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The association between learning styles and self-perceptions of workplace performance within South African organizations.

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The association between learning styles and self-perceptions of workplace performance within South African organizations

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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ABSTRACT

Individual learning style or the way in which individuals learn best and the factors affecting individual learning style have been studied widely in the context of academic performance. In this research study, a focus is placed on learning styles in the workplace and how it associates with self-perceived workplace performance effectiveness within the South African corporate context. Kolb's Learning Style Theory has been used as the basis of investigation, using Kolb's Learning Style Inventory and Performance Criteria to find possible associations between the two constructs using the statistical technique of inter-battery factor analysis. The impact of individual personality and perceived satisfaction on learning style and educational performance outcomes have been conducted before, but never looking at the direct underlying latent dimensionalities that associate learning style and performance within a South African and workplace context.

Upon surveying employees, analysis of the results showed that a strong emergence of certain learning style dimensions and two new somewhat polarized dimensionalities associating learning style and workplace performance effectiveness emerge, with some minor shared items occurring between the two dimensions or factors as well. This research report will firstly discuss which of Kolb's learning style dimensions prominently emerge and relate to workplace performance effectiveness. Secondly, it will discuss how the two newly emerging dimensions or associations show underlying contrast or overlap, and how the factors forming these dimensions are relevant and actually arise and interact within a dynamic work environment.

Keywords and terms: Learning Style, Workplace Learning, Work Style, Work Satisfaction, Performance Effectiveness, Adult Learning, Kolb's Experiential Learning Style Theory, Personality Traits, Inter-battery Factor Analysis.

DECLARATION

I, *Bhavisha Amrat Bhoola*, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Bhavisha Amrat Bhoola

Signed at ……

On the …….. day of …… 20…..

DEDICATION

This research study report represents the culmination of my Master's Degree in Business Administration and all that has gone behind it. I would like to dedicate this research dissertation to all that I stand for, value and believe in. To my loving, enduring and encouraging family; To my Sister, who has always supported me and stood by me from the very beginning, and through yet another big milestone; To my Brother, who has been my best critic and strongest advocate; To my Aunt, who has always provided me with the needed guidance and steering, and To my Parents, who have been my deeply anchored pillars of strength.

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TABLE OF CONTENTS

ABSTRACT ..... **ii**

DECLARATION ..... **iii**

DEDICATION ..... **iv**

ACKNOWLEDGEMENTS ..... **v**

LIST OF TABLES ..... **x**

LIST OF FIGURES ..... **xii**

1 CHAPTER 1. INTRODUCTION **1**

1.1 PURPOSE OF THE STUDY 1
1.2 CONTEXT OF THE STUDY 1
1.3 PROBLEM STATEMENT 3
1.3.1 MAIN PROBLEM 3
1.3.2 SUB-PROBLEMS 4
1.4 SIGNIFICANCE OF THE STUDY 4
1.5 DELIMITATIONS OF THE STUDY 6
1.6 DEFINITION OF TERMS 7
1.7 ASSUMPTIONS 7

2 CHAPTER 2. LITERATURE REVIEW **9**

2.1 INTRODUCTION 9
2.2 DEFINITION OF TOPIC OR BACKGROUND DISCUSSION. 9
2.3 WORKPLACE LEARNING 11
2.4 ADULT LEARNING 13
2.5 INDIVIDUAL LEARNING 14
2.6 ADAPTIVE LEARNING 15
2.7 FORMAL LEARNING 15
2.8 INFORMAL LEARNING 15
2.9 COGNITIVE STYLES 15

2.10 LEARNING STYLES 16
2.10.1 ELEMENTS OF LEARNING STYLE 16
2.10.2 FACTORS INFLUENCING INDIVIDUAL LEARNING STYLE 19
2.10.3 THE RELATION OF LEARNING STYLES AND MODE OF INSTRUCTION 21
2.10.4 THE INFLUENCE OF INTELLIGENCE ON LEARNING STYLE AND ACHIEVEMENT 22
2.10.5 SOCIO-ENVIRONMENTAL AND SOCIO-CULTURAL FACTORS INFLUENCING LEARNING STYLE 24
2.10.6 IDENTIFYING APPROPRIATE LEARNING STYLE INSTRUMENTS: 25
2.10.7 USING KLSI 3 AS THE BASIS OF DETERMINING THE DIMENSIONS OF INDIVIDUAL LEARNING STYLE: 27
2.10.8 PROPOSITION 1 32
2.11 WORKPLACE PERFORMANCE 32
2.11.1 THE ASSOCIATION BETWEEN WORK PERFORMANCE EFFECTIVENESS AND NATURE OF WORK ROLES 33
2.12 DETERMINING THE ASSOCIATION OF LEARNING STYLE AND LEARNING EFFECTIVENESS TO WORKPLACE PERFORMANCE 36
2.12.5 PROPOSITION 2 43
2.13 CONCLUSION OF LITERATURE REVIEW 43
2.13.1 PROPOSITION 1: 45
2.13.2 PROPOSITION 2: 45

3 CHAPTER 3. RESEARCH METHODOLOGY 46

3.1 RESEARCH METHODOLOGY / PARADIGM 46
3.2 RESEARCH DESIGN 47
3.3 POPULATION AND SAMPLE 48
3.3.1 POPULATION AND SAMPLE FRAME 48
3.3.2 SAMPLE AND SAMPLING METHOD 48
3.4 THE RESEARCH INSTRUMENT 50
3.5 PROCEDURE FOR DATA COLLECTION 50
3.6 DATA ANALYSIS AND INTERPRETATION 52
3.6.1 THE INDEPENDENT VARIABLE IS LEARNING STYLE: 52
3.7 LIMITATIONS OF THE STUDY 56
3.8 VALIDITY AND RELIABILITY 57
3.8.1 EXTERNAL VALIDITY 57
3.8.2 INTERNAL VALIDITY 59
3.8.3 RELIABILITY 60
3.9 DEMOGRAPHIC PROFILE OF RESPONDENTS 61
3.9.1 DEMOGRAPHIC PROFILE RELATING TO AGE: 62
3.9.2 DEMOGRAPHIC PROFILE RELATING TO GENDER: 63
3.9.3 DEMOGRAPHIC PROFILE RELATING TO QUALIFICATION LEVEL: 64
3.9.4 DEMOGRAPHIC PROFILE RELATING TYPE OF INDUSTRY: 65
3.9.5 DEMOGRAPHIC PROFILE RELATING TO WORK POSITION 66
3.9.6 DEMOGRAPHIC PROFILE RELATING TO PROFESSION: 67
3.9.7 DEMOGRAPHIC PROFILE RELATING TO WORK EXPERIENCE: 68

