relation to accommodating learners with different learning styles in the classroom and address the problem of division between theory and practice. I worked together with the participants.

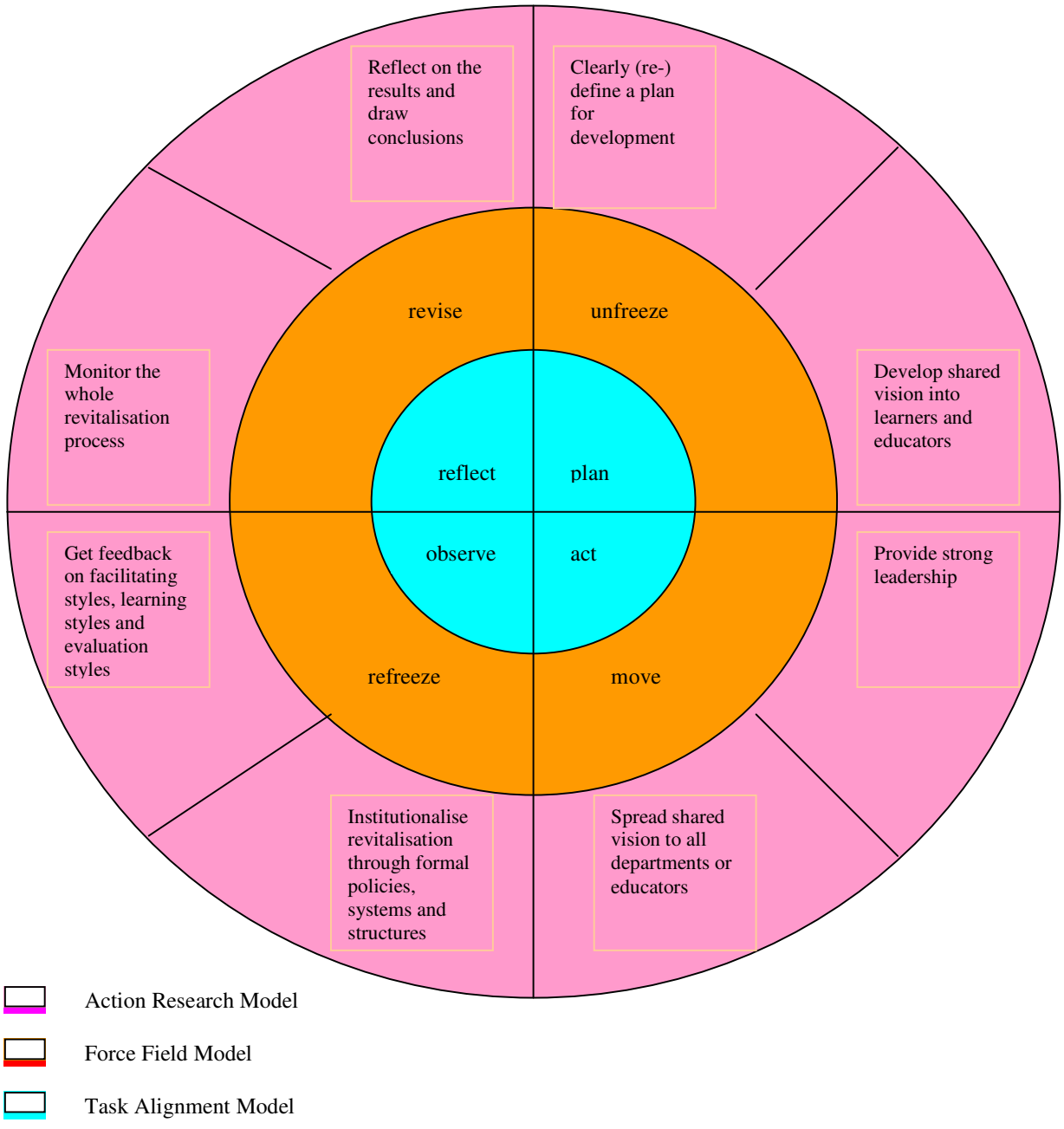
3 Research Methods

The research process used was action research as I focused on the significance of learning style flexibility in my practice with the aim of developing myself and improving my teaching practice. Action research can be defined as a systematic procedure followed by teachers (or other individuals in educational settings) to gather information about their practices and subsequently improving the ways in which their particular educational settings operate. Action research addresses a specific practical issue and seeks to obtain solutions and involves both action and research. Action research is as a spiral consisting of continuous and overlapping cycles. Each cycle is composed of the steps planning, doing, observing and reflecting. Hopkins (2001) defines action research as a personal attempt to understand, improve and reform one's practice. Action research is about the professional development of an educator and the improvement of one's practice.

Action research develops through the self-reflective spiral consisting of different cycle, each with steps of planning, acting, observing, reflecting and planning again for further implementation. This spiral is crucial in my study. Action research was used to enhance my competencies and those of learners and educators that participated in the study. Action research involves many people other than the researcher and their responses are critical in terms of collecting and interpreting data. I involved learners and peers in my research.

In my study I combined the idea of context and vision from Zuber-Skerritt's emancipatory action research model and Du Toit's (2009) asset-based model to develop myself and improve my teaching practice. Zuber-Skerritt (1992) states that action research is the individual's self-evaluation of his/her practice and in a spiral cycle and further explains the Emancipatory Action Research Model.

Figure 4: Zuber-Skerritt's emancipatory action research model

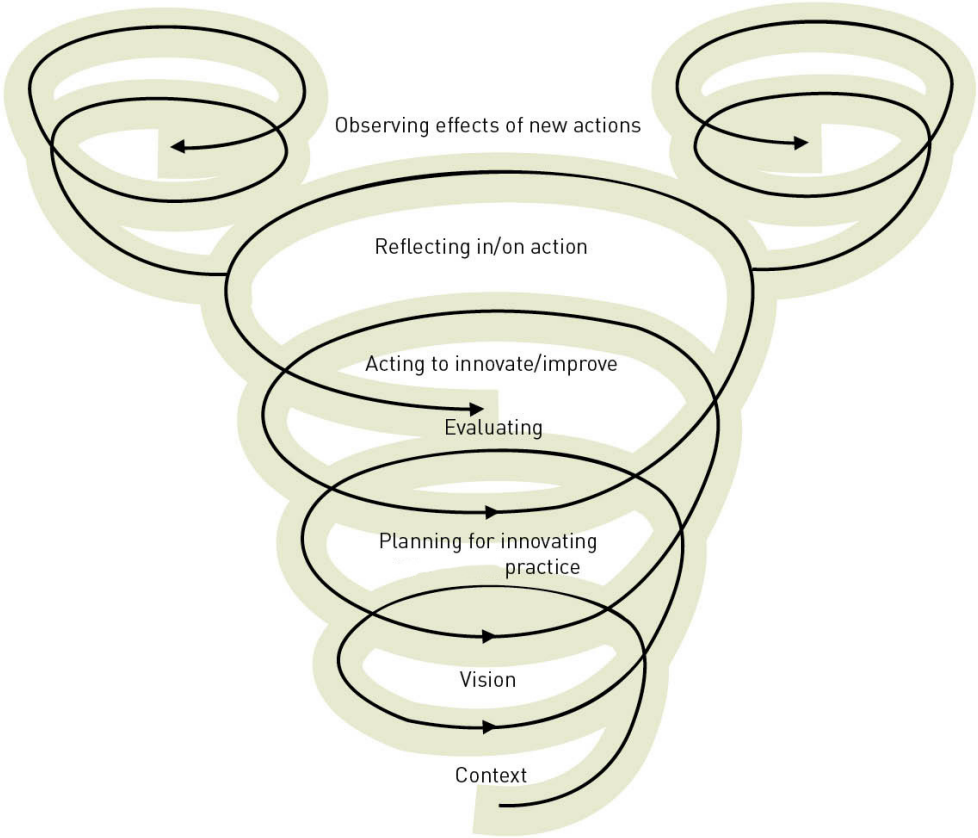


This action research model suggests a visionary approach to one's practice. It also is aligned with the leadership role each educator has. In the first place I consider myself as a visionary practitioner as I have intentionally decided to take responsibility for transforming my practice.

Such a position is considered intrapersonal leadership (Du Toit, 2009). Secondly I see myself as a leader in the college community. I have involved my peers as participants in the action research study with a view to learning from them and giving them the opportunity to learn from me. Peer mentoring promotes reciprocal learning (Du Toit, 2008). However, as leader I had to act as role-model in terms of implementing innovative ideas in my practice. The whole brain approach that I have adopted is the innovative idea as it was the first time it had been introduced to my practice specifically and the college in general.

Du Toit (2009) argues for an asset-based approach to action research opposed to a deficit approach. Knowing one's learning style is considered an asset. Du Toit's (2009) model is based on the work of McNiff and Whitehead (2006) and Zuber-Skerritt (19992). The model is represented in the following figure.

Figure 5: A visionary action research model for transforming one's practice



The two action research models above are general models and need to be contextualized and made practical in the case of any individual practice.

4 Setting up the Research Process

4.1 Methodological and epistemological stance

- *Methodology*

In action research studies the term 'research design' is often used as the overarching term instead of 'research methodology' as is to be found in traditional research studies. In the work of action research scholars such as Du Toit (2009); De Boer, Du Toit, Bothma and Scheepers (2012) and Scheepers, De Boer, Bothma and Du Toit (2011) this term is typically reflected in their action research projects. The research design *per se* is complemented by a mixed-methods approach that is sub-divided in both qualitative and quantitative methods as is the case in my study.

- *Epistemology*

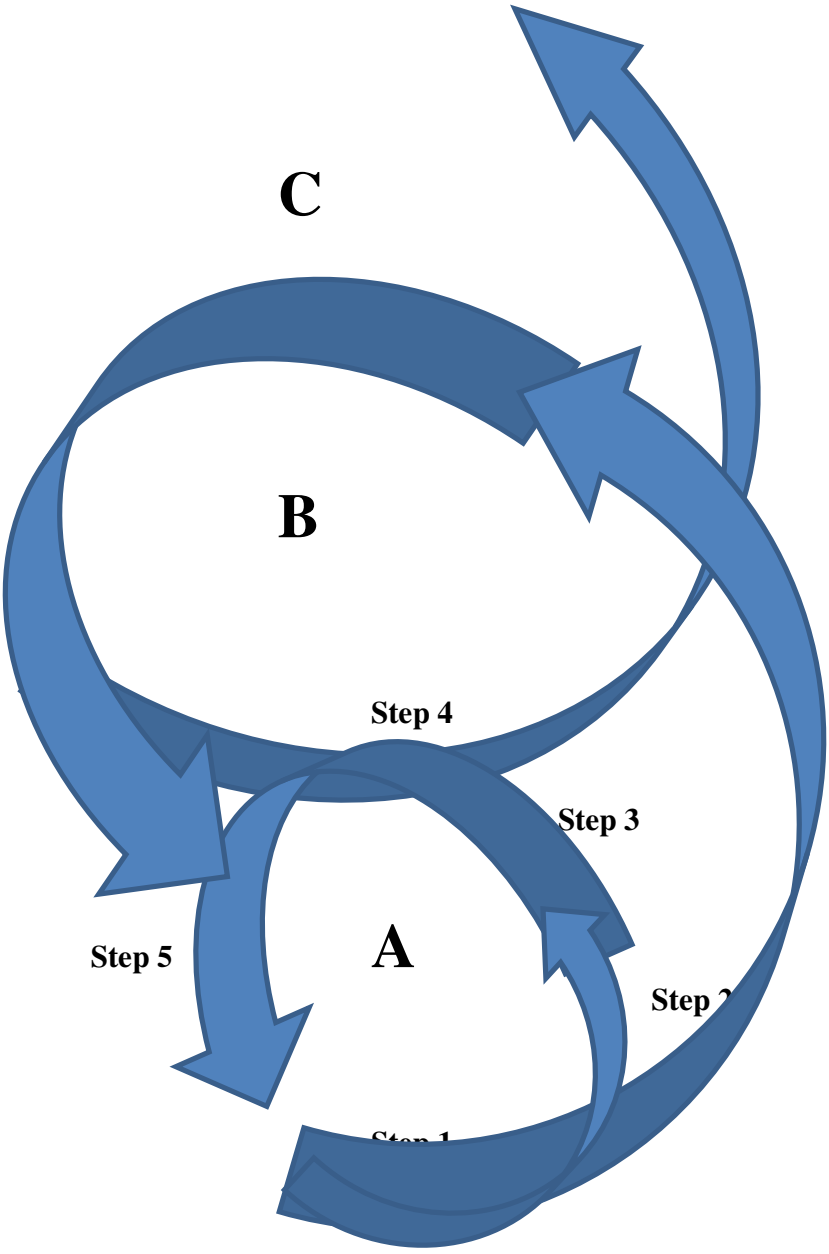
As action research is described by McNiff (2002) and McNiff and Whitehead (2006) as a process of constructing new meaning as living theory, based on lived experience, a constructivist approach (McNiff 2002) is considered an appropriate epistemological drive. Constructing new meaning as Von Glaserfeld (1995) advocates approaching one's teaching practice in a constructivist fashion supports McNiff's (2002) idea of living theory. I opted for a constructivist epistemology that allowed me to have a better understanding of what I am doing and how I live my educational values in order to not live an educational contradiction as McNiff (2002) and McNiff and Whitehead (2006) warn. Closely interlinked with this epistemology is the ontological frame of reference, namely that I do research on myself which includes self-reflection and therefore I become the ontological point of focus; central person/subject of study. As McNiff (2002) puts it: I enquire into myself; my own live; I question my actions; I question why I am the way I am – I act as practitioner researcher and the 'I' as researcher investigates the 'I' as practitioner. A construct that would fit this notion of self-enquiry (used as an overarching

term) could be described as an intrapersonal ontology. The virtue of intrapersonal enquiry can be found in the work of Herrmann (1996) on learning styles where intrapersonal development forms part of the emotional mode of learning and Gardner's (1993) work on intrapersonal intelligence – all contributing to developing my full potential as lecturer. According to McNiff (2002) action research is educational and offers numerous opportunities for professional learning. In case of my professional learning the term 'professional learning' is preferred as the term 'learning' is used in general for student learning.

Apart from the professional benefit action research has, I executed the research in a systematic and open-ended fashion as McNiff (2002) proposes in order to contribute to the current body of knowledge. Constructing meaning within the context of action research on my practice I am allowed to build on what I have studied about a phenomenon at hand and lived experience in an on-going fashion as part of creating my own practice theory.

The following figure represents the actual action research cycles that had been followed. The spiral consists of two cycles, each with its five steps of planning (step 1), acting (step 2), step 3 (observation), reflection (step 4) and evaluation (step 5)

Figure 6: Applied action research model



In brief:

- Cycle A represents the collecting of baseline data. The data consists of different sets of quantitative data. It includes the outcome of my HBDI and the hypothetical profiles

of some of my learners that demonstrates the variety of learning styles I have to accommodate and challenge.

- Cycle B reflects my first change to use action research for my professional development. It formed part of the professional portfolio I had to compile. This was done during the course-work part of the MEd qualification I am enrolled for. As I was not familiar with the principles of whole brain learning at the time, I mainly focused on a lecture type of learning opportunity in my planning and execution. As I was not familiar with the process of action research and applicable quantitative and qualitative research methods I did not expect learners to give feedback. However, four of my peers gave informal feedback by observing my session. I soon realised that my approach was not very scientific. I therefore had to re-plan to reflect a more scholarly approach.
- Cycle C represents the cycle in which I (re-) planned for implementing the principles of whole brain learning for the first time (step 1). This cycle was the impetus to move away from a 'one size fits all' approach to learning style flexibility. I implemented my innovative ideas (step 2) as a means to accommodate learners with different learning styles and to challenge those with other learning styles to become used to using other modes of learning as well.
- Next (step 3) I asked my peers for feedback, after sitting in on my classes, observing me. For this purpose an observation sheet was used. I also asked my students to give feedback by using a feedback questionnaire.
- The next step (step 4) allowed me to critically reflect on the feedback and my own experience. As the ethical clearance did not allow for having a video recording of my classes made, it is considered a limitation in terms of self-assessment which I could not do. I would have liked a more holistic approach to critical reflection.
- As last step (step 5) I could evaluate the entire process. I came to the conclusion that I have just started implementing the innovative idea of whole brain learning and that there is a lot more to learn. It means that I have to re-plan before acting in future. As action research is a cyclical process I am offered this opportunity which I gladly accept to contribute to my professional development. In the section on qualitative data I give examples of what I did to accommodate different learning styles.