4 CHAPTER 4. PRESENTATION OF RESULTS 69

4.1 INTRODUCTION 69

4.2 RESULTS PERTAINING TO LEARNING STYLE 69

4.3 RESULTS PERTAINING TO ASSOCIATION WITH PERFORMANCE EFFECTIVENESS 70

4.3.1 SUMMARY OF EIGENVALUES: 72

4.3.2 PARALLEL ANALYSIS AS THE METHOD FOR FACTOR RETENTION: 73

4.4 SUMMARY OF THE RESULTS 75

4.5 LIMITATIONS 76

5 CHAPTER 5. DISCUSSION OF THE RESULTS 78

5.1 LEARNING STYLE DIMENSIONS IN THE WORKPLACE 78

5.1.1 THE PROMINENT LEARNING STYLE DIMENSIONS AND LEARNING STYLES OF EMPLOYEES IN THE WORKPLACE 79

5.2 ASSOCIATIONS BETWEEN INDIVIDUAL LEARNING STYLE AND THE SELF-PERCEIVED EFFECTIVENESS OF INDIVIDUAL WORK PERFORMANCE. 81

5.2.1 THE DIMENSIONS REVEALED FROM THE TWO FACTOR SOLUTION 82

5.2.2 RELATING THE NEW DIMENSIONS TO KOLB'S THEORY 84

5.2.3 THE ROLE AND EFFECTS OF PERSONALITY TRAITS: 86

5.2.4 THE ASSOCIATION OF PERSONALITY AND PERCEIVED SATISFACTION WITH LEARNING STYLE AND PERFORMANCE EFFECTIVENESS: 88

5.3 CONCLUSION 92

6 CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS 94

6.1 CONCLUSIONS ON WORKPLACE LEARNING STYLES: 94

6.2 CONCLUSIONS ON THE ASSOCIATION BETWEEN LEARNING STYLE AND WORKPLACE PERFORMANCE EFFECTIVENESS: 95

6.3 CONCLUSIONS OF THE STUDY 96

6.4 RECOMMENDATIONS TO ORGANIZATIONS 98

6.5 SUGGESTIONS FOR FURTHER RESEARCH 100

6.5.1 THE EFFECT OF DEPENDENT VARIABLES (DEMOGRAPHIC FACTORS) ON WORKPLACE LEARNING USING A LEARNING STYLE FRAMEWORK: 100

6.5.2 LEARNING STYLES IN INDIVIDUALS WITH LEARNING CHALLENGES 101

6.5.3 THE EVOLUTION OR CHANGE OF AN INDIVIDUAL'S LEARNING STYLE THROUGH THEIR CAREER 102

REFERENCES 104

APPENDIX A: Letter to Respondents 112

APPENDIX B: Research Instrument / Research Questionnaire 114

LEARNING STYLES AND PERFORMANCE EFFECTIVENESS QUESTIONNAIRE..... 114

APPENDIX C: Kolb's Learning Style Inventory (KLSI) Version 3, Cycle and Grid..... 149

C1. KLSI Version 3: 150

C2. Kolb's Learning Style Inventory, Cycle & Grid: 151

APPENDIX D: Tables of Results showing Unrotated Factor Loadings 155

LIST OF TABLES

Table 1: Differences between adult learning and pre-adult learning (Dinmore, 1997, p. 466-467) 13

Table 2: The various elements constituting individual learning styles (Boyle, 2012; Dunn & Dunn, 1993) 18

Table 3: The four learning styles in relation to five levels of behaviour (Kolb, 2005) 28

Table 4: Learning styles and preferred career fields (Kolb, 1984) 37

Table 5: Learning styles and best fit job role (Kolb, 1984) 37

Table 6: Learning style and complementary skills and competencies (Kolb, 1984) 40

Table 7: Eleven ways or performance criteria that informs individual learning (Buch & Bartley, 2002; Gerber, 1998; and Svinicki & Dixon, 1987) 41

Table 8: Table of respondents 48

Table 9: Rotated Factor Loadings of Learning Style items 69

Table 10: Summary of Rotated Factor Loadings for Performance Effectiveness Items 70

Table 11: Screen plot of the Eigenvalues of the two factor solution 72

Table 12: Table of Kolb's Learning Style Inventory (KLSI) 3 sourced and created from the following attached document of Kolb's original Learning Style Inventory 150

Table 13: Unrotated Factor Loadings of Learning Style items 155

Table 14: Unrotated Factor Loadings of Performance Effectiveness items.... 156

LIST OF FIGURES

Figure 1: The relation between an individual's brain hemispheres and learning styles (Kolb, 2005) 19

Figure 2: An illustration of Kolb's Learning Style Model (Kolb, 2005)..... 30

Figure 3: The broad areas for evaluating management effectiveness (Hockings, 2000)..... 34

Figure 4: Competencies involved in the management cycle process (Hocking, 2000)..... 35

Figure 5: The correlation between learning style dimensions and personality dimensions (Kolb, 2005) 39

Figure 6: Graphical representation of Exploratory Factor Analysis (Stacey, 2015, p 29)..... 54

Figure 7: Graphical representation of Inter-battery Factor Analysis (Stacey, 2015, p 9)..... 55

Figure 8: Bar graph representing respondent's ages 62

Figure 9: Pie chart representing respondent's gender 63

Figure 10: Bar graph representing respondent's qualification levels..... 64

Figure 11: Bar graph representing respondent's industry type..... 65

Figure 12: Bar graph representing respondent's work positions 66

Figure 13: Bar graph representing respondent's professions..... 67

Figure 14: Bar graph representing respondent's work experience..... 68

Figure 15: Inter-battery Factor Analysis representation of two factor solution.. 75

Figure 16: Interactions between learning style, personality, perceived work satisfaction and self-perceived performance effectiveness in the workplace. .. 91

1 CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this study is to understand the association between individual learning style and the self-perceived effectiveness of work performance within the South African workplace context.

1.2 Context of the study

In line with the thinking of Kotter (2007), in a dynamic and changing world, it has become vital to be able to 'lead change'. This can only be done if an organization is prepared for the change even before it occurs, engages effectively during the occurrence of change and then has the ability to adapt and consistently transform the organization even after the change has occurred. This transformation effort, whether on an individual or organizational level, requires learning.

It has been explained by Fiol and Lyles (1985) and Correl and Gregoire (1998) in the past, and recently by Thom-Otuya, Precious, and Agabe (2014), that learning includes both organizational and individual learning, which is essential for an organization to maintain its competitive advantage. Organizations therefore need to learn from the past experiences of its individuals but also respond promptly to the unexpected, by applying a reflexive thinking approach. This ability to be resilient, forms a critical aspect for the long term success and longevity of an organization.

Individual learning may take place formally through various learning or training methods and employee development approaches. This would require more formalized learning styles. According to Abdul-Rahman and Du Boulay (2014) and Kolb (1984), individual learning styles can be self-motivated and informal by being either active or reflective. A person therefore learns predominantly either

through experience or through reflective thinking on past experience. It has been explained that learning style influences the amount of committed effort an individual places into their work as well as the amount of information an individual retains. Paas, Tuovinen, Van Merrienboer, and Darabi (2005) and Graf, Liu, Chen, and Yang (2009) confirm that there is a significant relationship between individual preference in learning style and information retention capacity, and thus the ability to learn and develop.

As accounted for by Cassidy (2004), the impact and associations that learning style has to learning as well as performance has become increasingly relevant both in education as well as in the workplace. Research in the area of learning style has been conducted in many areas of work outside psychology from which many central concepts and theories have originated. These areas of work include medical and health care training, management, industry, vocational training and other settings. The centrality of learning or training and development in all areas of work and not only in the education sector itself is the reason that the applications of these concepts are so wide ranging and relevant.

While there has been research done in the area of learning itself, much of the literature shows that it has been done for learners or students for the purposes of educational learning and not much in the area of workplace learning. Existing research focused on organizational learning attempts to articulate and define the relationships between the concepts of learning culture, organizational culture and learning organizations. Argote (2012); Fiol (1994); Fiol and Lyles (1985); Garvin, Edmondson, and Gino (2008); Mahler (1997); Macdonald (1995); and Rijal (2010), have all written about aspects of organizational learning culture, organizational learning, and the influence of these amongst other factors on the development of a learning organization. Instead, this study focuses specifically on individual learning and not on organizational learning. Thus, the concepts of organizational learning, organizational culture, learning culture or the

development of a learning organization are not relevant in this study despite all being related to the outcomes of this study.

Furthermore, this study aims to be more specific by focusing on learning style and the factors affecting individual learning styles in the workplace context rather than broader areas such as learning culture, the learning environment, learning structure, the learning process or learning outcomes. In other words, the study looks specifically at the learning styles of employees and the way the employees associate or relate these learning styles to effective performance. The aim of this study is to understand this association within a generalised workplace environment rather than a specified industry or sector. This would indicate how employees believe effective work performance is fostered by an individual's learning style within the work environment.

Learning is an imperative part of an organization as organizations are now more than ever seen as learning systems, especially as the management process is viewed as a process of learning, and every individual has their own type of learning style preference and learning method preference through which their learning is most conducive. This is why it is significant to understand the nature of the association between individual learning styles and self-perceptions of individual performance effectiveness in the workplace. Thus, this research report seeks to understand the nature and underlying dimensionalities of this association within South African organizations.

1.3 Problem statement

1.3.1 Main problem

To determine whether certain types of individual learning styles have a greater association than others to self-perceived performance effectiveness within the workplace.

1.3.2 Sub-problems

The first sub-problem is to determine the individual learning style dimensions that emerge within the workplace.

The second sub-problem is to determine whether there are associations between the individual learning style dimensions and self-perceived performance effectiveness in the workplace.

1.4 Significance of the study

This study plays a significant role, as not much focus in past or recent research has been placed on the importance of individual learning or learning styles in specific relation to workplace learning, more specifically within the South African workplace context. Extensive research within the past decade has been found on learning styles itself and its relation to learning in the education sector and on e-learning adoption, however, very few studies have been done within the workplace context. Many studies that have looked at learning, have been centred on organizational learning in the development of learning organizations rather than individual workplace learning. In direct relation to this study, recent studies such as Boyle (2012) have been on the relation of learning style to workplace learning specifically within the law profession. Another study by Hassan et al. (2012) has explored the factors affecting the learning styles of students. These studies will therefore be adapted to the workplace context, thus focusing on individual workplace learning and learning styles within South African organizations.

As discussed by Hassan et al. (2012), the importance of learning styles of individuals to the way they learn at work is explored. Individual learning styles in the workplace is said to inform the way in which learning is rendered to these individuals in that particular environment, thus affecting workplace learning of these individuals (Read & Kleiner, 1996). It is important to develop an effective

way or style of learning within a particular division which is suited to the learning styles of its members. However, the reverse could also be true, where individual learning styles are affected or shaped by workplace factors and how learning takes place in a particular work environment (Brunken, Plass, & Leutner, 2003).

Firstly, as discussed by Hassan et al. (2012), considering individual learning style and the factors affecting it, could act as an instrumental factor in employee development for an organization, as individual learning styles may influence the way employee development programs are constructed and conducted within organizations (Buch & Bartley, 2002). In addition, it may also be an important consideration in forging and developing learning strategies as well as planning team and knowledge building endeavours and exercises for employees. The learning strategy can then be aligned to the predominant learning style, so as to optimize learning and outcomes in the division (Brunken et al., 2003).

Secondly, individual learning style may be an important consideration in the development of effective work teams within a division and could play a critical role in work teams meeting outcomes effectively and in creating conducive workplace environments for effective workplace learning (Brunken et al., 2003).