4.2 Research Site

The study was conducted at Mnambithi FET College that caters for different academic and vocational courses for different learners with different needs. The College is situated in the town of Ladysmith but accommodates learners from different areas (rural and urban). The College offers courses in Business Studies, Engineering Studies, Humanity Studies, Linkages and Programmes, and Enterprise Development for the National Certificate Vocational. My study was conducted with learners taking Business Studies.

There are 36 lecturers, both male and female. All the lecturers are qualified and are comfortable with the courses they offer. The culture of teaching and learning is very effective. Classrooms are conducive to teaching and learning. Classrooms are well resourced with teaching media and learner support materials. The College responds well to the National Curriculum Statement and accommodates learners who have passed Grade 9. The College has the support of the Department of Education.

4.3 Sampling of Participants

The College was selected because I work closely with the institution by supporting learners experiencing barriers to learning. I develop support programmes for them. I work at the District Office as a Senior Education Specialist for Remedial Psychological Services. The College is conveniently situated next to the District Office. Field work means that the researcher gathers data in a setting where participants are located. For this study I was granted permission from the District Director to be at the College for four hours every day for three months in 2009 – from July to September. I was the primary research participant. However, I involved two peer lecturers and twenty learners. The class for which I offered a learning opportunity consists of 26 learners but six were not willing to be included in the study. As my study is qualitative the sampling was purposive and systematical. I wanted to keep my sample

small and as part of my own practice as I focused on personal development and the improvement of my teaching practice. Lecturers whom I selected were the ones who have been teaching for more than ten years at the College and who qualified at an Honour's level in Learner Support. I wanted to get feedback on my style of facilitating learning and how learners learn.

I selected twenty learners taking the Business Studies course. Learners were asked to give feedback on my style of facilitating learning. Learners were also expected to complete a learning style inventory so that their learning styles could be identified. Bunns cited in Cohen, Manion and Morrison (2007) argues that purposive sampling serves the real purpose of realising the researcher's objectives, namely discovering, gaining insight into and understanding of a particular chosen phenomenon, in this case learning style flexibility in teaching and learning.

4.4 Access

To conduct this study I requested permission from the KwaZulu Natal Department of Education (Othukela District) and Mnambithi FET College to conduct my research. Permission was granted in writing by both institutions. The Director of the District informed my immediate supervisor about my research project in writing so that I could be given time to conduct my research. The Rector of the College informed other collegaues about my research project in the formal staff meeting. They were all provided with the letters explaining the nature and purpose of the study and request for their participation.

I applied for ethical clearance from the Research Ethics Committee of Faculty of Education, University of Pretoria. The approval was granted, after which I started with the data collection.

4.5 Ethical Considerations

I conducted the research in an ethical manner. According to Mouton (2001) "the ethics of science concerns what is wrong and what is right in the conduct of research". I took Robson's (2002) advice that as a researcher I needed to be systematic and explicit about all aspects of

the study. According to Mouton (2001) beneficence is a major principle applicable to social research, a point I endorse. I consider research to be a public enterprise, and that it should be of social benefit, and so in this study I had to be conscious of this principle all the time.

I showed respect for the participants. My research questions avoided sensitive personal issues; the focus was on the improvement of oneself and one's teaching practice. Informed consent entails informing participants about the overall purpose on the investigation and possible risks and benefits from participating in the research. It also involves obtaining the voluntary participation of the respondent with his/her right to withdraw from the study at any time. I informed the participants that their participation was voluntary and they were free to withdraw from the research at any time. Participants were also assured that this research would not cause any harm to them. According to Cohen, Manion and Morrison (2007) "consent thus protects and respects the right of self-determination and places some of the responsibility on participants should anything go wrong in the research".

The participants were assured that information they provided would be confidential, private and anonymous. The data collected was not going to harm participants but would be used for the improvement of my teaching practice and professional development.

5 Data Collection

The data collection process lasted six months, from August 2009 to January 2010. The last semester was chosen because it was after I had defended my proposal. I wanted to understand learners' learning styles and how it can be accommodated and expanded.

Data was collected using a mix of qualitative and quantitative methods. To identify my learning style, I used the Herrmann Brain Dominance Instrument (HBDI) (Herrmann, 1996). The HBDI was answered correctly and honestly. The HBDI is a self-report instrument covering the following types of preferences and performance rating: handedness, strong and weak school subjects, work elements (e.g. administrative, innovating, teaching/training), key descriptors (verbal, emotional, factual), hobbies (e.g. fishing, photography, travel), energy level (e.g. day person, night person), motion sickness (frequency and connection with

reading), adjective pairs (forced choice, e.g. controlled/creative), introversion/extroversion (nine-point scale), questions (e.g. 'I dislike things uncertain and unpredictable'). All of these are covered by 120 items.

To identify learner's learning styles I used a simplified whole brain learning style questionnaire. The learning style questionnaire helped me in getting a sense of the dominant learning style of my learners as aligned with the four quadrants of the whole brain model. It measures which of the four quadrants a learner relies on most.

The learning style questionnaire is a simple test that helps learners to understand their likes and dislikes when it comes to learning. No single learning style entirely represents one quadrant as it is a combination of the quadrants. Understanding one's learning style type empowers a learner and helps him or her to gain the most from learning opportunities. As with the HBDI the main characteristics of the four quadrants re as follows:

- A quadrant learning means that the person favours learning activities that involve logic, analytical and fact-based information
- B quadrant learning implies a linear approach to learning activities
- C quadrant learning indicates favouring information that is interpersonal, feeling-based and that involves emotion

- D quadrant learning in mainly characterised by a holistic and conceptual approach to thinking.

Learners completed questionnaires to identify their preferred modes of learning. They had to encircle the appropriate block for each statement. Learners had to choose or encircle the best fitting answer for the statement which best describe their learning preferences. The following 5 point Lickert scale was used:

- SD = Strongly disagree (1)
- D = Disagree (2)

- N = Neutral (3)
- A = Agree (4)
- SA = Strongly agree (5)

To score their profiles learners had to add up their total scores from each quadrant by entering the totals in the chart representing the four quadrants. They then had to encircle their top scores. If there were any scores within two or three points of their top score, they should have encircled them also. The encircled quadrants are likely to represent learners' preferred

To understand how I can use learning styles to bring about change in my facilitating of learning, I used qualitative methods. I used feedback questionnaires with learners. Learners were asked to give feedback about my style of facilitating learning and how it matches their preferred way of learning. A peer feedback questionnaire completed by my colleagues and a self-assessment questionnaire were used. Peers observed me while facilitating learning. After the learning opportunity, we discussed how I facilitate learning and analysed myself as facilitator of learning.

The feedback questionnaires were also used to record how I ask questions and interact with learners during my facilitating of learning to accommodate different learners. Tow peers were asked to observe my facilitating of learning. They used the feedback questionnaire to record their observation of my learning opportunities. I later reviewed their observations and recommendations for improvement.

6 Data Analysis

Analysis of data was done qualitatively and quantitatively. As a quantitative measure I compared my learning style with learners' learning styles by identifying the number of learners who have the same learning styles and the number of those who have different learning styles. I recorded different learning styles of twenty selected learners using responses from the interviews I had had with them. I analysed the results of my HBDI profile. While I was still in the process of collecting data I started with an informal analysis as Newman (2008)

states that analysis is less a distinct final stage of research than a dimension of research that stretches across all stages. I then proceeded with qualitative data analysis to provide detailed descriptions of learning style flexibility. I studied learners' responses and feedback to understand how flexible I am in accommodating different learners.

According to Cohen, Manion and Morrison (2007) "qualitative data analysis involves organising, accounting for and explaining the data; in short, making sense of data in terms of participants' definitions of the situation, noting patterns, themes, categories and regularities". As an interpretive researcher, I used thematic content analysis. Terre'Blanche and Kelly (1999) state that "data analysis involves reading through your data repeatedly, and engaging in activities of breaking the data down (into themes and categories) and building it up again in novel ways (elaborating and interpreting)". The data I collected was arranged into themes related to different learning styles and individual preferences.

I incorporated my interpretation of learning style flexibility in discussions elsewhere in this dissertation. Factors that promote or hinder the process of learning style flexibility are discussed. I checked my interpretation of learning style flexibility by discussing it with my colleagues.

7 Trustworthiness and Validity

According to Bassey (1999) there are factors that enhance the trustworthiness of a study, such as prolonged engagement with data sources, persistent observations of emerging issues, adequate checking of raw data with their sources, sufficient triangulation of raw data, systematically testing the emerging story against the analytical statements, using a critical friend to challenge the findings, giving sufficient detail in the amount of the research and providing an adequate audit trial. Different tools that I used described what I intended to measure, namely the influence of learning style flexibility in teaching and learning. I wanted to view learning style flexibility from different angles for triangulation of my findings. Stake (2000) defines triangulation as a process of using multiple perceptions to clarify meaning and to verify the repeatability of an observation or interpretation.

To ensure validity I used the HBDI that is a validated instrument (Coffield et al, 2004). I tried to avoid subjective interpretation of data. To ensure trustworthiness I showed participants my recording of selected qualitative feedback for them to check the accuracy and trustworthiness of the raw data collected. I made my role clear to the participants that I was a researcher and a learner during this study and developed a trusting research environment.

8 Conclusion

This chapter provides the reader with the research methodology and design of the study. I gathered in-depth, rich data to answer the research questions. However, I acknowledge that I cannot generalise my findings as I used only one case study. I reduced my subjectivity and bias during data collection and data analysis. Chapter 4 focuses on the empirical data of the study. Evidence of my professional development is presented in this chapter.

CHAPTER 4
EMPIRICAL STUDY

1 Introduction

The purpose of this chapter is to present the empirical evidence of my study. To do this, I first describe the results of my learning style assessment according to the HBDI (Herrmann, 1996) in detail. Secondly, I explain a group of learners' responses to an informal Learning Style Survey of which the items are aligned with the quadrants of the whole brain model. Thirdly, I analyse responses of learners to a feedback questionnaire in terms of how I facilitate learning and how they contribute to their learning. The items of the feedback questionnaire were modified and used for the purpose of self- and peer assessment. I also include qualitative feedback from colleagues.

2 Quantitative data

2.1 Description of my Learning Style Profile

The main focus on 'learning style' and 'learning style flexibility' is on my way of thinking, learning, doing and problem solving. Determining the learning styles of the students only served as a 'benchmark' for the need to adapt my style of facilitating learning as my learning style directly influences my style of facilitating learning (teaching). Accommodating students' learning styles is one side of the educational imperative we as lecturers have; the other is challenging them to learn how to adapt to other styles of learning. This would contribute to developing their full potential. I am the initiator of the novel/innovative intervention of applying the principles of learning style flexibility in my practice for the first time. Therefore the 'learning style flexibility ' lens is used to look into what I do – a typical point of focus in action research that McNiff (2002) often refers to.

It should be made clear that the analysis of raw data of the HBDI is professionally done by Herrmann International©, the head office in the USA. I was not in a position to be involved in any statistical analyses.

This section reports the outcome of the HBDI (Appendix B). Two sets of data are reported. Firstly a table consisting of the HBDI data summary is explained (table 4.1). Secondly my HBDI profile is explained (figure 4.1). The HBDI profile sheet provides me with detail regarding the plotting of my thinking style preferences. The data summary sheet gives me a breakdown of the quadrants my responses to the questionnaire items fall into. Quadrants are explained in descending order of my preferences, namely: B>C>D>A. The thinking style quadrant I most prefer, based on my responses to the HBDI is the B quadrant, with a value of 96. Descriptors in this thinking style which I selected are *speaker*, *detailed*, *dominant* and *reader*. These descriptors represent a general overview of my thinking preferences in day to day life. Work elements related to this quadrant include *organization* and *implementation*. These elements reflect my mental preference at work.

In the C quadrant I produced a cumulative value of 96, suggesting an equal preference for this style of thinking. In this thinking style I selected *talker*, *reader*, with *emotional* representing my key descriptor – the one which describes me best. Work elements identified as ones I do well in include *teaching*, *expressing* and *interpersonal*.

My next most preferred quadrant is the D quadrant, with 59 points. In this quadrant I selected *imaginative* as descriptive of myself. Work elements I identified as ones I do well in include *integration*. My least preferred quadrant, based on my survey exposure, is the A quadrant, with a value of 50 points. In this quadrant I selected *analytical* and *rational* as characteristic of myself.

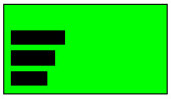
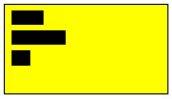
The distribution of my responses to questions into the A, B, C and D quadrants was 6-6-8-4. This suggests that there may be some shift in my thinking style when under pressure, perhaps with the last preferred quadrant becoming more dominant or the general preferred one residing into the background.

Table 1: HBDI data summary

HERRMANN BRAIN DOMINANCE INSTRUMENT
DATA SUMMARY

id: HREY3912

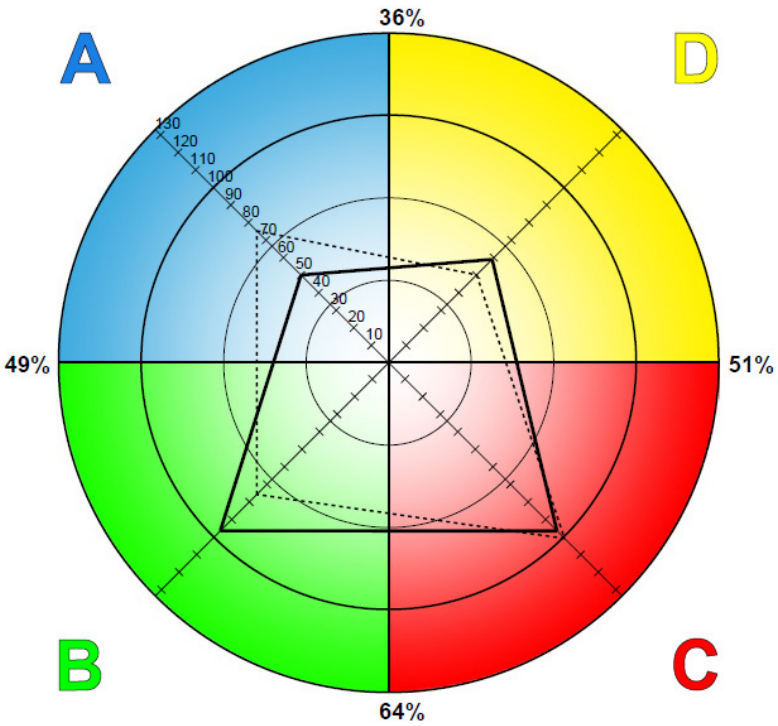
NAME	PETRUS NGOZO	GENDER	M	GROUP 86439
OCCUPATION	Principal			DATE 29 05 2008

	COLUMN A UPPER LEFT	COLUMN B LOWER LEFT	COLUMN C LOWER RIGHT	COLUMN D UPPER RIGHT
PROFILE SCORES	50	96	96	59
PREFERENCE CODE	2	1	1	2
ADJECTIVE PAIRS	6	6	8	4
KEY DESCRIPTORS (*MOST DESCRIPTIVE)	factual quantitative critical rational x mathematical logical analytical x	conservative controlled sequential detailed x dominant x speaker x reader x	emotional * musical spiritual symbolic intuitive talker x reader x	imaginative x artistic intuitive holistic synthesiser simultaneous spatial
WORK ELEMENTS	analytical 1 technical 1 problem solving 5 financial 2	organisation 5 planning 3 administrative 1 implementation 5	teaching 4 writing 2 expressing 4 interpersonal 5	integration 4 conceptualising 1 creative 3 innovating 3
ADOLESCENT EDUCATION EDUCATIONAL FOCUS OCCUPATION HOBBIES				

HAND DOMINANCE	primarily right		right some left		mixed		left some right		primarily left
	X								
ENERGY LEVEL	day				equal				night
					X				
MOTION SICKNESS	none				some				frequent
	X								
INTROVERT/EXTROVERT	introverted								extroverted
									X

Next, my HBDI profile as visually represented in figure 5 is explained.

Figure 7: My HBDI profile



My preference code is 2112. My profile is a double dominant profile with the two primaries in the B and C quadrants. It is double primary in the limbic area. My profile is characterised by very strong preferences in conservative thinking and controlled behaviour with a desire for organisation and structure as well as detail from the B quadrant. People with this profile tend to worry about details. The primary in the C quadrant would equally show itself by emotional and interpersonal preferences, an interest in music, and a sense of spirituality. It will also show in my intuitive "feelings" sense as a person. The two limbic primaries could represent an important duality to resolve within me. The opposing qualities of control and structures of "form" and the emotional and interpersonal "feelings" can cause internal conflict. The clear secondary preferences of the cerebral modes, both A and D are also characteristic of this profile, with logical and analytical in the A quadrant and holistic and creative thinking of the D quadrant. Occupations typical of people with this profile include nurses, homemakers,

secretaries and other members of "helping" professions, particularly those requiring a heavy administrative load. In terms of my current occupation as principal the latter fits well.