Thirdly, knowing the preferred learning style of individuals and what affects it could play an important role in improving the tedious task performed by an organization's employee selection committee or personnel in determining whether an individual would make an ideal and suitable candidate for a position. This is evident as an individual's learning style influences the type of work or role they adopt within a company and in turn the professional role also affects their learning style (Kim, Jun & Han, 2006 and Brunken et al. (2003). Thus, a learning style inventory could be used in the employee selection process to determine a candidate's suitability for the role and environment, and furthermore to determine whether their learning style is congruent to that required by the roles of the job and to ensure effective workplace performance (Yi, 2005).

Fourthly, the importance of knowing the individual learning styles of individuals within a division or company is because different people from different levels of work experience and backgrounds work together, thus the ways in which they learn and retain information vary (Joy & Kolb, 2009). It is relevant in the context of all industries as change is now global, constant and rapid. This includes changes in policy, legislations, regulations, product demands, value propositions, information age and technological advances, research and development investments, changes in distribution lines as well as change in target markets or value chains. Thus, being aware of one's own learning style and the association it has to factors affecting ones perception of effective performance in the workplace could importantly inform the adoption and rendering of the most effective learning approach and learning strategy that is aligned to the learning styles of the employees. This dynamic would be a significant driving factor for successful learning and effective performance to be fostered within the organization (Aisami, 2015; Boyle, 2012; Yi, 2005).

This study may therefore provide guidance to managers on how best each of their employees learn and how to create an ideal environment and provide conducive learning tools and resources to foster effective formal and experiential learning for continued effective and competent work performance. The aim is to not use a generic or 'one size fits all' approach to workplace learning, in order to optimize workplace performance effectiveness for all (Gerber, 1998; Mansfield, 1996).

1.5 Delimitations of the study

This study focused on:

- 'Learning styles' and not 'learning culture' and 'organizational culture', as building a 'learning culture' takes place over time and requires the consideration of multiple acting factors.

- Individual learning styles and not learning methods, organizational learning, learning outcomes or any other related sub-area of learning.
- Self-perceived individual performance effectiveness in the workplace and not organizational learning and performance.
- South African corporate organizations located in the city of Johannesburg.

This study specifically focused on learning styles and its dimensions and its association to performance effectiveness rather than on broader areas such as learning culture, the learning environment, learning structure or learning outcomes. This study looked specifically at how individual learning takes place as per individual learning styles and in which ways this is associated with the self-perceived effectiveness through which an individual performs their work in the workplace.

1.6 Definition of terms

1.6.1 Learning Style:

Learning Styles are defined as the best or preferred way by which an individual receives and retains and applies information and skills in a certain period of his or her development. It simply refers to the way in which an individual is able to learn or receive and retain information optimally. This is the way by which they can concentrate, absorb and remember information to a greater extent as opposed to through other means (Dunn, 1984; Kolb, 1984).

1.7 Assumptions

The following assumptions were made in conducting this research study:

- Research respondents have an interest, candour and a willingness to invest in the research process. If not, this may have affected the data and consistency of the responses.
- The respondents have an adequate knowledge and understanding on the concepts of workplace learning and learning style. If the respondent did not have a clear understanding, the responses can be deemed inaccurate and invalid.
- The respondents have engaged in learning activities at their workplace. If they have not engaged in learning activities, the questions were unanswerable and irrelevant to the respondents. However, if answered, the responses would be untrue.
- The respondents have performed or engaged in the roles and tasks that have been listed on the survey. If they have not, the response would not be valid.
- The respondents are sufficiently self-aware, and are well seasoned on how they learn best and what factors they are most influenced by regarding their learning style (i.e. the way in which they learn best). If they are not self-aware, the responses would be inaccurate.
- The respondents have answered the questionnaire with honesty and transparency, exhibiting no bias towards a particular learning style for a socially desirable response. If the respondent was not objective and responded with any bias, the accuracy of the response would be affected.
- The respondents, to a certain extent other than that explained, understand the factors proposed to them, and understand the effect of these aspects on their own learning at work. If the respondents are unaware of the factor in question then answering the questions would have been a challenge, thus affecting response validity.
- The researcher and respondents were consistent throughout the duration of the data collection period and the research process. If this was not the case, the data would be considered as being compromised.

2 CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

Following from the context on learning and the specific factors that affect learning provided in chapter 1, this literature review provides a more detailed view and interpretation on the application of the literature pertaining to the subjects of workplace learning, learning style and performance effectiveness. The two main concepts of this research, which are learning style and workplace performance are explored further, in order to identify the associations between learning style and workplace performance. Any existing research on the relation between these two concepts are reviewed through the literature. At the end of the literature review, a theoretical framework with the existing dimensions of learning styles and performance effectiveness measures are established, which give rise to research propositions and research questions.

2.2 Definition of topic or background discussion.

Learning in general is described as “the development of insights, knowledge, and associations between past actions, the effectiveness of those actions, and future actions” (Fiol & Lyles, 1985, p. 811). It can be modestly explained as the means of adapting to changes, developing greater awareness or understanding on matters, developing new structures and systems for execution, and unlearning or remedying old or ineffective ways through re-learning new ways, in order to improve future performance. Learning is further explained to exist beyond repetitiousness but rather as developing a refreshingly new understanding, where “re-search in the area of cognitive and behavioural sciences at the individual level describes this process as involving the acquisition and interpretation of knowledge” and “the process of modifying one's cognitive maps or

understandings, thereby changing the range of one's potential behaviours" (Fiol & Lyles, 1985, p. 811).

With reference to the workplace, all change requires learning, however, all learning does not require change. Therefore, learning cannot always be equated to adaptation (Fiol & Lyles, 1985). Learning is an effective type of change as it is a conscious effort to interpret problems effectively by applying newer and smarter knowledge systems rather than ignoring them due to ignorance (Mahler, 1997).

According to Gravett (2005), learning can be short term through the active acquisition of individually contrived concepts through experiences or interaction with the environment or it can be long term by relating the individually learnt concepts and experiences into interlinked knowledge systems for cognitive understanding.

Learning is conceived as a process, and not merely on the basis of the outcomes of the learnings. In order to improve learning in higher education, the primary focus should be on encouraging students to become more involved in their own learning process and to actively receive feedback on the effectiveness of their learning efforts. It is stated that "...education must be conceived as a continuing reconstruction of experience: ... the process and goal of education are one and the same thing" (Dewey, 1897, p. 79).

It is elaborately discussed by Kolb and Kolb (2005) that all learning is relearning, which occurs best when it is supported by a students' beliefs and ideas about a topic or subject so that their understanding can be appropriately evaluated and integrated with new and more refined ideas. Conflict, differing views, and disagreements are what drive the learning process. In the process of learning, an individual is forced to shift between the opposing modes of reflection and action, as well as feeling and thinking. Kolb and Kolb (2005) explained this as a holistic process of adaptation to the world and not just the result of cognition, as it

involves the integrated functioning of an individual which involves a combination of all the aspects of thinking, feeling, perceiving, and behaving.

Furthermore, learning can be experiential, where new knowledge, skills and attitudes are achieved through four different modes or abilities. These are concrete experience, reflective observation, abstract conceptualization and active experimentation. These types of different experiences are reflected upon, comprehended and used in decision-making and problem solving, thus viewing knowledge as the transformation of experience (Kolb, 1984).

Learning results from synergetic transactions between the person and the environment. In Piaget's terms as explained in Kolb and Kolb (2005), learning occurs through equilibration of the dialectic processes of assimilating new experiences into existing concepts and accommodating existing concepts to new experience. Learning is the process of creating knowledge where social knowledge is created and recreated in the personal knowledge of the individual. This contrasts the idea that the "transmission" model on which much current educational practice is based, where existing fixed ideas are transmitted to the learner and is not created through experiential learning (Kolb, 1984; Kolb and Kolb, 2005).

This underlying theory that has been provided gives an understanding and foundation for all the discussions that will follow throughout this research report. The most relevant and important terms and definitions that will be used in this study are: workplace learning, adult learning, learning styles, learning style inventory, and performance effectiveness. These terms together with others worth understanding, will be further explored going forward.

2.3 Workplace Learning

There have been a number of conceptualizations of workplace learning in the past, one of which was by Billett (1994) and Billett (2001), who saw it as the

acquisition of knowledge and skills and treated it as a function of participation in authentic tasks, with support and guidance, either direct or indirect, from others more skilled. In the workplace, the learners are the employees, for whom three forms of learning have been identified:

- Propositional (knowledge about),
- Procedural (knowledge of how), and
- Dispositional (values and attitudes).

Using a similar conceptualization, Mansfield (1996) developed the Job Competence Model identifying the skills involved in four aspects of competence:

- Task or technical skills,
- Task management skills (planning, decision making, prioritizing),
- Contingency management skills (managing unexpected events and events beyond the scope of routine instructions),
- Role and environment skills (understanding, working in, and using the physical, organizational, and cultural environment). Workplace learning was thus conceptualized in the forms of knowledge or skill that represent the outcomes.

Very early on, an instructional model of workplace learning was studied by Levy (1987) and Smith (2003), which focused on the structure and processes of learning by linking employee learning to the work role. It was suggested that there are three interrelated components that link learning to workplace activity:

- Structuring learning in the workplace,
- Providing appropriate on-the-job training or learning opportunities, and
- Identifying and providing relevant off-the-job learning opportunities.

2.4 Adult Learning

Adult learning has been differentiated from that by learners as it is said to be self-directed, self-organized and self-motivated. It is also differentiated through age by saying that older generations have a greater range of personal, social, psychological experience that influence their perceptions. They can therefore interpret and apply their knowledge more readily to real life situations. Adult learning is more informal, collaborative, and more practical (Dinmore, 1997).

As learning in the education sector and learning in the workplace is different, a tabulation of the differences between adult learning and pre-adult learning can be seen in *Table 1 (*Dinmore, 1997, p 466-467*).* The table shows that adults, who apply their learning in the workplace for various different purposes is different to students or pre-adults who apply their learning in the classroom. It can be noted that the fundamental difference between adult and pre-adult learning is experience, as experiential learning forms a major part of how adults learn as it creates knowledge through the "transformation of experience" (Kolb, 1984, p. 38; Kolb, Boyatzis, & Mainemelis, 2001). Thus, measuring the effectiveness of the performance of group would also differ due to differences in such contextual factors.

Table 1: Differences between adult learning and pre-adult learning (Dinmore, 1997, p. 466-467)

Category	Criterion	Pre-adult	Adult
Definition, Role	1. Age	Younger	Older
	2. Primary social role	Leaner	Worker
	3. Secondary role	Worker	Learner
	4. Informal learning from	Family, peers	Co-workers, peers
Interactions in primary role	5. Daily environment	School	Work
	6. Supervised by	Parents, teachers	Managers, may be a supervisor
	7. Family role	"subordinate"	Co-supervisor
	8. Interaction with	Learners of the same age	different ages & different jobs

Category	Criterion	Pre-adult	Adult
How learning takes place	9. Learning environment is (primary)	Formal	Informal
	10. Knowledge acquired through	1) Books, media etc. 2) Experience	1) Experience 2) Books, media etc.
	11. Formal learning takes place	Individually	Collaboratively
	12. Informal learning takes place	In groups or either	Either
Motivation	13. Impetus for learning	Directed, increasingly self-directed,	Usually self-directed
	14. Reasons for learning	to fulfil social role, learning	Self-enrichment, promotion, financial problem solving.
Problem	15. Education for	Role, Learning	Problem solving
	16. Motivation	External	Internal
Learning environment etc.	17. Characteristics as leaner	Daily environment	Unaccustomed
	18. Learning In daily environment	Education	Training
	19. Barriers to learning	1) Lack of experience 2) Lack of motivation 3) Lack of power 4) Difficulty in applying to real world	1) Lack of skills (qualification, writing, thinking) 2) Lack of theoretical base 3) Lack of time 4) Vulnerable (cut-off)

2.5 Individual learning

Individual learning are the lessons learnt by individuals through various means, which can be formal or informal. These lessons learnt by the individual employees become organizational learning when they are institutionalized formally as standard procedures or informally as rules or routines, ensuring their survival through the evolution through time of the organization. This is why organizations focus on finding ways to speed and shape the learning of individuals, which then essentially benefits the organization (Mahler, 1997).