My most comfortable communication approaches may include step-by-step unfolding of the topic; practical answers to who, what, when, where and how; understanding how others react – a personal touch/being sensitive to others

The most natural problem solving strategies I would follow would include a step-by-step method, time line principles, intuitive feelings and team processes. To take a decision, I may ask: What is the appropriate sequence? How does my decision affect others?

2.2 Description of Learners' Learning Style Profile

To have a better understanding of learners' learning styles I used an informal Learning Style Questionnaire based on the quadrants of the whole brain model (Herrmann 1996). The reason for this is simply a matter of cost since the HBDI is scored in the USA and is very costly. Since the sample size was small, no statistical analysis would be significant. The few examples were done manually. It consisted purely of calculating the scores for the different quadrants (as indicated on the questionnaire) and then extrapolated to the HBDI profiling. It should be noted that I do not claim any content validity. It simply is done to substantiate my choice of learning style flexibility/whole brain learning.

The questionnaire (appendix B) used for learners is not at all validated. It was used to get a sense of the different learning styles that are represented in the sampled class. With the outcome of this questionnaire I was able to convince my learners of the fact that as they have their preferences I have mine and we have to accommodate one another and become adaptable. As they were made aware of this fact I could in a more scholarly way approach my practice with a view to accommodating each learner in the first place and in the second place challenge them to work beyond their preferred style of thinking.

As with the HBDI the learning style questionnaire is a simple questionnaire consisting of 24 items. Apart from content validity, since these items are based on the content of the HBDI, the questionnaire is not considered valid or reliable. It was not within the scope of this study to design a valid and reliable questionnaire, but merely to use the questionnaire as a tool to make the sample of 20 learners aware of the diversity of preferences in their class and to fulfill the purpose of informal diagnostic assessment. It also served as a playful way to obtaining metacognitive knowledge of oneself and formed an integral part of one of the learning opportunities.

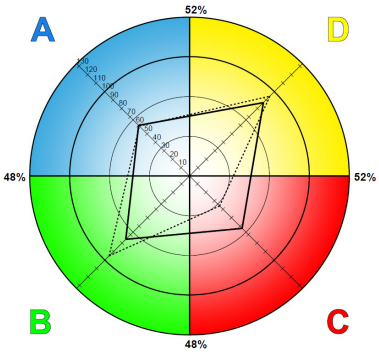
For each quadrant six statements were formulated. Respondents had to respond by indicating on a 5-point Lickert scale to what extent they agree with each statement, where 1 represents 'strongly disagree' (SD); 2 'disagree' (D); 3 represents 'neutral' (N); 4 'agree' (A) and 5 'strongly agree' (SA). The total score for each quadrant had been calculated. The highest possible score per quadrant is 30. With the small number of items (opposed to the 120 of the HBDI) the difference between the respective scores per quadrants is not that significant. Identifying the two highest scores helped in establishing the two quadrants a learner prefers most. In this way the double dominant profiles were determined. In two cases the scores for three quadrants were the same and in this way two different triple dominant profiles were identified.

Extrapolating the scores to example preference codes as listed in Herrmann (1996) assisted me in identifying typical profiles represented by learners in my class. In some cases more than one learner have similar profiles. I call it simulated profiles since the compilation of each of the profiles is not based on exact numbers and calculations – it simply represents the typicality of each. These profiles are combined in order to simulate a composite profile for the sample of 20 learners. The following table reflects the data manually gathered for identifying learners' profiles and therefore it is called simulated profiles as they merely serve as hypothetical profiles. In the table below the scores obtained from the questionnaire as they were estimated in order to transfer them to and align them with the whole brain profiling.

Table 2: Estimated scores for learner questionnaire

Respondent No	A	B	C	D
1	55	75	60	100
2	100	50	42	90
3	95	110	80	72
4	50	110	60	50
5	110	95	50	38
6	100	60	75	60
7	60	90	102	45
8	82	85	70	58
9	80	50	80	72
10	65	90	61	80

Figure 8: Simulated profile 2121

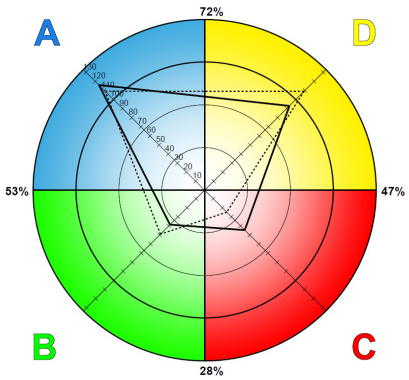


Five learners represent this double dominant profile which is diagonal (preference code: 2121). Individuals with this profile will feel distinct differences in their approach to work, communication, decision making and life experiences. On one occasion they may be quite controlled and structured (indicated by the score on the B quadrant); on another they may be quite loose and free-wheeling (indicated by the score on the D quadrant).

Communication approaches of individuals with this profile may include a step-by-step unfolding of the topic, practical answers to who, what, when, where and how, visuals and

metaphorical examples. However, individuals with this profile may overlook data and facts, technical accuracy, reference to people involvement and others' feelings.

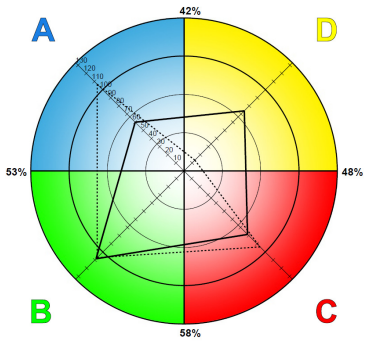
Figure 9: Simulated profile 1221



Two learners represent this double dominant profile with high scores on the A and D quadrant (preference code: 1221). Individuals with this profile would exhibit strong preferences for logical, analytical and qualitative modes of thinking as is typical of the A quadrant. Individuals with this profile frequently exhibit the ability to switch back and forth between the two quadrants, as the situation demands.

Communication approaches of individuals with this profile may include direct to the point language, clustering thinking into idea chunks using visuals and being accurate and specific. Individuals with this profile may overlook a written schedule or plan, or a people focus.

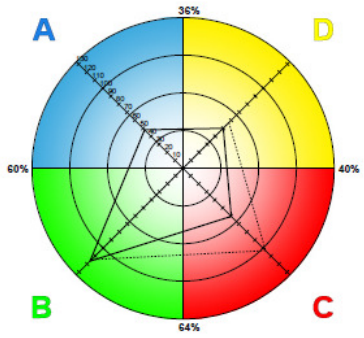
Figure 10: Simulated profile 2111



One learner has this triple dominant profile (preference code: 2111) that indicates a preference for all quadrants except the A quadrant. Individuals with this profile prefer processing modes that are creative and holistic, interpersonal and feeling-based and that include planning and organising. Quadrant A is least preferred, but still the person is quite functional in his/her use of the logical and analytical aspects of the quadrant.

Individuals with this profile are most comfortable with communication approaches that include providing an overview and involving others, a personal touch and being sensitive to others and written communication beforehand. However, technical accuracy, data and facts may be overlooked by individuals with this profile.

Figure 11: Simulated profile 2122

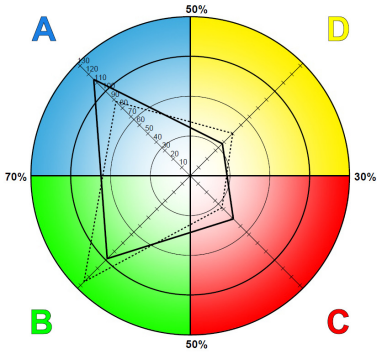


Two learners have a single dominant profile (preference code: 2122). Individuals with this profile would be characterised by strong preferences in the controlled, planning, organisational and structural modes of processing. These individuals tend to be perfectionist in terms of detail and the implementation of activities. Work that is considered most satisfying would include getting things done on time, being in control, establishing order, attending to details and safety.

Their most comfortable communication approaches may include thorough, timely and reliable follow through, references and background information, practical answers to who, what, when,

where and how, a step by step unfolding of the topic. They may, however, overlook data and facts, an overview and references to people involvement.

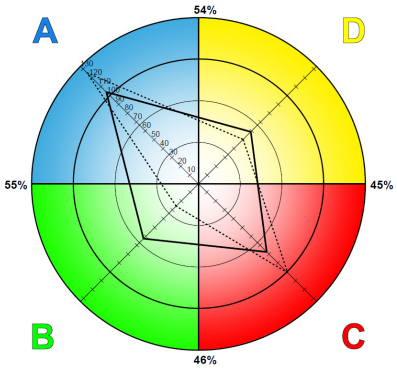
Figure 12: Simulated profile 1122



Two learners share this double dominant profile (preference code: 1122). This profile is characterised by a logical, analytical, technical orientation and is effective in rational problem solving from the A quadrant. B quadrant preferences include planning, organising, implementing and administrative activities. Work most satisfying would include accomplishing, analysing data, building things and attending to details.

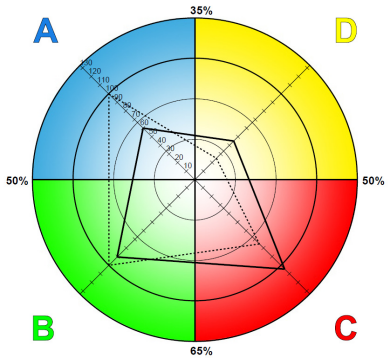
The most comfortable communication approaches may include brief clear and precise information, well articulated ideas presented in a logical format, step-by-step unfolding of the topic and explanation in writing. Individuals with this profile may overlook eye to eye contact, an overview, visuals and personal touch and informality.

Figure 13: Simulated profile 1212



Three learners share this double dominant profile which is diagonal (preference code: 1212). This profile is characterised by individuals who are very logical, analytical and rational in the thinking styles of the A quadrant, but also strongly drawn to the intuitive, interpersonal feeling aspects of the C quadrant. Work that is considered most satisfying would include putting things together, explaining things, mechanical aspects, working on a team, listening and talking. Typical communication approaches may include a good debate, well-articulated ideas presented in a logical format, reference to the people involved and eye to eye contact, but may overlook consistency, a written schedule, visuals and an overview.

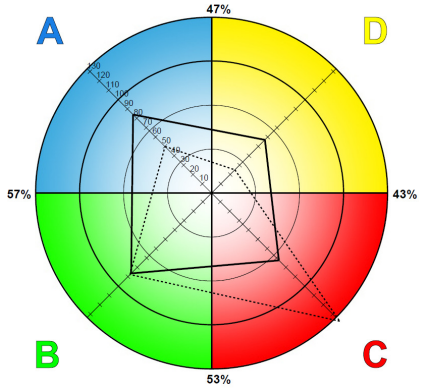
Figure 14: Simulated profile 2112



One learner has a double dominant profile in the B and C quadrant (preference code: 2112). This profile is characterised by strong preferences in conservative thinking and controlled behaviour with a desire for organisation and structures as well as detail and accuracy. Work which is considered most satisfying include getting things done on time, working with others, writing expressively, solving customer issues and building relationships.

Most comfortable communication approaches may include understanding how others will react, the personal touch, step by step unfolding of the topic, and practical answers to who, what, when, where and how. However, individuals may overlook technical accuracy, data and facts, visuals and an overview.

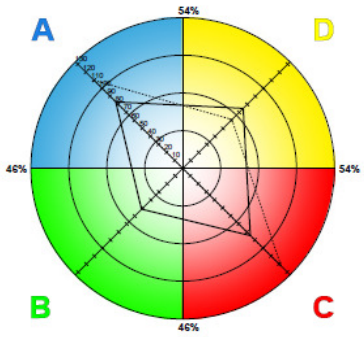
Figure 15: Simulated profile 1112



Another learner has a triple dominant profile that indicates that he/she has a preference for all the quadrants except for quadrant D (preference code: 1112). Characteristics of this profile would be analytical, rational and quantitative processing of the A quadrant, with controlled, conservative, structured and organized processing modes of the B quadrant, combined with interpersonal, emotional and spiritual aspects of the C quadrant. Work that is considered most satisfying would include analysing data, making things work, building things, establishing order, attending to details, working with people, being part of the team and solving customer issues.

Comfortable communication approaches may include brief, clear, and precise information, step by step unfolding of the topic, explanation in writing and reference to people involved. Individuals may overlook an overview, visuals and metaphoric examples.

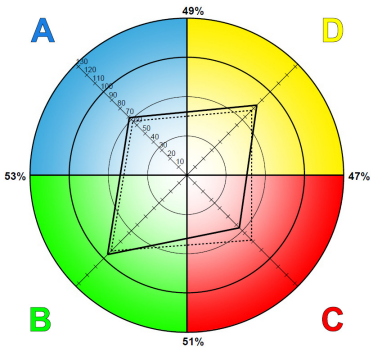
Figure 16: Simulated profile 1211



Two learners share this triple dominant profile (preference code: 1211). This is a multi-dominant profile that would be characterised by the well balanced processing modes of the A quadrant, namely analytical, logical and rational processing plus the interpersonal, emotional and intuitive thinking of the C quadrant, combined with the artistic, creative and holistic processing mode of the D quadrant. Individuals with this profile would be more experimental than safe keeping and more emotional than controlled. Work considered satisfying would include solving tough problems, explaining things, taking risks, designing, seeing the big picture, being part of the team and helping people.

The most comfortable communication approaches may include a good debate, technical accuracy, providing an overview, idea chunks, involving others and personal touch and being sensitive to others. Individuals may overlook punctuality and a written schedule and plan.

Figure 17: Simulated profile 1121



Another learner with a triple dominant profile prefers all the quadrants except the C quadrant (preference code: 1121). Descriptors of this profile would include logical, analytical and rational in the A quadrant; planning organising and administrative preferences in the B quadrant; and aspects of the D quadrant such as conceptual, holistic, creative and risk-orientated.

Most comfortable communication approaches may include brief, clear and precise information, well articulated ideas presented in a logical format, providing an overview and using visuals. Individuals may overlook eye to eye contact and personal touch and informality.

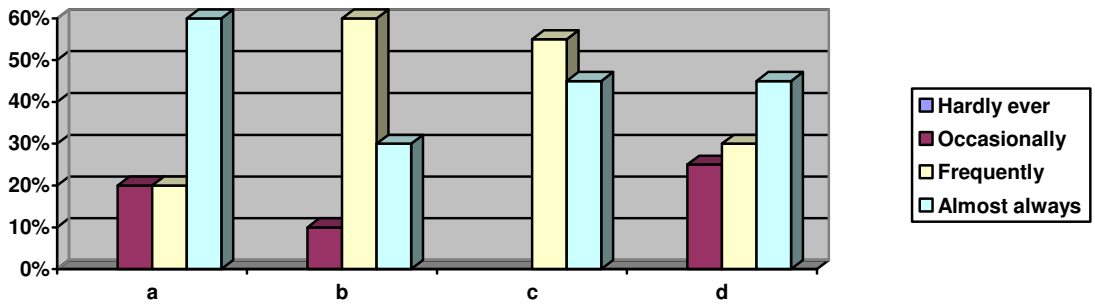
It should be kept in mind that that individuals can shift in their thinking style when under pressure, perhaps with a less preferred quadrant becoming more dominant. This so-called stress profile, as is indicated by means of the dotted line in figure 4.1 could not be determined by the questionnaire used for identifying learners' profiles.

3 Feedback from Learners and Peers

3.1 Feedback from Learners

As mentioned in chapter 3 participants to this study were two lecturers/colleagues and twenty learners. The learners were expected to respond to a feedback questionnaire on how my facilitating of learning contributes to their learning and how they as learners contribute to their own learning. The questionnaire is considered learner-centred (Du Toit, 2011). The two colleagues were expected to observe how I inspire learners to learn and initiate and maintain learning when facilitating a learning opportunity and record their observations and give feedback. For the purpose of self-assessment I responded to the same items of the feedback questionnaire. The learner feedback questionnaire provided learners the opportunity to reflect on their own learning processes and the contribution they made towards promoting a culture of learning.