2.6 Adaptive learning

Adaptation or adaptive learning is explained as “the ability to make incremental adjustments as a result of environmental changes, goal structure changes or other changes” (Fiol & Lyles, 1985, p. 811).

2.7 Formal Learning

Formalized learning can take place through structured training programs, employee development, coaching programs and mentoring where the content, purpose, location, and process is structured for specific outcomes (Hodkinson & Bloomer, 2002).

2.8 Informal Learning

Informal learning take place without the use of clearly structured systems, which include learning through past individual experiences, reflection, interpersonal learning, and social or environmental interactions and feedback. Informal learning is the part of learning that is for voluntary reasons, when one is largely unaware that they are actually learning and the setting is informal, social or unplanned (Hodkinson & Bloomer, 2002), which is how most learning in the workplace environment takes place throughout an individual’s work life and career. Informal learning has been used increasingly in adult education as it recognizes the social significance of learning from other people, it has greater flexibility and a larger scope for individual agency and is complementary to learning from experience (Eraut, 2004).

2.9 Cognitive Styles

As per Messick (1984), cognitive styles of individuals or the way in which individuals think directly emanates from differences between their preferred ways

of organizing and processing information. Therefore, cognitive style is largely related to learning style and both terms have been used interchangeably in previous literature (Sadler-Smith, 2001). Therefore, the common factor between learning style and cognitive style is related to how the mind processed information and how this affects an individual's perceptions (Dunn, 1984).

2.10 Learning Styles

The way in which an individual reacts to their learning environment and its various elements encompasses ones learning style or also referred to as ones learning preferences (James and Blank, 1993). Individuals have their own way of receiving, perceiving and processing information, which develops as a result of the interaction of many factors. Learning Style is thus said to be a dynamic state that is influenced by several factors. These factors can be internal such as hemisphericity (left/right or analytical/global) or external such as the learning environment, interaction level, motivation, satisfaction, level of structure and level of conformity required (Cassidy, 2004; Dunn, Beaudry, & Klavas, 2002; Graf et al., 2009).

2.10.1 Elements of learning style

The elements of learning style have been shown to differ between different models developed by different theorists. It is a concept that dates back into the seventies, when conceptualized by Dunn, Dunn, and Price (1979). It has been cited and described by Boyle (2012) and Lovelace (2005) as a model that includes eighteen characteristics that influence these individual perceptions or an individual's learning style. These perceptions were then said to be shaped by five sets of stimuli, which were used to diagnose individual learning styles. These are environmental, emotional, sociological, physical and psychological stimuli. These were further divided into the elements or factors (Dunn, 1984), and includes chronobiology as part of learning style, where some individuals are 'morning

people' and others 'night owls' (Dunn et al., 2002). These factors include the external work environment, the individual's capacity to remember information, apply critical thinking when learning Andreou, Papastavrou, and Merkouris (2014) as well as the complexity of the task or situation at hand (Abdul-Rahman & Du Boulay, 2014).

According to the Dunn and Dunn model, the twenty-one basic elements of learning style or factors affecting students' motivation and performance are evaluated for each individual learner. According to this model, these elements can be segmented into the following five categories (Boyle, 2012 and Lovelace, 2005):

- Environmental factors (i.e. sound, light, temperature and seating design),
- Emotional factors (i.e. motivation persistence, responsibility (conformity vs non-conformity),
- Sociological factors (i.e. learning best alone, in pairs, in a small group or as part of a team, with authoritative or a collegial adult, and preference between variety of patterns and routine),
- Physiological factors (i.e. perceptual strengths of auditory, visual, kinaesthetic or tactual, time of day energy levels, need for intake and mobility while learning), and
- Psychological factors (i.e. global vs analytical processing style elements, right or left brain hemisphere dominant, and impulsive or reflective).

The selected elements that constitute the learning style inventory by Dunn (1984) include sound, light, temperature, design, perceptual strengths and weaknesses, intake, time of day, mobility, motivation, persistence, responsibility, sociological preferences, global or analytic, reflective or impulsive, field independence or dependence and left or right brain hemispheric inclination (see *Figure 1*). Individual preference for certain of these factors would allow for determination of the most significant factors influencing a person's learning style.

The twenty-three recognized elements that fall into these five categories can be seen in *Table 2:*

Table 2: The various elements constituting individual learning styles (Boyle, 2012; Dunn & Dunn, 1993)

Perceptual Elements as part of the Physiological elements	***Physiological elements***	***Sociological elements***	***Psychological elements***	***Environmental elements***	***Emotional elements***
Auditory Visual picture Tactile Kinaesthetic Verbal (internal) Presenting through all perceptual strengths of audience	Preferred time(s) of the day Intake of food Mobility	Working well with others or not Preference for working with an expert (authority-oriented) Varied preferences or routine	Global or analytical colleagues when writing a report Global or analytical colleagues when doing a presentation Impulsive or Reflective person	Quiet or sound Bright or soft lighting Warm or cool temperatures Formal or informal seating while concentrating	Motivation Persistence Responsibility Structure

Self-awareness or the ability of individuals to recognize that certain factors are strongly preferred by individuals are in fact their strengths, supports the validity of responses, and it proves that these are the factors make it easier for the individual to absorb and retain information or in other words to learn. Thus, these factors form the ‘learning style’ of the person. Less importantly, factors that people are unaware of do not affect them, and are not significant in the development of their learning style and do no create a complementary environment for learning (Dunn, 1984). This means that individuals are easily able to identify factors that are their strong preferences, whether strongly positive or strongly negative. On the other hand, they usually have difficulty and hesitation

in answering questions where their preferences are not that significant (i.e. that which does not occur naturally).

In *Figure 1*, the concepts of left and right brain hemispheres can be understood in relation to cognitive processing and an individual's learning style:

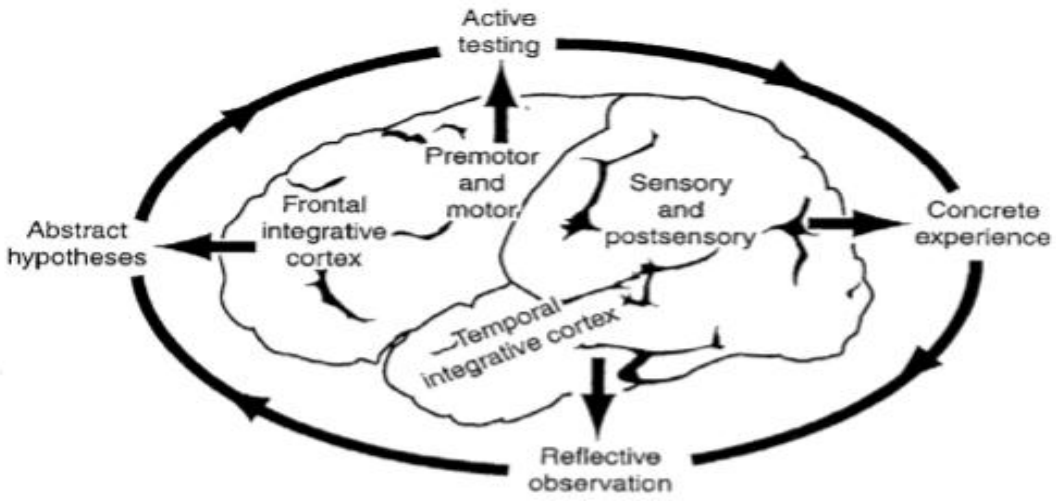


Figure 1: The relation between an individual's brain hemispheres and learning styles (Kolb, 2005)

2.10.2 Factors influencing individual learning style

D'Amore, James, and Mitchell (2012) show the importance of learning style on individual learning and explain that the following are factors that influence learning style:

- environmental work setting preference,
- information processes, and
- learning methods,

Dunn (1984) showed that when learners were matched with methods, resources and environments that complemented their learning style preference, this is when

they achieved statistically higher performance than when they were mismatched with their learning style preferences (Dunn et al., 2002).

Hassan et al. (2012) found seven new factors that affect students learning styles, which were found to be: attitude before and after attending class, strategies used to comprehend the lecture, the importance placed on the lecture, class size and its condition, efforts outside class, classroom convenience, and importance placed on actually listening to the lecture. Furthermore, he found differences based on demographic differences in individuals, indicating that factors such as age, gender, field on work, and experience play important roles in determining ones learning style and can therefore influence one's work performance as well.

Kolb (1984) and Brunken et al. (2003) also found that personality characteristics (Furnham, Forde, & Ferrari, 1999; Furnham, Jackson, & Miller, 1999; Furnham & Miller, 1997) prior knowledge learned, previous experiences and an individual's abilities and competence also play a role in developing a learning style and their work performance. However, it is also shown that not all personality types reinforce one's learning style and performance (Bokhari, 2011).

These factors can thus be seen to have associations with an individual's performance in the workplace. It can therefore be implied that these factors that affect an individual's learning style also affects the effectiveness of their workplace performance. A factor analysis study on personality and coping traits by Ferguson (2001) showed that neurotic-introvert and psychoticism type behaviours are negatively enforcing and that extroversion and social support seeking type behaviours can be positively reinforcing towards coping with work performance and also affects self-perceived satisfaction and ability to cope with work stress. Furthermore, self-perceived satisfaction (Cole, Shelley, & Swartz, 2014; Eom, Wen, & Ashill, 2006; Gurpinar, Alimoglu, Mamakli, & Aktekin, 2010; Sun, Tsai, Finger, Chen, & Yeh, 2008; Tatjana Vasileva-Stojanovska, Toni Malinovski, Marina Vasileva, Dobri Jovevski, & Vladimir Trajkovik, 2015), and the way in which individuals participate in learning activities (Shaw, 2012) have been

found to be an important factor affecting learners learning styles, which is in itself influenced by learners anxiety, learning style (Hong, 2002), attitude (Pruet, Ang, & Farzin, 2014), flexibility, and comfort with diverse work content.

All of these factors can be viewed as interdependent. The dimensions stated below were reasoned to be important for individually perceived learner satisfaction, which coincide with that for learning style, possibly signifying that the factors impacting learning style may have the same or overlapping sources as that for perceived learner satisfaction. These dimensions can be summed as:

- The Learner (self-efficacy/competence, anxiety, learning style)
- The Content (flexibility, quality, technology)
- The Environment (design, diversity, interaction).

The study by Sun et al. (2008) showed that improving satisfaction also improved application, and if applied in the same light to the workplace, it can be said that strengthening employee job satisfaction would strengthen performance of a work task.

2.10.3 The relation of learning styles and mode of instruction

As explained by Dunn (1984), employee learning styles can be determined and followed by individualizing instruction and implementing learning style specific designed programs for employees as an effective way of incorporating personalized and specific learning style based instruction in employee training and development programs (Buch & Bartley, 2002). This is in order to allow employees to learn through unique characteristics for significant gain and retention of information by matching their learning style preference or their perceptual strength. This can then translate into workplace performance with effective outcomes through improved attitudes, behaviour and persistence towards learning as showed when teaching was conducted through learning styles and using preferred multimedia types or modes of learning (Morris,

Finnegan, & Wu, 2005; Ocepek, Bosnić, Šerbec, & Rugelj, 2013). When learning or gaining information, the surrounding environment forms an important part of the individual adapting successfully. The design of the instructional and delivery environment is essential to create a responsive atmosphere for open and stimulated learning, where learners can easily participate and engage when learning (Huang, Lin, & Huang, 2012; Morris et al., 2005).

A preference to work individually through intrinsic motivation as opposed to collectivism or collaboration in groups through extrinsic motivation, to learn visual representation instead of auditory mediums, and kinaesthetic behaviour is all determined by a person's learning style (Irvine & York, 1995; Reid, 1987). Individual learning, individual worksheets, activities, projects, presentations and assignments are preferred by some individuals, whereas others benefit from co-operative group activities and work projects. There are six identified learning styles which are visual, tactile, auditory, kinaesthetic, group and individual (Dunn, 1984).