Figure 18: Responses to section B category I – The facilitator inspires learners

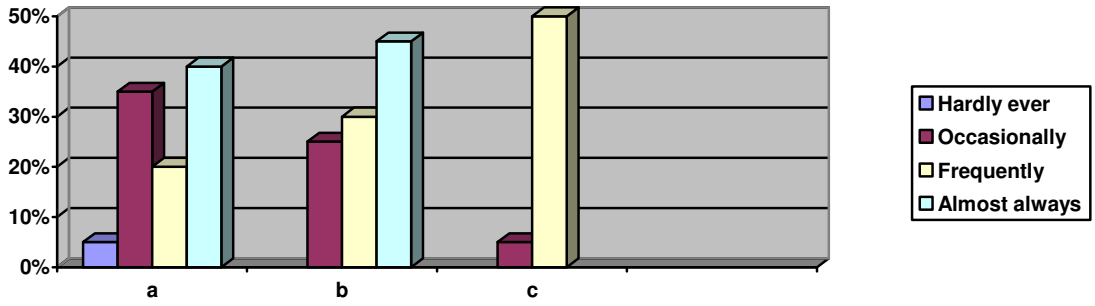


Responses for item a indicate that twelve learners (60%) are of the opinion that I almost always inspire them by showing enthusiasm about the subject matter and learning activities, while four learners (20%) indicated that I frequently show enthusiasm about the subject matter and learning activities and the remaining learners (20%) indicated that I occasionally show enthusiasm about the subject matter and learning activities. Responses for item b indicate that twelve (60%) learners are of the opinion that I frequently inspire learners by expressing myself well, while two learners (30%) indicated that I almost always express myself well; ten learners

(30%) were of the opinion that I occasionally express myself well. Responses for item c indicate that eleven learners (55%) are of the opinion that I frequently inspire them by promoting insight in the importance and significance of the subject matter and related problems/innovations and providing learning opportunities that are lively and encouraging, while nine learners (45%) were of the opinion that I frequently promote insight in the importance and significance of the subject matter and related problems. Responses for item d indicate that nine learners (45%) are of the opinion that I almost always provide learning opportunities that are lively and encouraging, while six learners (30%) indicated that I frequently provide learning opportunities that are lively and encouraging and five learners (25%) are of the opinion that I occasionally provide learning opportunities that are lively and encouraging.

Responses of learners compared to the two lecturers' responses indicate that there is a need for improvement on how I provide learning opportunities that are lively and encouraging.

Figure 19: Responses to Section B category II – The facilitator initiates learning

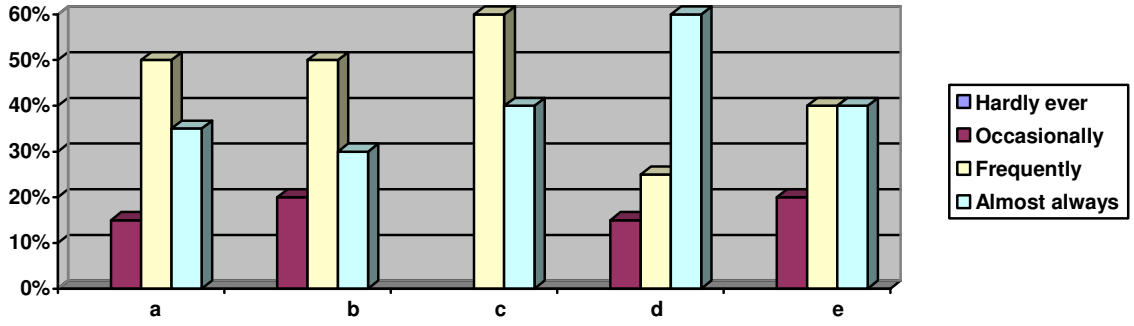


Responses to item a indicate that eight learners (40%) are of the opinion that I almost always initiate learning by creating a climate conducive to deep learning; seven learners (35%) are of the opinion that I occasionally create a climate conducive to deep learning, while four learners (20%) indicated that I frequently create a climate conducive to deep learning and one learner (5%) indicated that I hardly ever create a climate conducive to deep learning. Responses to item b indicate that nine (45%) learners are of the opinion that I almost always clearly state the purpose and learning outcomes of the session, while six learners (30%) indicated that I frequently clearly state the purpose and learning outcomes of the session and five learners

(25%) indicated that I occasionally clearly state the purpose and learning outcomes of the session. Responses to item c indicate that ten learners (50%) are of the opinion that I frequently link learning to real-life situations, while nine learners (45%) indicated that I almost always link learning to real-life situations and one learner indicated that I occasionally link learning to real-life situations.

One learner was of the opinion that I hardly ever initiated learning by creating a climate conducive to deep learning.

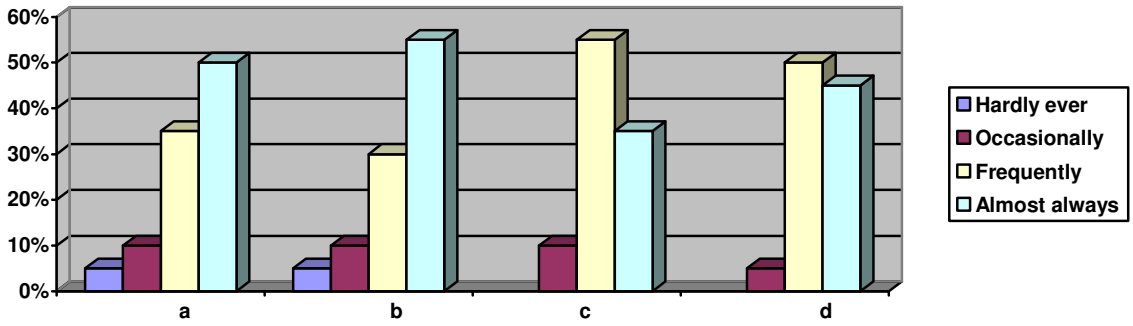
Figure 20: Responses to Section B category III – The facilitator maintains learning



Responses to **item a** indicate that ten learners (50%) are of the opinion that I frequently maintain learning by promoting facilitator-student discussions to allow learners to develop an enquiring mind, while seven learners (35%) were of the opinion that I occasionally maintained learning by promoting facilitator-student discussions to allow learners to develop an enquiring mind; three (15%) learners indicated that I hardly ever maintain learning by promoting facilitator-student discussions to allow learners to develop an enquiring mind. Responses to item b indicate that ten learners (50%) are of the opinion that I frequently encouraged learners to construct their own understanding and material, while six learners (30%) indicated that I almost always encouraged learners to construct their own understanding and material and four learners (20%) were of the opinion that I occasionally encouraged learners to construct their own understanding and material. Responses to item c indicate that twelve learners (60%) were of the opinion that I frequently provided for learning style flexibility, while eight learners (40%) indicated that I almost always provided for learning style flexibility. Responses to item

d indicate that twelve learners (60%) were of the opinion that I almost always encouraged learners to express themselves freely and openly, while seven learners (35%) were of the opinion that I almost always encouraged learners to express themselves freely and openly and five learners (25%) indicated that I frequently encouraged learners to express themselves freely and openly and three learners were of the opinion that I occasionally encouraged learners to express themselves freely and openly. Responses to item e indicate that eight learners (40%) were of the opinion that I frequently inculcated critical thinking and self-reflection, while eight learners (40%) indicated that I almost always inculcated critical thinking and self-reflection; four learners (20%) were of the opinion that I occasionally inculcated critical thinking and self-reflection.

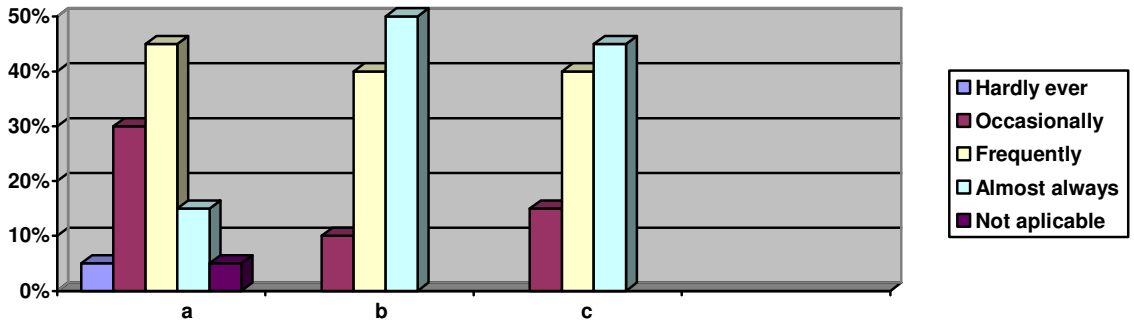
Figure 21: Responses to Section C category I – Learners' contribute to own and others' learning



Responses to item a indicate that ten learners (50%) were of the opinion that learners almost always showed enthusiasm about the subject matter and learning activities and seven learners (35%) indicated that they frequently showed enthusiasm about the subject matter and learning activities, while two learners (10%) were of the opinion that they occasionally showed enthusiasm about the subject matter and learning activities and one learner (5%) indicated that he/she hardly ever showed enthusiasm about the subject matter and learning activities. Responses to item b indicate that eleven learners (55%) were of the opinion that they almost always expressed themselves well, while six learners (30%) indicated that they frequently expressed themselves well and two learners (10%) were of the opinion that they occasionally expressed themselves well, one learner (5%) was of the opinion that he/she hardly ever expressed him-/herself well. Responses to item c indicate that eleven learners (55%) were of

the opinion that they frequently gained insight in the importance and significance of the subject matter and related problems/innovations, while seven learners (35%) were of the opinion that they almost always gained insight in the importance and significance of the subject matter and related problems/innovations, and two learners (10%) were of the opinion that they occasionally gained insight in the importance and significance of the subject matter and related problems/innovations. Responses to item d indicate that ten learners (50%) were of the opinion that they frequently participated in such a way that the learning opportunity became lively and encouraging, while nine learners (45%) indicated that they almost always participated in such a way that the learning opportunity became lively and encouraging and one learner (5%) was of the opinion that he/she occasionally participated in such a way that the learning opportunity became lively and encouraging.

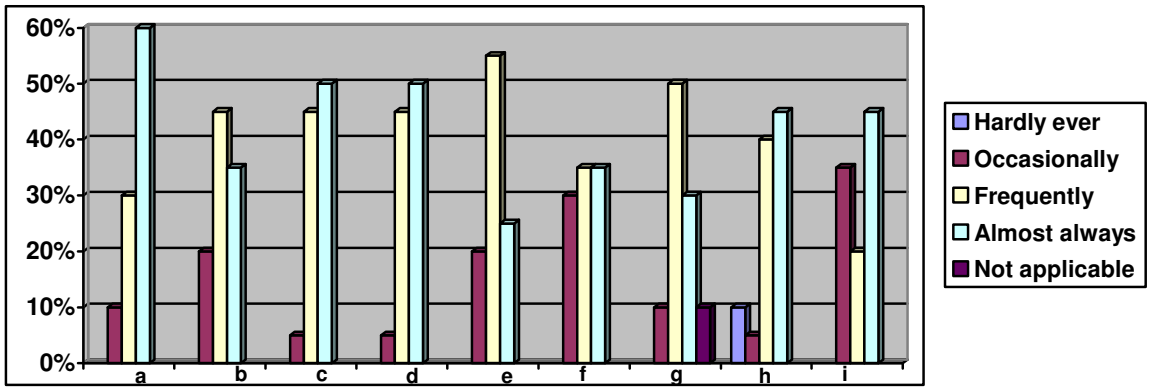
Figure 22: Responses to Section C category II – Learners co-create a climate conducive to deep learning



Responses to item a indicate that nine learners (45%) were of the opinion that they frequently co-created a climate conducive to deep learning, while three learners (15%) were of the opinion that they almost always co-created a climate conducive to deep learning and six learners (30%) indicated that they occasionally co-created a climate conducive to deep learning, and one learner (5%) indicated that he/she hardly ever co-created a climate conducive to deep learning, while one learner (5%) indicated that this item was not applicable. Responses to item b indicate that ten learners (50%) were of the opinion that they almost always attempted to link their learning to real-life situations, while eight learners (40%) indicated that they frequently attempted to link their learning to real-life situations and two

learners (10%) were of the opinion that they occasionally attempted to link their learning to real-life situations. Responses to item c indicate that nine learners (45%) were of the opinion that they almost always attempted to construct a big picture of the multidimensional nature of the session and eight learners (40%) were of the opinion that they frequently attempted to construct a big picture of the multidimensional nature of the session, while three learners (15%) were of the opinion that they occasionally attempted to construct a big picture of the multidimensional nature of the session.

Figure 23: Responses to Section C category III – Learners take part in facilitator-student discussions



Responses to item a indicate that twelve learners (60%) were of the opinion that they almost always took part in facilitator-student discussions to allow them to develop an enquiring mind and construct their own understanding and material, while six learners (30%) indicated that learners frequently take part in facilitator-student discussions to allow them to develop an enquiring mind and construct their own understanding and material and two learners (10%) were of the opinion that they occasionally took part in facilitator-student discussions to allow them to develop an enquiring mind and construct their own understanding and material.

Responses to item b indicate that nine (45%) were of the opinion that they frequently constructed their own understanding and material, while seven learners (35%) were of the opinion that they almost always constructed their own understanding and material, and four learners indicated that they occasionally constructed their own understanding and material. Responses to item c indicate that ten learners (50%) were of the opinion that they almost

always sought opportunities for developing learning style flexibility, while nine learners (45%) indicated that they frequently sought opportunities for developing learning style flexibility and one learner (5%) was of the opinion that he/she frequently sought opportunities for developing learning style flexibility. Responses to item d indicate that nine (45%) learners were of the opinion that they frequently made use of opportunities to express themselves freely and openly, while eight learners (40%) were of the opinion that they almost always made use of opportunities to express themselves freely and openly, and three learners indicated that they occasionally made use of opportunities to express themselves freely.

Responses to item e indicate that eleven learners (55%) were of the opinion that they frequently reconsidered their former attitudes and values, while five learners (25%) indicated that they almost always reconsidered their former attitudes and values and four learners (20%) were of the opinion that they occasionally reconsidered their former attitudes and values. Responses to item f indicate that seven learners (35%) were of the opinion that they almost always gained better understanding of themselves, while seven other learners (35%) indicated that they frequently gained better understanding of themselves and six learners (30%) indicated that they occasionally gained better understanding of themselves. Responses to item g indicate that ten learners (50%) were of the opinion that they frequently developed a greater sense of responsibility, while six learners (30%) were of the opinion that they almost always developed a greater sense of responsibility and two learners (10%) indicated that they occasionally developed a greater sense of responsibility, while two other learners (10%) indicated that the item was not applicable.

Responses to item h indicate that nine learners (45%) were of the opinion that they almost always contributed to their peers' learning, while eight learners (40%) were of the opinion that they frequently contributed to their peers' learning and one learner (5%) indicated that he/she occasionally contributed to his/her peers' learning, while two learners (10%) were of the opinion that they hardly ever contributed to their peers' learning. Responses to item i indicate that nine learners (45%) were of the opinion that they almost always sought to inculcate critical thinking and self-reflection, while four learners (20%) were of the opinion that they frequently sought to inculcate critical thinking and self-reflection and seven learners (35%) indicated that they occasionally sought to inculcate critical thinking and self-reflection.

4 Qualitative feedback

4.1 Feedback from peers

Feedback from my two colleagues/lecturers on how I inspired learners indicates that I frequently inspired learners by showing enthusiasm about the subject matter and learning activities, occasionally expressed myself well. I occasionally inspired learners by promoting insight in the importance and significance of the subject matter and related problems/innovations. I almost always provided learning opportunities that were lively and encouraging for learners.

My colleagues' feedback on how I initiated learning indicates that I frequently initiated learning by creating a climate conducive to deep learning. I almost always clearly stated the purpose and learning outcomes of the session. I frequently linked learning to real-life situations.

Feedback from my colleagues indicated that I frequently maintained learning by promoting facilitator-student discussions to allow learners to develop an enquiring mind. I frequently encouraged learners to construct their own understanding and material. I occasionally maintained learning by providing learning style flexibility and encouraging learners to express themselves freely and openly. I frequently inculcated critical thinking and self-reflection.

The two lecturers' feedback on how learners contributed to their own and others' learning indicates that learners frequently showed enthusiasm about the subject matter and learning activities. Learners frequently expressed themselves well. Learners' frequently contributed to their own learning by gaining insight in the importance and significance of the subject matter and related problems/innovations. Learners frequently contributed to their own learning by participating in such a way that the learning opportunity became lively and encouraging.

Feedback by the lectures indicates that learners frequently co-created a climate conducive to deep learning and almost always attempted to link their learning to real-life situations. Learners frequently attempted to construct a big picture of the multidimensional nature of the session.

Feedback by the lecturers indicates that learners frequently took part in facilitator-student discussions to allow them to develop an enquiring mind and frequently constructed their own understanding and material. Learners almost always made use of opportunities to express themselves freely and openly and gained better understanding of themselves. Learners frequently sought opportunities for developing learning style flexibility, i.e learning in different ways, not only according to their own preference. Learners frequently reconsidered many of their former attitudes and values, occasionally sought to inculcate critical thinking and self-reflection. Learners frequently contributed to their peers' learning and developed a greater sense of responsibility.

Narrative data was obtained from lecturers who observed my facilitating of learning on three occasions. My peers had to write down what they have observed in my class. The learners responded to the feedback questionnaire and made general comments to support their responses and those responses were compared to my peers' comments based on their observations.

According to my peers I plan learning opportunities to accommodate the learners in my class. Both reported that outcomes are communicated with the learners so that they know what is expected of them. As opposed to the comments by my peers the learners feel that I don't involve them in my planning and if I can involve them my learning opportunities can be more interesting. I encourage the learners to ask questions during learning opportunities. I could involve the learners in my planning of learning opportunities, so that they can be accommodated.

The learners' comments on how I use group work indicate that I don't like to use groups but I prefer to give the learners individual attention. My peers reported that I use groups, but not effectively because I make the learners to work in pairs. If I reflect on how I use groups I can see that my learning opportunities do not encourage group work but I focus on supporting the learners individually. I should work on my usage of groups to help the students achieve the desired learning outcomes.

Both the learners' and my peers' comments indicate that I assess learners continuously during and after a learning opportunity to monitor their understanding. Learners are comfortable with my assessment style as it gives them opportunity to do self-assessment. I can use assessment to make changes on how I facilitate learning to the class and understanding learners better.

Comments by my peers indicate that my relationship with the learners is good. The learners are open to me and feel free to ask questions during learning opportunities. I give the learners individual attention which makes them feel accommodated and wanted. The learners' comments indicate that I motivate and discipline them constantly. I encourage them to be responsible for their learning. I have to motivate the learners to understand their learning style and use the knowledge for their learning.

4.2 Self-assessment

For self-assessment on how I facilitated learning effectively in collaboration with learners I modified the feedback questionnaire. My self-assessment on how I inspired learners, indicates that I frequently inspired learners by showing enthusiasm about the subject matter and learning activities, occasionally expressed myself well. I almost always inspired learners by promoting insight in the importance and significance of the subject matter and related problems/innovations.

I frequently provided learning opportunities that were lively and encouraging for learners. I almost always initiated learning by creating a climate conducive to deep learning and clearly stating the purpose and learning outcomes of the session. I frequently linked learning to real-life situations.

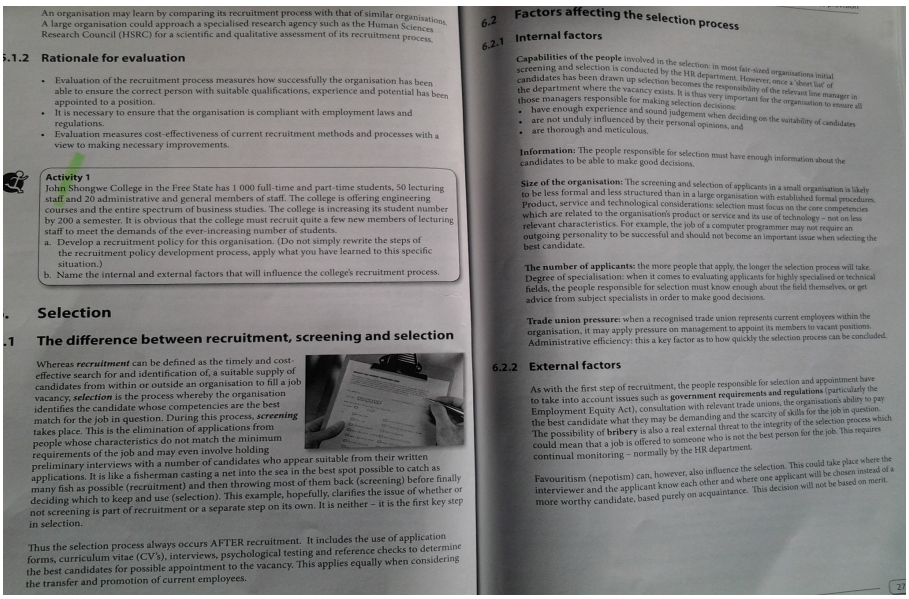
I frequently maintained learning by promoting facilitator-student discussions to allow learners to develop an enquiring mind. I almost always encouraged learners to construct their own understanding and material. I almost always maintained learning by providing learning style flexibility and encouraging learners to express themselves freely and openly. I frequently inculcated critical thinking and self-reflection.

My assessment on how learners contributed to their own and others' learning indicates that learners frequently showed enthusiasm about the subject matter and learning activities. Learners frequently expressed themselves well. Learners' frequently contributed to their own learning by gaining insight in the importance and significance of the subject matter and related problems/innovations. Learners almost always contributed to their own learning by participating in such a way that the learning opportunity became lively and encouraging.

Learners occasionally co-created a climate conducive to deep learning and frequently attempted to link their learning to real-life situations. Learners occasionally attempted to construct a big picture of the multidimensional nature of the session. Learners occasionally took part in facilitator-student discussions to allow them to develop an enquiring mind and frequently constructed their own understanding and material. Learners frequently made use of opportunities to express themselves freely and openly and frequently gained better understanding of themselves. Learners frequently sought opportunities for developing learning style flexibility, i.e learning in different ways, not only according to their own preference. Learners frequently reconsidered many of their former attitudes and values, almost always sought to inculcate critical thinking and self-reflection. Learners frequently contributed to their peers' learning and occasionally developed greater sense of responsibility.

The following discussion complements cycle B of the action research model implemented action research model. In order to accommodate fact-based learners (quadrant A) I presented lectures. Sequential learning (quadrant B) was accommodated by using structure in my learning opportunities and using the prescribed text book that is very structured and outlined. The following visual is an example of this. At the same time the text book consists mainly of text, which represents fact-based learning (A quadrant). In some instances the text book reflects visual material but it is very limited and does not support my attempts to promote visual learning. In addition to the few visuals in the text book I make use of visuals in my classroom to accommodate learners from quadrant D.

Figure 24: Visual from text book



An organisation may learn by comparing its recruitment process with that of similar organisations. A large organisation could approach a specialised research agency such as the Human Sciences Research Council (HSRC) for a scientific and qualitative assessment of its recruitment process.

5.1.2 Rationale for evaluation

- Evaluation of the recruitment process measures how successfully the organisation has been able to ensure the correct person with suitable qualifications, experience and potential has been appointed to a position.
- It is necessary to ensure that the organisation is compliant with employment laws and regulations.
- Evaluation measures cost-effectiveness of current recruitment methods and processes with a view to making necessary improvements.

Activity 1

John Shongwe College in the Free State has 1 000 full-time and part-time students, 50 lecturing staff and 20 administrative and general members of staff. The college is offering engineering courses and the entire spectrum of business studies. The college is increasing its student number by 200 a semester. It is obvious that the college must recruit quite a few new members of lecturing staff to meet the demands of the ever-increasing number of students.

a. Develop a recruitment policy for this organisation. (Do not simply rewrite the steps of the recruitment policy development process, apply what you have learned to this specific situation.)
b. Name the internal and external factors that will influence the college's recruitment process.

. Selection

.1 The difference between recruitment, screening and selection

Whereas ***recruitment*** can be defined as the timely and cost-effective search for and identification of, a suitable supply of candidates from within or outside an organisation to fill a job vacancy, ***selection*** is the process whereby the organisation identifies the candidate whose competencies are the best match for the job in question. During this process, ***screening*** takes place. This is the elimination of applications from people whose characteristics do not match the minimum requirements of the job and may even involve holding preliminary interviews with a number of candidates who appear suitable from their written applications. It is like a fisherman casting a net into the sea in the best spot possible to catch as many fish as possible (recruitment) and then throwing most of them back (screening) before finally deciding which to keep and use (selection). This example, hopefully, clarifies the issue of whether or not screening is part of recruitment or a separate step on its own. It is neither – it is the first key step in selection.

Thus the selection process always occurs AFTER recruitment. It includes the use of application forms, curriculum vitae (CV's), interviews, psychological testing and reference checks to determine the best candidates for possible appointment to the vacancy. This applies equally when considering the transfer and promotion of current employees.

6.2 Factors affecting the selection process

6.2.1 Internal factors

Capabilities of the people involved in the selection: in most fair-sized organisations initial screening and selection is conducted by the HR department. However, once a 'short list' of candidates has been drawn up selection becomes the responsibility of the relevant line manager in the department where the vacancy exists. It is thus very important for the organisation to ensure all those managers responsible for making selection decisions:

- have enough experience and sound judgement when deciding on the suitability of candidates
- are not unduly influenced by their personal opinions, and
- are thorough and meticulous.

Information: The people responsible for selection must have enough information about the candidates to be able to make good decisions.

Size of the organisation: The screening and selection of applicants in a small organisation is likely to be less formal and less structured than in a large organisation with established formal procedures.

Product, service and technological considerations: selection must focus on the core competencies which are related to the organisation's product or service and its use of technology – not on less relevant characteristics. For example, the job of a computer programmer may not require an outgoing personality to be successful and should not become an important issue when selecting the best candidate.

The number of applicants: the more people that apply, the longer the selection process will take.

Degree of specialisation: when it comes to evaluating applicants for highly specialised or technical fields, the people responsible for selection must know enough about the field themselves, or get advice from subject specialists in order to make good decisions.

Trade union pressure: when a recognised trade union represents current employees within the organisation, it may apply pressure on management to appoint its members to vacant positions.

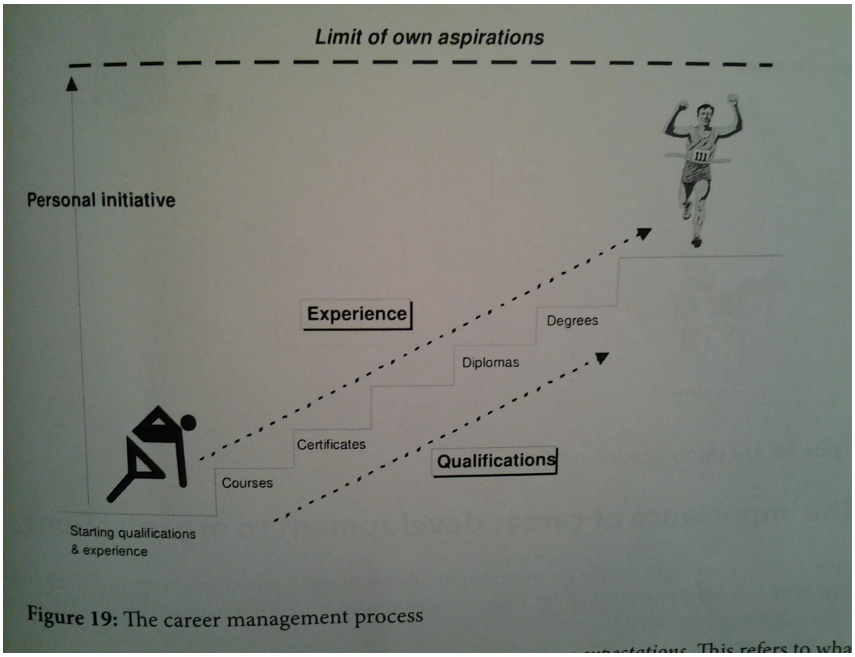
Administrative efficiency: this a key factor as to how quickly the selection process can be concluded.

6.2.2 External factors

As with the first step of recruitment, the people responsible for selection and appointment have to take into account issues such as **government requirements and regulations** (particularly the Employment Equity Act), consultation with relevant trade unions, the organisation's ability to pay the best candidate what they may be demanding and the scarcity of skills for the job in question. The possibility of **bribery** is also a real external threat to the integrity of the selection process which could mean that a job is offered to someone who is not the best person for the job. This requires continual monitoring – normally by the HR department.

Favouritism (nepotism) can, however, also influence the selection. This could take place where the interviewer and the applicant know each other and where one applicant will be chosen instead of a more worthy candidate, based purely on acquaintance. This decision will not be based on merit.

Figure 25: Visual from textbook



To accommodate learners who prefer a personal touch to learning (C quadrant) I often expected them to engage in group work. The assignments in the text book accommodates this mode f learning to some extent. Another limitation in terms of ethical clearance is that I was not allowed to take photographs of students. This would have allowed me to include photo evidence in my empirical study. Next an example of a group assignment is given.

Table 3: Example of activity from the textbook

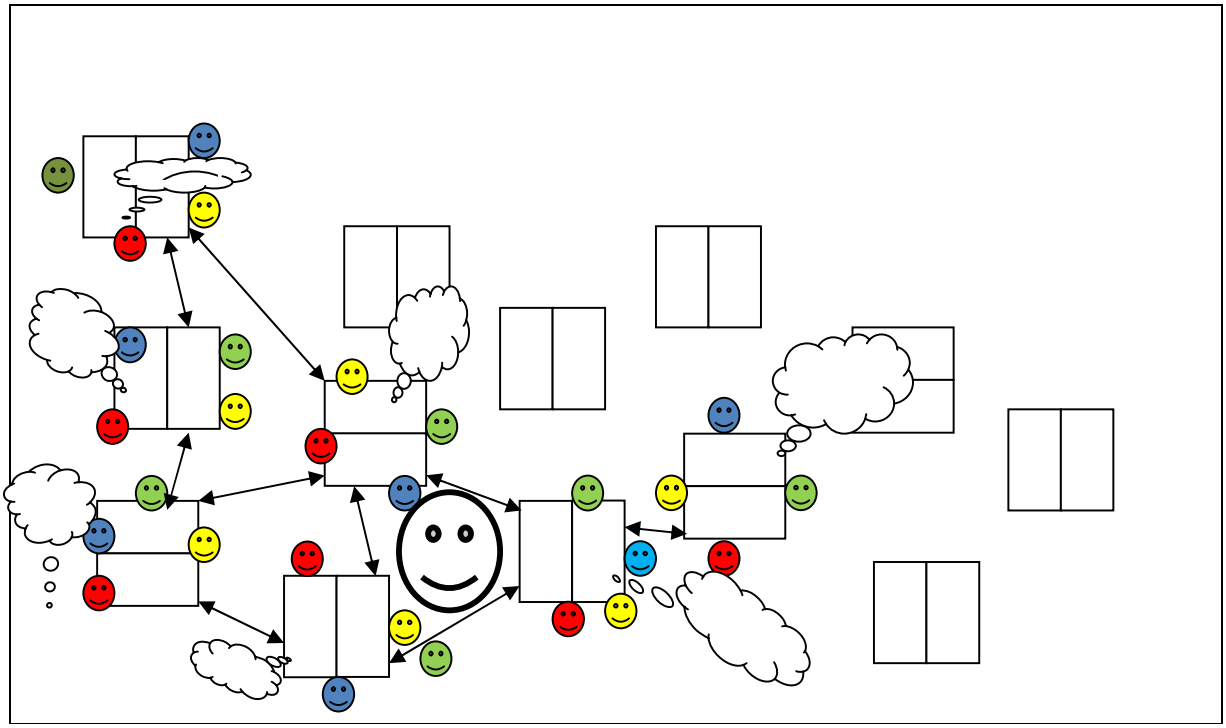
ACTIVITY 1 (Group work)
John Shongwe College in the Free State has 1 000 full-time and part-time students, 50 lecturing staff and 20 administrative and general members of staff. The college is offering engineering courses and the entire spectrum of business studies. The college is increasing its student number by 200 a semester. It is obvious that the college must recruit quite a few new members of lecturing staff to meet the demands of the ever-increasing number of students.

a. In a group develop a recruitment policy for this organization. (Do not simply rewrite the steps of the recruitment policy development process, apply what you have learned to this specific situation.)

b. Name the internal and external factors that will influence the college's recruitment process.

As I do not have photo evidence of my class activities, the next visual reflects my approach to group work *per se* as whole brain-based, learning-centred and collaborative. Two tables are joined. As far as possible, based on my knowledge of students and their reaction during learning opportunities, I divide the groups hypothetically into groups of four, represented by the four quadrants. It shows two-way communication by all participants. As is typical of FET colleges classes are not overcrowded, as is the case with my classes that consists of 20 students only. The next schematic representation portrays this.

Figure 26: Schematic representation of cooperative learning



The tables are placed in such a way that even space for each learner is created. The faces represent the learners. Each group consists of learners from all quadrants. As facilitator I am depicted by the larger face. My positioning on the visual indicates that I move around between groups to facilitate learning. The arrows represent the interactive communication between groups and the callouts the brainstorming or collaborative thinking and doing.

As I am a part-time lecturer at the college (another limitation to the study) I initiated self-regulated learning and constructivist learning. Constructivist and self-regulated learning are closely linked to cooperative learning in that cooperative learning offers the opportunity to learn from others in an interdependent and whole brain fashion. This is done with a view to nurture the learner to become a self-directed independent learner. As my colleagues did not know about the principles of these theories I acted as role-model and gave them the chance to learn by observing.

Aligned with what is explained in the theoretical part of this study my goal was to work from a constructivist point of view that expects me to considering how to facilitate learning by acknowledging that no two learners learn in the same way. Furthermore, I consider that the responsibility of learning should reside increasingly with the learner (Von Glaserfeld, 1995). According to the social constructivist approach, I have to adapt to the role of facilitators and not teachers. Where a teacher gives a didactic lecture which covers the subject matter, I as facilitator navigate the learner in getting to his or her own understanding of the content and mastering of learning outcomes. A teacher tells, I as facilitator ask; a teacher lectures from the front, I as facilitator support from the back; a teacher gives answers according to a set curriculum, as facilitator I provide guidelines and create the environment for the learner to arrive at his or her own conclusions; a teacher mostly gives a monologue, as facilitator I continuously dialogue with the learners.

For learners to maximise their learning potential, educators are expected to use more than one style to facilitate learning (direct instruction, collaborative learning, inquiry learning, etc). According to the constructivist learning theory, it is expected of me to implement a variety of learning styles throughout the learning opportunity to allow all learners to have the chance to learn in at least one way that matches their learning styles. I attempted applying the principles of constructivism as it is a theory of knowledge creation which expects me to allow my learners to generate knowledge and meaning from their experiences by incorporating the new experiences into an already existing framework (Piaget, 1973). Implementing the principles of constructivist learning challenged me to offer opportunities in which individual learners could create or construct their own new understanding through the interaction of what they already know and believe and the ideas, events and activities with which they come in contact. My learning activities in a constructivist setting are characterised by active engagement, enquiry, problem solving and collaboration with others. In my constructivist setting I acted as guide, facilitator and co-explorer who encourages learners to question, challenge and formulate their own ideas, opinions and conclusions.

Constructivist theorists (Vygotsky, 1978) encouraged me to create a learning environment that can support and challenge learners' thinking. This meant that I could not choose just one style of facilitating learning (direct instruction, collaborative learning, inquiry learning, etc), as

learners would not be able to maximise their learning potential. Since I could accommodate a variety of learning styles during a learning opportunity my learners were offered the chance to learn in more than one way that matches their learning style, although constructivists argue for at least one way to accommodate learners. Constructivist learning theorists (Vygotsky, 1978) further argue that the best way for learners to learn is by constructing their own knowledge instead of having someone constructing it for them which I did during cooperative learning opportunities. By means of cooperative learning they were actively involved in the learning process. I adapted the learning experience by using learners' initiative in order to direct the learning experience to where the learners want to create value. I motivated the learners to learn and sustain motivation to learn independently – but first supported by learning with others. Motivating my learners to become effective and self-efficient learners had as goal the possibility to manage his/her learning using learning styles he/she is comfortable with and be able to support other learners.

5 Conclusion

In this chapter, data sets are presented in order to describe and explain my learning style flexibility and its influence on my facilitating of learning. This chapter further attempts to explore factors promoting and those that hindered my promotion of learning style flexibility in teaching and learning. This empirical study discovered that both I and learners are multiple intelligent and have the potential to adapt to different learning styles and how learners can use their learning styles to contribute to their own learning. The study also discovered that each learner has a most preferred learning style that informs his/her learning. Some learners have single dominant profiles, while others have double or triple dominant profiles. Collaboration between learners and me promote effective learning. I can accommodate learners' different learning styles in their facilitating of learning by involving learners and clearly stating the purpose and learning outcomes of the session.

Chapter 5 outlines the findings and conclusions of the study.

CHAPTER 5
FINDINGS AND CONCLUSION

1 Introduction

The study aimed at identifying how learning style flexibility influences teaching and learning. Three research questions were formulated to identify this. Two peers and twenty learners from a Further Education and Training College were the participants. In order to answer my research questions, I used action research with the focus on my teaching practice. The process was conducted through intra-reflection as well as opportunities for reflection with peers. Action should be taken by the practitioner after self-reflection with a group in order to improve rather than simply repeat the previous patterns. I used Du Toit's asset-based model of action research to examine my questions as it develops in a spiral shape.

The purpose of this chapter is to summarise the findings of the study as they relate to my research questions. This chapter outlines the reflections on methodology, the practice of learning style flexibility and flexibility in facilitating learning. Recommendations are sketched and the chapter culminates in suggested areas for further research.

2 Summary of Findings

My findings illustrate that knowledge of the individual's preferred thinking style is important for the individual to know himself/herself better and become more flexible in recognising and solving problems. Learning style flexibility is capable of enhancing teaching and learning, including the achievement of complex learning outcomes that include attitudes and traits. This becomes evident when an educator understands that learners in a class have different learning styles and prepares learning activities with a view to accommodating learners' preferred thinking styles. Hence I agree with scholars such as Gardner (1993) and with the *Norms and Standards for Educators* (DoE, 2000) that encourage educators to recognise the fact that learners possess different or multiple intelligences that should be accommodated in the

classroom during facilitating learning. An important finding is that if educators move away from a content-driven learning approach to learner-centred approaches that allow learners to discover and construct knowledge on their own, learning style flexibility and educational change are possible (Slabbert, 2006).

Educators are expected to facilitate learning, initiate learning and ensure that learners keep on learning until the highest possible quality of learning has been achieved. Therefore learning style flexibility will benefit learning as learners' different preferences are taken into account. Learning style flexibility can promote change from lecturer-centredness to learner-centredness. Learner-centred facilitating of learning gives learners the opportunity to regulate their learning and construct meaning using their preferred thinking styles. Learners who are able to structure their own content by using different learning styles are flexible in their processing of information. Instructional strategies such as co-operative learning and self-regulated learning support and encourage flexibility in learning and in processing of information. Hence I agree with Slabbert (2006) when he argues that the kind of required education should be learner-centred.

My findings further indicate that if learners know and understand their learning styles, it would contribute to becoming lifelong learners who are confident, independent, and compassionate and have the ability to participate in society as critical thinkers and active citizens. My findings confirm the argument that no two people can learn the same things, nor will they learn in the same way, even in the same situation. This is because different people have different styles of learning, Therefore educators should be able to use their learning styles to accommodate learners' different learning styles in facilitating learning.

My findings indicate that there are many definitions of learning style. For my study I prefer to use the term learning style as an indication of how learners prefer to learn and as a person's preferred approach to learning, which may be an important determinant of academic performance. Therefore, for my study I conclude that learning style is an individual's way of processing and interpreting information for effective learning and understanding.
My findings further indicate that the learning style, teaching style and personality style of educators have an impact on how learning takes place. Educators facilitate learning according

to their learning styles without accommodating learners' learning styles. If educators know and understand their learning styles they will be able to accommodate learners' learning styles in facilitating learning. I can confirm this finding because since I started using the Herrmann Brain Dominance Instrument (HBDI) to identify my learning style, my facilitating of learning has changed positively. I prepare learning activities with a view to accommodating learners' learning styles and different profiles in the class and almost always inspire learners by creating a climate conducive to deep learning. I frequently maintain learning by promoting facilitator-learner discussions to allow learners to develop enquiring minds.

Learners have different thinking style preferences but can share profiles. This was confirmed by the analysis of learners' responses to a learning style questionnaire. This fact presents a challenge to educators as they are expected to understand and teach learners with different personalities and learning styles in one class. It is expected of an educator to be an agent of change. This can be achieved if learners are motivated to learn and accept responsibility for the success of their own studies. My findings confirm the findings of Von Glaserfeld (1995) that learners must be motivated to learn and that motivation should be sustained. Motivated learners become effective and self-efficient learners who can manage learning, using a learning style they are comfortable with.

Constructivism supports Kolb's (1984) experiential learning theory by encouraging learners to construct their own meaning during learning. Kolb's model of learning style is supported by Herrmann's four quadrant whole brain model, which focuses on the left and right hemisphere of the brain. Both models stipulate clear expectations for learners relating to their thinking preference. Therefore they agree that educational activities should be structured in a way to incorporate the preferences of the learners in all four quadrants for learners' full potential to be developed. Scholars such as Ramsdan (1992) and Knowles (1990) support Herrmann's whole brain learning for all learners. Educationists have to structure the content and formulate learning outcomes, and the design and delivery of any learning activity in such a way that it is whole brained in order to meet the diverse thinking and learning styles of learners.
My findings further indicate that Herrmann's whole brain teaching and learning (1995) theory together with Kolb's (1984) stance on learning style accommodates the multiple intelligences of Gardner. Multiple intelligences can help an educator to account for a broader range of

learners in the classroom and to accommodate their learning styles. Multiple intelligences do not only represent different content domains; they also represent the learning modalities of individual learners. Therefore educators should understand and find out more about multiple intelligences and learning styles so that their planning of learning opportunities is meaningful to learners. I recommend that learners' learning styles should be complemented by educators' facilitating style to ensure effective teaching and learning.

3 Reflection on Methodology

My study takes the form of both quantitative and qualitative action research of my professional development and my practice. Using action research helped me to identify the extent to which the education system accommodates learning style flexibility and educational change. Action research is conducive to my professional development and the understanding of my learning style in relation to learners' learning styles and how I can accommodate learners in facilitating learning.

Action research was the appropriate method for my study, because it helped me to reflect constantly and plan how I can accommodate learners' learning styles and support learners to achieve their full potential. Through action research I am able to develop myself and improve my practice as it develops in a spiral of cycles. Zuber-Skerritt (1992) confirms that action research is an individual's self-evaluation of his/her practice and who engages in participatory problem-solving and continuous professional development in a spiral.

My sample of two peers, twenty learners and myself as participants constituted a limitation to the study as it was a small sample. The study focuses on the identification of my learning style, learners' learning styles and how I can accommodate learning styles in my facilitating of learning and assessment for the improvement of my profession. Therefore the findings cannot be generalised to other practices.

A further limitation was conducting research at a college that I was not based at full-time. I could have been subjective as I was familiar with what was happening at the college which I

support with the development of support programmes for learners experiencing barriers to learning. I could have ignored some information on learning style flexibility.

When I analysed data or responses I realised that there were questionnaires in which I should have asked for further explanation, as I had a personal perspective on them. I should have used interviews to gather more data. Furthermore, my participation as the district official may have caused the participants to perceive me as having more knowledge than they did. Therefore they may have told me what they thought I was looking for rather than what was really happening. Fortunately I used my self-assessment to confirm/compare their findings and responses.

Time was an issue for the research participants as participating in my study was time-consuming for them. During the last quarter of the year lecturers were busy with planning, examinations, assessment, marking and reporting, and at the same time had to observe and give feedback on their observations. Learners were reluctant to complete a questionnaire that was not going to give them extra marks; nevertheless they participated. Consequently their responses might not be a true reflection of what was happening.

The use of the HBDI was appropriate and enabled me to get more information about my learning style and learners' learning styles; feedback on questionnaires provided information about my facilitating of learning. Therefore the spiral development of data strengthened the validity and reliability of my findings. Zuber-Skerritt's emancipatory action research model and Du Toit's (2009) asset-based model helped me to identify areas of development to improve myself and my practice continuously (Zuber-Skerritt, 1992).

In addition I was able to move beyond perceptions of learners' feedback, and feedback by peers to gather data on my learning style flexibility and identify my learning style (Cohen, Manion & Morrison, 2007). However, if I had to conduct the study again I would involve the college management team so that I could gather in-depth data on members' perceptions of the role of promoting learning style flexibility in teaching and learning.

In the next section I discuss my recommendations for addressing learning style flexibility. This is done by reflecting on learners' feedback, the HBDI and observations.

4 Reflection on the Herrmann Brain Dominance Instrument (HBDI)

The HBDI provided me with the results of my learning style profile, which indicate that my dominant thinking style is in the B quadrant. There are four groups of profile – single dominant profile, double dominant profile, triple dominant profile and quadruple dominant profile. My profile is double dominant (2112). I accept the results as I like to organise, work in sequence, plan my work and get detailed information. I prefer information that is interpersonal, feeling-based and involves emotions. I do not enjoy working with experimental or theoretical activities. In relation to the results of the HBDI I have to move from my comfort zone and try to accommodate other learning styles so that I am able to accommodate learners' learning styles. Then I have to learn to design learning activities in a way that they accommodate and utilise the cognitive functions of the learners in all four quadrants of Herrmann's whole brain model. This will help me and the learners to be flexible.

I have learned that the HBDI is a tool that can be used to understand one's strengths and blind spots, preferences and avoidances. There is no such thing as a good or bad preference but there are only preferences that are more or less suited to one's situation, profession and activities. The most desirable profile is the profile that truly matches one's goals in life and the professional activities one is pursuing. Learners share profiles but have different preferences.

5 Reflection on Learner and Peer Feedback

Learner responses compared to the two lecturers' responses indicate that there is a need for improvement on how I provide learning opportunities that are lively and encouraging. I have to improve in this regard.

Comparing my self-assessment to lecturers' responses suggests that I develop how I create a climate conducive to deep learning and how I link learning to real-life situations.

The feedback from the learners is not aligned with my peers' observations. The learners' responses suggest that there is a need for improvement while lecturers' responses suggest that there is no need for urgent improvement. I will respond to learners' indicators by improving how I maintain learning and promoting facilitator-student discussions to allow learners to develop an enquiring mind.

6 Reflection on Peer Observations

The learners' comments on how I use group work indicate that I do not like to use groups but I prefer to pay individual attention to learners. Lecturers reported that I do use groups but do not do so effectively because I make learners work in pairs. If I reflect on how I use groups I can see that my learning activities do not encourage group work but I focus on supporting learners individually. I should work on my usage of groups to achieve the desired learning outcomes.

Both learners' and my peers' comments indicate that I assess learners continuously during and after the learning activity to monitor their understanding. Learners are comfortable with my assessment style as it gives them the opportunity to do self-assessment. I can use assessment to make changes in how I facilitate learning to the class.

Comments by my peers indicate that my relationship with learners is good. Learners are open to me and free to ask questions during the learning activity. I give learners individual attention which makes learners feel accommodated and wanted. Learners' comments indicate that I motivate and discipline them constantly. I encourage them to be responsible for their learning. I have to motivate learners to understand their learning style and use this knowledge for their learning and understanding of content.

Herrmann's whole brain model will be used in future to ensure that learners preferred thinking modes are utilised to ensure that there is learning style flexibility. The way in which I ask

questions during a learning activity has to improve to allow learners to express themselves freely.

7 Recommendations for Further Research

The research findings indicate that there is much to be learned about learning style flexibility. However, more research on learning style flexibility in South African education, especially in the FET college context, is recommended. The following are suggestions for further research:

- More research should be conducted on finding out how educators can be motivated to determine and understand their learning styles and accommodate learners' learning styles in their facilitating of learning.

- It would be valuable to investigate how office-based educators (subject advisors) support college-based educators to plan learning opportunities in a way that accommodates learners' learning styles.

- Investigation of how curricula accommodate learning style flexibility.

- It would be valuable to examine how educators understand their role in education as agents of change in relation to accommodating the learning styles of learners.

- It would be significant to study the relationship between whole brain learning and multiple intelligences and the application of the principles in my practice.

- How learning style flexibility can be used to support educators practicing multi-grading and multi-level teaching.

8 Conclusion

This chapter provides the summary of the findings on learning style flexibility. Feedback from learners indicates that educators need to change their approach to planning learning activities for learners. For educators to change they have to understand their learning styles first before they can accommodate and understand learners' learning styles.

My self-assessment highlighted areas that I have to improve so that I am able to accommodate learners' learning styles in my facilitating of learning. I learnt that effective teaching and learning demand of me to search for and have knowledge of the content that accommodates learners' multiple intelligences. I must work hard to be the lifelong learner who continuously expands professional knowledge and develops skills.

A number of factors promote effective learning support and learning style flexibility. These factors encourage the following:

- Commitment and active participation by the learners

- Lifelong willingness to learn; development of the full potential of each learner

- Learners giving meaning to their daily existence, enabling them to exercise command over themselves and their will.

The next chapter focuses on the reflection on my professional development since I started my studies on Educator Professional Development.

CHAPTER 6
META-REFLECTION

1 Introduction

This chapter focuses on meta-reflections on the entire process of my study and how it contributed to my personal development and my practice. The focus is on the content I have mastered and how it helped me to improve professionally as an educator and my self-regulating of my professional learning process.

2 Reflection on Compulsory Modules

There are two compulsory modules that all MEd students have to pass before they can qualify to do research. Those modules are Research Methodology and Education Development and Globalisation.

Research methodology focuses mainly on different research methodologies. I learned about the difference between qualitative and quantitative methods, how to write a research proposal and to conduct research. Qualitative research is normally associated with general descriptive inquiry that draws on interviews, documents, narratives and observations to research a problem. Quantitative research is associated with statistical and experimental studies that rely on various kinds of numerical manipulation to research a problem. My understanding of the difference between qualitative and quantitative research methods helped me to choose the correct research method for my study.

For my study I used action research because it is a systematic procedure followed by educators like me to gather information about, and subsequently improve the ways in which my particular educational setting operates. Action research is a flexible spiral process that allowed me to take action (change, improvement) and to research (understanding and knowledge) at the same time. Understanding allowed more informed change in my practice and at the same

time my understanding was informed by change. People like me affected by change are usually involved in action research. For me action research was therefore an organised form of professional learning, including cycles of planning, acting, observing and reflecting. Action research was appropriate for my research as it addressed specific, practical issues and seeked to obtain solutions; it involved both action and research. The strength of my action research is that it produced change and improvement in my practice.

It also set out to change me in the direction of greater emancipation as the one participating in and controlling the research. It brought about change in my definitions of my professional skills and roles, increased my awareness of classroom issues, improved my disposition towards reflection and changed my values and beliefs; it improved the cognisance between practical theories and practices and broadened my view of teaching, schooling and society (Noffke & Zeichner as cited in Cohen, Manion & Morrison, 2007).

The module on research methodology helped me understand research terminology and how to develop the statement of the problem for the research as well as how to write a proposal that can be researched. Professionally I developed in relation to what research is and in implementing procedures of conducting research. Knowledge gained from the research methodologies module is used for the improvement of my practice and personal growth.

The module on Education, Development and Globalisation focuses on global education as compared to the South African education system. Different topics on what theory is and an introduction to education theory have been covered in the contact sessions.

The theory on feminism, its origins and types was interesting. Liberal feminism stands for the liberation or freedom of women to choose their lives, to be able to compete with men on equal terms in professional and political worlds and in the labour market. Radical feminism seeks to uncover the root cause of all forms of oppression and domination. Oppression of women is its central concern. Although feminism was not included in my study, I am convinced that the emancipatory nature of action research is a process that can promote feminism. The work by Speedy (2003) and participating contributors substantiates my viewpoint. The book is about a group of South African women who used action learning and action research.

Feminism helped me to understand and accommodate learners in my class without discriminating on a basis of gender. The compulsory modules prepared me for the entire course as I knew what was expected of me as a MEd student. Knowledge gained from compulsory modules helped me to understand basic issues and concepts about post graduate studies and how to search for and read articles with understanding. I learned how to access library resources electronically and improved my technological expertise.

3 Reflection on Course Work

The modules for Educator Professional Development are Assessment and Quality Assurance, Facilitating Learning, Facilitating Change in Education and Professional Development.

The highlight of my studies was when Dr PH du Toit introduced the topic on learning style flexibility. That was when I discovered that I have to change my approach to facilitating learning and improve professionally. I learnt about Herrmann's Whole Brain model in which Herrmann (1996) points out that each quadrant is specialised.

By understanding how the four quadrants work I can accommodate learners that learn in different ways. For effective learning to take place during learning activities I plan should accommodate all four quadrants of the brain. Furthermore, if I facilitate learning in a manner that accommodates my learners' less preferred learning style modes, their discomfort level may be great enough to interact with their learning. Hence it is expected of me as an educator to facilitate learning in a manner that makes learners feel comfortable and able to reach their full potential. I have learnt that as an educator I have to integrate both less preferred and preferred learning modes. For me to make learning possible for learners, learning content has to be structured and learning activities designed and delivered in such a way that they accommodate diverse learner thinking and learning styles. Using whole brain teaching in my practice bridges the gap between unique individual learners and the design and delivery of the learning.

Kolb's learning style model helped me to understand that learners learn in different ways and have their own preferred styles of learning. I also gained a lot by comparing different learning style theories and was surprised how related they are.

I used a simplified learning style questionnaire to identify learners' learning style and the Herrmann Brain Dominance Instrument to identify my learning style. Therefore I argue that if educators know their learning styles, they are able to facilitate learning effectively by accommodating learners' learning styles and will ensure that their potential an their learners' potential are maximised. In this regard the following quote by Leonard and Murphy (1995) is apt:

> We need to continuously seek and create opportunities to stretch ourselves way beyond what we may think our capacity is: continuously turning our bodies, expanding our senses, deepening our relationships, and serving others ─ and fully utilize human potential.

Through models of instructional design I learned that effective teaching requires a great deal of time; learning activities should be planned in a manner that ensures mastery of learning outcomes and the development of learners' full potential. Models of instructional design helped me to develop interactive partnerships with learners, characterised by open communication to achieve optimal teaching and learning results. I have come to recognise the importance of planning and discussing outcomes of learning activities with learners and of learners with different learning styles knowing what is expected of them.

I learnt that the following are different characteristics that can influence an individual learner's ability to learn are the following:

- Motivation of learners by creating an environment and atmosphere within which learners can fulfil their learning needs in the most disciplined way.

- Making learners responsible for the success of their own studies and investing individual or collaborative effort in their learning.

- Learners' different intellectual abilities and capacities for concentration and perseverance should be taken into consideration for the promotion of effective learning.

- Learning skills of learners and the rate of learning usually determine their learning success.

These characteristics have helped me to plan thoroughly and to decide how to promote learning by identifying instructional practices that are effective with individual learners. I have learned that implementing learning activities and content that match learners' level of understanding encourages learners to be active participants in learning.

I realise that every learner is created with unique, unlimited potential. Educators as facilitators of learning like me should create opportunities that help learners to rediscover and develop their full potential. Educators should accommodate multiple intelligences in their learning opportunities.

Understanding co-operative learning helped me to move from a teacher-centred approach to a learner-centred one. Co-operative learning occurs when small groups of learners work together to maximise learning. It increases positive relationships among learners of different ethnic groups and learning styles. Co-operative learning has essential characteristics which are the following:

- Positive interdependence (each learner's success is tied to the success of the group)
- Face-to-face interaction (learners' interaction promotes one another's success)
- Individual and group accountability
- Interpersonal and small group skills
- Group processing.

Through co-operative learning I can accommodate learners' learning styles and create opportunities for learners to learn on their own. I have developed a better understanding of the

seven roles of educators and how I can apply them in my practice to support or accommodate learners and develop myself professionally.

The seven roles of educators helped me to approach my studies holistically in order to master the necessary knowledge and skills to monitor my professional development as facilitator of learning. Understanding the roles of educators encouraged me to maintain a positive attitude to learning and to my practice.

4 Reflection on Facilitating Change in Education

The purpose of this module is to enable Education, Training and Development Practitioners to facilitate sustained deep and fundamental educational change effectively. I have gained knowledge on what the purpose of life is and how that purpose can be educational. Slabbert (2006) defines the purpose of life as to maximise and fully utilise human potential and this purpose of life should be guided by a norm for it to be educational which became part of my educational values. If the purpose of life is educational it has to maximise and fully utilise human potential towards a safe, sustainable and prosperous universe for all. What I learnt from Leonard and Murphy (1995) is that "Our destiny is to learn and keep on learning for as long as we live." Therefore my professional learning is a lifelong process. This shows that there is a need for change in education as the problem cannot be solved with the same consciousness that created it. In order to allow my learners to become lifelong learners I have to take action towards changing the way in which learners learn and in which I facilitate learning.

I agree with Slabbert (2006) that the kind of learning that I require in my practice is the construction of meaning by the learner him-/herself, who is then able to do something creatively new. I can achieve this through experience and facilitating learning by continuously improving my professionalism. This is why I am expected to be a facilitator of learning to ensure that there is change in my practice. The aim of my practice is to educate learners to fully utilise their human potential towards a safe, sustainable and prosperous universe for all through facilitating lifelong learning.

The type of educator I should become is one that can support learners to achieve the aim of education. With a view to achieving this I should become a facilitator of insight, change and growth, who teaches that answers come from within. I should involve learners in their learning and no one (I or peers) should do it for them. My role as facilitator should be to get the learners to start learning and to ensure that the learners keep on learning until the highest possible quality of learning has been achieved.

From this module I have learned that as an educator I must be an agent of change in my practice and facilitate change in education. I have noticed that educators do not change their old practices or approaches, even if the curriculum changes. As an educator I have to develop myself continuously professionally so that I can be an agent of change in my practice. Understanding learners and working together with all stakeholders can benefit my practice as a whole. As leader I should also take responsibility for mentoring my peers.

5 Reflection on Research Process

I did not know how to start writing a research proposal of ten pages and I was not sure what structure to use. The support I received from my supervisor was very important. The structure of the proposal was outlined to me and I started writing it, enjoying the support of my supervisor. I learned how to write academically and search for information relevant to my studies.

The most interesting part of my research was when I had to defend my proposal to a panel of experts. That was when I discovered that I had developed professionally and could still improve to be the best in my profession.

I enjoyed conducting research and I had an opportunity to learn new things from my colleagues and learners about myself. Responses and comments by both learners and lecturers about my facilitating of learning indicated to me that other people have different perceptions about me. I learnt that what I know about myself is the tip of the iceberg.

My research has helped me to identify areas that need to be developed in my profession and how I can improve my potential as educational practitioner and independent, lifelong learner. I have learnt that there is no point that one can reach and say, “I am fully developed”.

6 Conclusion

My studies have contributed to my professional development and the way in which I perceive myself and my profession. I have learnt that as an educator I have to develop myself continuously so that I am able to face the challenges of my teaching profession. My knowledge should benefit others. There is much to be learnt about my profession and I have to contribute positively towards the improvement of it and the professional development of my colleagues.

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Appendix A: Ethical Clearance Certificate

UNIVERSITY OF PRETORIA

FACULTY OF EDUCATION

RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	**CLEARANCE NUMBER :** EM 10/08/05
DEGREE AND PROJECT	MEd Dynamics of learning style flexibility in teaching and learning.
INVESTIGATOR(S)	Boesman Petrus Ngozo
DEPARTMENT	Education Management and Policy Studies
DATE CONSIDERED	30 September 2011
DECISION OF THE COMMITTEE	APPROVED

Please note:

For Masters applications, ethical clearance is valid for 2 years
For PhD applications, ethical clearnace is valid for 3 years.

CHAIRPERSON OF ETHICS COMMITTEE Prof L Ebersohn

DATE 30 September 2011

CC Jeannie Beukes
Dr P. Du Toit

This ethical clearance certificate is issued subject to the following conditions:

1. A signed personal declaration of responsibility
2. If the research question changes significantly so as to alter the nature of the study, a new application for ethical clearance must be submitted
3. It remains the students' responsibility to ensure that all the necessary forms for informed consent are kept for future queries.

Please quote the clearance number in all enquiries.

Appendix B: HBDI

HBDI

Herrmann Brain Dominance Instrument
Thinking Styles Assessment

This 120-question survey form results in a profile of your preferred thinking styles. By understanding your thinking style preferences you can achieve greater appreciation how you learn, make decisions, solve problems, and communicate, and why you do these things—and others—the way you do. The survey measures preferences rather than skills. It is not a test; there are no wrong answers. You will gain the greatest understanding by answering the questions frankly and sincerely

Herrmann International
Your HBDI Practitioner: Dr Pieter H du Toit
Fax completed form to: (012) 4203003
International telephone number: +27 12 4202817
E-mail: pieter.dutoit@up.ac.za

INSTRUCTIONS

A profile of your mental preferences will be determined by your responses to the following 120 questions. Answer each question by writing in the appropriate words or numbers, or marking the boxes provided. This is not a test, and there are no right or wrong answers. You are only indicating your preferences. Please respond to questions as authentically as possible, keeping in mind your total self, at work and at home. When you have completed the survey form, confirm that you have answered every question. Then complete the name and address information on the back of the form, and send or fax pages 2 to 5 to Herrmann International Africa at the address on the cover.

Refer to the glossary of terms for clarification of the terms used. Save the glossary page for reference when you receive your profile results.

GLOSSARY OF TERMS

Analytic: Breaking up things or ideas into parts and examining them to see how they fit together.

Artistic: Taking enjoyment from or skillful in painting, drawing,

Intuitive: Knowing something without thinking it out – having instant understanding without need for facts or proof.

Logical: Able to reason deductively from what has gone

music, or sculpture. Able to coordinate color, design, and texture for pleasing effects.

Conceptual: Able to conceive thoughts and ideas, to generalize abstract ideas from specific instances.

Controlled: Restrained, holding back, in charge of one's emotions.

Conservative: Tending towards maintaining traditional and proven views, conditions, and institutions.

Creative: Having unusual ideas and innovative thoughts. Able to put things together in new and imaginative ways.

Critical: Exercising or involving careful judgement or evaluation, e.g., judging the feasibility of an idea or product.

Detailed: Paying attention to the small items or parts of an idea or project.

Dominant: Ruling or controlling; having strong impact on others.

Emotional: having feelings that are easily stirred, displaying those feelings.

Empathetic: Able to understand how another person feels, and able to communicate that feeling.

Extrovert: More interested in people and things outside of self than internal thoughts and feelings. Quickly and easily exposes thoughts, reactions, feelings, etc. to others.

Financial: Competent in monitoring and handling of quantitative issues related to costs, budgets, and investments.

Holistic: Able to perceive and understand the "big picture" without dwelling on individual elements of an idea, concepts, or situation. Can see the forest as contrasted with the trees.

Imaginative: Able to form mental images of things not immediately available to the senses or never wholly perceived in reality, able to confront and deal with a problem in a new way.

Implementation: Able to carry out an activity and ensure fulfillment by concrete measures and results.

Innovating: Able to introduce new or novel ideas, methods, or devices.

Integration: The ability to combine pieces, parts and elements of ideas, concepts and situations into a unified whole.

Intellectual: Having superior reasoning powers, able to acquire and retain knowledge.

Interpersonal: Easily able to develop and maintain meaningful and pleasant relationships with many different kinds of people.

Introvert: Directed more towards inward reflection and understanding than towards people and things outside of self. Slow to expose reactions, feelings, and thoughts to others.

before.

Mathematical: Perceiving and understanding numbers and being able to manipulate them to a desired end.

Metaphorical: Able to understand and make use of visual and verbal figures of speech to suggest a likeness or an analogy in place of literal descriptions, e.g., "heart of gold."

Musical: Having an interest in or talent for music and/or dance.

Organized: Able to arrange people, concepts, objects, elements, etc. into coherent relationships with each other.

Planning: Formulating methods or means to achieve a desired end in advance of taking actions to implement.

Problem solving: Able to find solutions to difficult problems by reasoning.

Quantitative: Oriented toward numerical relationships; inclined to know or seek exact measures.

Rational: Making choices on the basis of reason as opposed to emotion.

Reader: One who reads often and enjoys it.

Rigorous thinking: Having a thorough, detailed approach to problem- solving.

Sequential: Dealing with things and ideas one after another or in order.

Simultaneous: Able to process more than one type of mental input at a time, e.g. visual, verbal, and musical; able to attend to more than one activity at a time.

Spatial: Able to perceive, understand and manipulate the relative positions of objects in space.

Spiritual: Having to do with spirit or soul as apart from the body or material things.

Symbolic: Able to use and understand objects, marks, and signs as representative of facts and ideas.

Synthesizer: One who unites separate ideas, elements, or concepts into something new.

Technical: Able to understand and apply engineering and scientific knowledge.

Teaching/ training: Able to explain ideas and procedures in a way that people can understand and apply them.

Verbal: Having good speaking skills, clear and effective with words.

Writer: One who communicates clearly with the written word and enjoys it.

BIOGRAPHICAL INFORMATION

Please complete **every** question according to the directions given. Each response, including your answers to questions 1, 2, 3 and 4, provide important data. When directions are not followed or data is incomplete we are unable to process your survey, and must return it to you.

1. Name _____ **2. Gender** **M** ☐ **F** ☐

3. Educational focus or specialist subject(s) _____

4. Occupation or job title _____

Describe your work (please be as specific as possible) _____

HANDEDNESS

5. Which picture most closely resembles the way you hold a pencil? Mark box A, B, C or D.

A ☐  **B** ☐  **C** ☐  **D** ☐ 

6. What is the strength and direction of your handedness? Mark box A, B, C, D or E.

A ☐ Primary left **B** ☐ Primary left Some right **C** ☐ Both hands equal **D** ☐ Primary right, some left **E** ☐ Primary right

SCHOOL SUBJECTS

Think back to your performance in the elementary and/or secondary school subjects identified below. Rank order all three subjects on the basis of how well you did: **1 = best; 2 = second best; 3 = third best.**

7 ☐ **Mathematics** **8** ☐ **Foreign language** **9** ☐ **Native language or mother tongue**

Please check that no number is duplicated**: The numbers** 1**,** 2**, and** 3 must be used once **and** only once**. Correct if necessary**

WORK ELEMENTS

Rate each of the work elements below according to your strength in that activity, using the following scale**: 5 = work I do best; 4 = work I do well; 3 = neutral; 2 = work I do less well; 1 = work I do least well**.
Enter the appropriate number next to each element. Do not use any number more than four times.

10 ☐	Analytical	**16** ☐	Technical Aspects	**21** ☐	Innovating
11 ☐	Administrative	**17** ☐	Implementation	**22** ☐	Teaching/Training
12 ☐	Conceptualising	**18** ☐	Planning	**23** ☐	Organisation
13 ☐	Expressing Ideas	**19** ☐	Interpersonal Aspects	**24** ☐	Creative Aspects
14 ☐	Integration	**20** ☐	Problem Solving	**25** ☐	Financial Aspects
15 ☐	Writing				

Please tally: Number of: 5's ☐ 4's ☐ 3's ☐ 2's ☐ 1's ☐

If there are more than four **for any category, please redistribute.**

KEY DESCRIPTORS

Select eight adjectives, which best describe the way you see yourself. Enter a **2** next to each of your eight selections. Then change one **2** to a **3** for the adjective which best describes you.

26 ☐	Logical	**35** ☐	Emotional	**43** ☐	Symbolic
27 ☐	Creative	**36** ☐	Spatial	**44** ☐	Dominant
28 ☐	Musical	**37** ☐	Critical	**45** ☐	Holistic

29	☐	Sequential	**38**	☐	Artistic	**46**	☐	Intuitive
30	☐	Synthesizer	**39**	☐	Spiritual	**47**	☐	Quantitative
31	☐	Verbal	**40**	☐	Rational	**48**	☐	Reader
32	☐	Conservative	**41**	☐	Controlled	**49**	☐	Simultaneous
33	☐	Analytical	**42**	☐	Mathematical	**50**	☐	Factual
34	☐	Detailed						

Please count: seven 2's and one 3? **Correct if necessary.**

HOBBIES

Indicate a maximum of six hobbies you are actively engaged in. **Enter a 3** next to your major hobby, a **2 next** to each primary hobby, and a **1 next** to each secondary hobby. **Enter only one 3**.

51	☐	Arts/Crafts	59	☐	Gardening/Plants	67	☐	Sewing
52	☐	Boating	60	☐	Golf	68	☐	Spectator Sports
53	☐	Camping/Hiking	61	☐	Home Improvements	69	☐	Swimming/Diving
54	☐	Cards	62	☐	Music Listening	70	☐	Tennis
55	☐	Collecting	63	☐	Music Playing	71	☐	Travel
56	☐	Cooking	64	☐	Photography	72	☐	Woodworking
57	☐	Creative Writing	65	☐	Reading	Other	☐	
58	☐	Fishing	66	☐	Sailing	Other	☐	

Please review**: Only one** 3 **and** no more than six hobbies**. Correct if necessary.**

ENERGY LEVEL

73. Thinking about your energy level or "drive," select the one that best represents you. Mark box A**,** B**, or** C**.**

A ☐ **Day person** **B** ☐ **Day/night person equally** **C** ☐ **Night person**

MOTION SICKNESS

74. Have you ever experienced motion sickness (nausea, vomiting) in response to vehicular motion (while in a car, boat, plane, bus, train, amusement ride)? Check boxes A, B, C, or D to indicate the number of times.

A ☐ **None** **B** ☐ **1-2** **C** ☐ **3-10** **D** ☐ **More than 10**

75. Can you read while traveling in a car without stomach awareness, nausea, or vomiting?

A ☐ **Yes** **B** ☐ **No**

ADJECTIVE PAIRS

For each paired item **below, check the word or phrase, which is more descriptive of you. Mark box** A **or** B **for** each **pair, even if the choice is a difficult one.** Do not omit any pairs**.**

76	Conservative	☐	☐	Empathetic	88	Imaginative	☐	☐	Sequential
77	Analyst	☐	☐	Synthesizer	89	Original	☐	☐	Reliable
78	Quantitative	☐	☐	Musical	90	Creative	☐	☐	Logical
79	Problem-solver	☐	☐	Planner	91	Controlled	☐	☐	Emotional
80	Controlled	☐	☐	Creative	92	Musical	☐	☐	Detailed
81	Original	☐	☐	Emotional	93	Simultaneous	☐	☐	Empathetic
82	Feeling	☐	☐	Thinking	94	Communicator	☐	☐	Conceptualise
83	Interpersonal	☐	☐	Organiser	95	Technical things	☐	☐	People-oriented
84	Spiritual	☐	☐	Creative	96	Well-organised	☐	☐	Logical
85	Detailed	☐	☐	Holistic	97	Rigorous Thinking	☐	☐	Metaphorical Thinking
86	Originate Ideas	☐	☐	Test and Prove Ideas	98	Like Things Planned	☐	☐	Like Things Mathematical
87	Warm, Friendly	☐	☐	Analytical	99	Technical	☐	☐	Dominant

Please review**: Did you mark one and only one of each pair? Correct if necessary.**

INTROVERSION / EXTROVERTION

100. Mark one box to place yourself on this scale from introvert to extrovert:

Introvert								Extrovert

TWENTY QUESTIONS

Respond to each statement by marking the box in the appropriate column		Strongly agree ▼	Agree ▼	In between ▼	Disagree ▼	Strongly disagree ▼
101	I feel that a step-by-step method is best for solving problems.					
102	Daydreaming has provided the impetus for the solution of many of my more important problems.					
103	I like people who are most sure of their conclusions.					
104	I would rather be known as a reliable than an imaginative person.					
105	I often get my best ideas when doing nothing in particular.					
106	I rely on hunches and the feeling of “rightness” or “wrongness” when moving toward the solution to a problem					
107	I sometimes get a kick out of breaking the rules and doing things I’m not supposed to do.					
108	Much of what is most important in life cannot be expressed in words.					
109	I’m basically more competitive with others than self competitive					
110	I would enjoy spending an entire day “alone with my thoughts.”					
111	I dislike things being uncertain and unpredictable.					
112	I prefer to work with others in a team effort rather than solo.					
113	It is important for me to have a place for everything and everything in its place.					
114	Unusual ideas and daring concepts interest and intrigue me.					
115	I prefer specific instructions to those which leave many details optional					
116	Know-why is more important than know-how.					
117	Thorough planning and organisation of time are mandatory for solving difficult problems.					
118	I can frequently anticipate the solutions to my problems.					
119	I tend to rely more on my first impressions and feelings when making judgments than on a careful analysis of the situation.					
120	I feel that laws should be strictly enforced.					

Please review to make sure you have answered all 120 questions.

FORM

You must provide an address and indicate the method of payment in order to receive your HBDI results. Please print.

Name _____ **Date** _____

Company _____

Division _____

Company address _____

Daytime phone _____ **Evening phone** _____ **Fax** _____

Home address _____

_____

E-mail address _____

Note: There is a fee for processing this survey form. Please consult your HBDI practitioner.

R700 to be paid into cost centre AG 327/03545 of the University of Pretoria

CONFIDENTIAL RESEARCH

The following questions are not used in scoring the HBDI. However, the answers to these questions are valuable in our continuing brain dominance research. Skip any questions you wish, but please answer as many as you feel you can.

Indicate the birth order of your brothers, sisters, and self by marking the appropriate symbols. Then circle the symbol representing you.

	Oldest	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
MALE ♂ Brothers													♂ MALE
SELF													
FEMALE ♀ Sisters													♀ FEMALE

Ethnicity: Black ☐ White ☐ Asian ☐ Other _____

If you are a parent, please indicate: number of children ☐ Age of oldest ☐ Age of youngest ☐

Couple status Married ☐ Separated ☐ Divorced ☐ Living together ☐ Widow/widower ☐ Single ☐

To what extent were you formally educated for the field you are now working in?

☐ Not at all ☐ Somewhat ☐ To a great degree ☐ Fully

Have you filled out the HBDI survey previously? If so, and your name or address has changed since then, please specify the previous name or address

How do you see yourself? Please distribute 100 points between these four descriptions:

Rational ☐ Organised ☐ Interpersonal ☐ Imaginative ☐

Please check the best descriptor indicating your mood or the way you felt at the time you were completing this survey:

☐ Happy	☐ Enthusiastic	☐ Interested	☐ OK	☐ Relaxed	☐ Indifferent
☐ Distracted	☐ Tired	☐ Unhappy	☐		

Appendix C: Whole Brain Learning Style Questionnaire for Learners

APPENDIX C

Learning Style Survey: Whole Brain Learning

Instructions

1 Think about a programme/module you are enrolled for.

2 Answer all the following questions. *Note:* Your first reaction to a statement is usually the best response.

3 For each of the statements, encircle the best fitting answer:

SD = strongly disagree (1)
D = disagree (2)
N = neutral (3)
A = agree (4)
SA = strongly agree (5)

Quadrant A	SD	D	N	A	SA
1 I learn a lot when the lecturer gives an informative lecture	1	2	3	4	5
2 I enjoy collecting and analyzing facts, ideas, and theories	1	2	3	4	5
3 I like it when the lecturer is in charge and clearly explains subject matter	1	2	3	4	5
4 I like brief, clear and to-the-point information that is accurate and tied to expert sources	1	2	3	4	5
5 I enjoy critical analysis and problem solving	1	2	3	4	5
6 I don't like a lot of open-ended sharing of feelings and opinions	1	2	3	4	5

Quadrant B	SD	D	N	A	SA
1 I like content organized into lists, outlines, and categories	1	2	3	4	5
2 I need frequent opportunities for guided practice, feedback, and review during class	1	2	3	4	5
3 I want instruction to be well-planned, practical, structured, and sequential	1	2	3	4	5
4 I need checkpoints and activities to verify my understanding of material	1	2	3	4	5
5 I want the lecturer to give clear instructions, to keep the classroom orderly, and start and stop on time	1	2	3	4	5
6 I am frustrated by a lot of open-ended activities, discussion, and exploration of ideas	1	2	3	4	5

Quadrant C	SD	D	N	A	SA
1 I enjoy hands-on, active instruction where I get to move around	1	2	3	4	5
2 I enjoy discussion in class so that I can share my ideas and hear what others are thinking	1	2	3	4	5
3 I appreciate hearing personal stories from the lecturer that connect to the topic I am learning about	1	2	3	4	5
4 I like to receive personal attention, care, and acceptance from the lecturer with smiles and good eye-contact	1	2	3	4	5
5 I like to get to know other students and discuss ideas with them	1	2	3	4	5
6 I dislike competition in the classroom and need to feel comfortable with everyone in order to learn	1	2	3	4	5

Quadrant D	SD	D	N	A	SA
1 It is important for me to see the big picture whenever we start a new unit of instruction	1	2	3	4	5
2 I like to have the lecturer use visuals that show patterns, connections, and relationships	1	2	3	4	5
3 I like the freedom in class to explore ideas, make discoveries, and figure things out on my own	1	2	3	4	5
4 I enjoy variety and change in the classroom	1	2	3	4	5
5 It is important for me to choose how to do things and to have several options available	1	2	3	4	5
6 I'm frustrated with a structured lecture with lots of lists and outlines	1	2	3	4	5

Scoring your profile

- Add up your total scores from each quadrant
- Enter the totals in the chart below
- Encircle your top scores
- If there are any scores within two or three points of your top score, encircle them also
- The encircled quadrants are likely to represent your preferred way(s) of learning

Quadrant	**A**	**B**	**C**	**D**
Total scores				

Appendix D: Learner Feedback Questionnaire

APPENDIX D

~~Learner~~ Feedback Questionnaire

Effective learning is considered a collaborative effort between you as learner, your peers and your lecturer. The design of this questionnaire is based on the principles of learning-centredness. Your thoughtful answers to the following items will provide helpful information to your lecturer that can help to enhance your learning experience, and that of future students.

Section A: Biographical Information

Name:
Gender:
Age :
Race Group:
Occupation:
Highest Grade:

Section B: Facilitator's Contribution

Describe your facilitator's contribution to your learning in terms of each of the aspects addressed in the items below, using the following scale: 1 hardly ever 2 occasionally 3 frequently 4 almost always					
Category I The facilitator inspires me by:	**NA**	**1**	**2**	**3**	**4**
a showing enthusiasm about the subject matter and learning activities					
b expressing her-/himself well (variety in tone of voice)					
c promoting insight in the importance and significance of the subject matter and related problems/ innovations					
d providing learning opportunities (classes) that are lively and encouraging					
Category II The facilitator initiates learning by:					
a creating a climate conducive to deep learning					
b clearly stating the purpose and learning outcomes of the session					
c linking learning to real life situations					
Category III The facilitator maintains learning by:					
a promoting facilitator-student discussions/academic discourse to allow me to develop an enquiring mind					
b encouraging me to construct my own understanding and material (constructivism)					

c	providing for learning style flexibility (other ways of learning, not only according to my own preference)					
d	encouraging me to express myself freely and openly					
e	inculcating critical thinking and self reflection					

General Comments

Section C: Students's Contribution

Describe your own contribution to your learning in terms of each of the aspects addressed in the items below, using the following scale:
1 hardly ever 2 occasionally 3 frequently 4 almost always

		NA	1	2	3	4
Category I As a learner I contribute to my own and others' learning by:						
a	showing enthusiasm about the subject matter and learning activities					
b	expressing myself well (variety in tone of voice and with confidence)					
c	gaining insight in the importance and significance of the subject matter and related problems/ innovations					
d	participating in such a way that the learning opportunity (class session) become lively and encouraging					
Category II As a learner I:						
a	co-create a climate conducive to deep learning					
b	continuously attempt linking my learning to real life situations					
c	attempt to construct a big picture of the multidimensional nature of the session					
Category III As a learner I:						
a	take part in facilitator-student discussions/academic discourse to allow me to develop an enquiring mind					
b	construct my own understanding and material (constructivism)					
c	seek opportunities for developing learning style flexibility (learning in different ways, not only according to my own preference)					
d	make use of opportunities to express myself freely and openly					
e	reconsider many of my former attitudes and values					
f	gained a better understanding of myself					
g	developed a greater sense of my own responsibility					
h	contribute to my peers' learning (helping them find solutions/answers)					
i	seek to inculcate critical thinking and self-reflection					

General Comments

Appendix E: Peer Feedback Questionnaire

APPENDIX E

Peer Feedback Questionnaire

Effective learning is considered a collaborative effort between learner and their lecturer. The design of this questionnaire is based on the principles of learning-centredness. Your thoughtful answers to the following items will provide helpful information to the lecturer that can help to enhance his/her teaching experience.

Section A: Biographical Information

Name:
Gender:
Age :
Race Group:
Occupation:
Highest Grade:

Section B: Facilitator's Contribution

Describe facilitator's contribution to learners learning in terms of each of the aspects addressed in the items below, using the following scale: 1 hardly ever 2 occasionally 3 frequently 4 almost always					
Category I The facilitator inspires learners by:	**NA**	**1**	**2**	**3**	**4**
a showing enthusiasm about the subject matter and learning activities					
b expressing her-/himself well (variety in tone of voice)					
c promoting insight in the importance and significance of the subject matter and related problems/ innovations					
d providing learning opportunities (classes) that are lively and encouraging					
Category II The facilitator initiates learning by:					
a creating a climate conducive to deep learning					
b clearly stating the purpose and learning outcomes of the session					
c linking learning to real life situations					

Category III The facilitator maintains learning by:					
a promoting facilitator-student discussions/academic discourse to allow me to develop an enquiring mind					
b encouraging me to construct my own understanding and material (constructivism)					
c providing for learning style flexibility (other ways of learning, not only according to my own preference)					
d encouraging me to express myself freely and openly					
e inculcating critical thinking and self reflection					

General Comments

Section C: Learner's Contribution

Describe learners contribution to learning in terms of each of the aspects addressed in the items below, using the following scale:
1 hardly ever 2 occasionally 3 frequently 4 almost always

	NA	**1**	**2**	**3**	**4**
Category I Learners contribute to their own and others' learning by:					
a showing enthusiasm about the subject matter and learning activities					
b expressing myself well (variety in tone of voice and with confidence)					
c gaining insight in the importance and significance of the subject matter and related problems/ innovations					
d participating in such a way that the learning opportunity (class session) become lively and encouraging					
Category II Learners :					
a co-create a climate conducive to deep learning					
b continuously attempt linking my learning to real life situations					
c attempt to construct a big picture of the multidimensional nature of the session					
Category III Learners :					

a take part in facilitator-student discussions/academic discourse to allow me to develop an enquiring mind					
b construct my own understanding and material (constructivism)					
c seek opportunities for developing learning style flexibility (learning in different ways, not only according to my own preference)					
d make use of opportunities to express myself freely and openly					
e reconsider many of my former attitudes and values					
f gained a better understanding of myself					
g developed a greater sense of my own responsibility					
h contribute to my peers' learning (helping them find solutions/answers)					
i seek to inculcate critical thinking and self-reflection					

General Comments