Students whose perceptual strengths were tactual or kinaesthetic instead of auditory or visual, learned better through either phonics or word recognition reading through either phonics or word recognition reading approaches. They thus learn better tactually (Dunn, 1984; Reid 1987).

2.10.4 The influence of intelligence on learning style and achievement

It can be interpreted from Dunn (1984) that the learning styles of talented individuals demonstrates self-motivation, independence, persistence, strong perceptual modalities and a need for options rather than structure. The higher the IQ of an individual, the more motivated they are and the less structure they require. It was also found that gifted or high performing individuals had preferences for evening rather than morning work, sound rather than quiet, and are high energy people with greater perceptual strength. However, average to underperforming individual's need more structure, a quiet work environment, and

are more right dominant. Reading achievement or an individual's ability to read has also been shown to influence their learning style more than intellectual capability or their intellectual quotient (IQ) does. Dunn (1984) differentiates between high and low achievers by deciphering that high reading achievers are more self-motivated, persistent, responsible, require little food intake, low to no mobility while learning, and learning alone in solitude, as opposed to low reading achievers who are less motivated, have reduced persistence, require more structure, an increased need for tactual and kinaesthetic inclusion, and a preference for supported or guided learning instead.

As posited by Lubben, Davidowitz, Buffler, Allie, & Scott (2010) and Hassan et al. (2012), an individual's learning style depends on several factors, and identifying the factors affecting students learning styles is significant as it may influence their academic performance. Thus, in the same way, factors affecting employee learning styles may influence the effectiveness of their work performance or the way in which they learn and apply their knowledge in the workplace. However, Chen (2011) as cited in Hassan et al. (2012) found that learning styles did not significantly influence learning or academic performance of students. Kim, Jun, and Han (2006) forward the idea that by understanding individual learning styles, these needs or preferences can be better met. Thus, workplace learning strategies can accommodate employees learning needs and preferences. Ayersman (1996) and Bontchev & Vassileva (2011) also confirm the dependency of learning objectives on learning styles and show that learning environments and instructional strategies can be designed and made conducive to learning styles in order to improve workplace performance of employees.

Certain factors affecting learning style parallel the growth curve by affecting individuals differently. Some factors reflect patterns for either high performance or underachievement. Thus, learning style factors are either genetic or biologically determined or developed as an outgrowth of experiences throughout life. These biological factors will not be considered in this study. Therefore, other

experientially determined factors, that either foster or inhibit achievement include sociological preferences, motivation, persistence, responsibility, and structure as such factors (Hasan et al., 2012).

2.10.5 Socio-environmental and socio-cultural factors influencing learning style

Creating value for organizations through learning and improved performance in the South African work environment and knowing the elements that relate learning style and effective work performance in the workplace is significant, especially when applying this knowledge to strategies for a range of services from general strategy, marketing, financial and operations to technology-based and outsourcing services within corporate firms. Thus, Hollins (2008) adds that cultural factors are crucial in shaping the way individuals learn, as each individual's unique background, culture and learning history must be considered to determine mediums of instruction as this influences their learning style, as cultural and life experience must be compatible with mediums of instruction in order to prevent emotional and communication blocks to interpreting and understanding instruction. Environmentally influenced cultural factors that affect the way individuals learn can be further segmented into the following (Irvine & York, 1995):

- Childhood socialization: The values of family, personal relationships, respect, trust, and sex role distinctions affect an individual's childhood social constructs.
- Socio-cultural tightness: This can be either high-context or low-context culture. High-context cultures are based on people and events, and gain knowledge using intuition and logic. On the other hand, low-context cultures view time as linear with tight schedules, where knowledge is gained by analytical reasoning and interpretation. The pace and timing of learning, interpretation of non-verbal behaviours, and the directness or

demeanour presented and expressed during speech is also influenced by this (DeCapua & Arbor, 2004).

- Ecological adaptation: Social environmental factors such as education level and the possession of skills affects learning style (Cunningham, McGinnis, Verdú, Tesliuc, & Verner, 2008).
- Language: Language reflects world views and forms a means through which individuals think and transform their thought processes and lifestyles into words, and affects the way in which people learn and interpret information (DeCapua & Arbor, 2004).

2.10.6 Identifying appropriate learning style instruments:

According to Dunn (1984), learning style instruments that are selected to identify individual learning styles must have reliability as well as face and construct validity, as the factors being assessed must be understandable, practical and comparable. As defined in the assumptions, understanding the factors that affect one's own learning style preference requires a considerable amount of self-awareness.

As a result of the above literature review, and as reviewed and summed by James and Blank (1993), the following relevant and significant learning style models and instruments have been identified under categories showing what each instrument measures:

Perceptual modality:

- Swass-Barbe Modality Index: measures preferences in sensory inputs i.e. visual, auditory or kinaesthetic.
- VARK model of learning styles (Fleming & Bonwell, 2006): assesses instructional preferences for receiving and giving information as either Visual, Aural, Read/Write or Kinaesthetic.

- Multi Modal Paired Associates Learning Test Revised (MMPALT II): measures preferences for seven sensory modalities.

Information processing ability:

- Kolb's Learning Style Inventory (KLSI): measures the 4 categories of learning styles which are accommodator, diverger, converger and assimilator, based on two dimensions of learning style which are based on the approach to a task (how they perceive information) and the consequence of the response to it (how they process information).
- The Index of Learning Styles (ILS) by Felder and Soloman (1991) measures learning style through 8 categories of styles to assess the learning styles preferences of learners on four dimensions. These dimensions are: active/reflective, sensing/intuitive, visual/verbal, and sequential/global.
- Schmeck, Ribich and Ramanaiah's Inventory by Schmeck, Ribich, and Ramanaiah (1977) of Learning Processes: measures behavioural process based on four dimensions which are deep processing, elaborative processing, fact processing and methodological study.

Personality factors:

- Honey and Mumford's Learning Styles Questionnaire by Honey and Mumford (1992): An adaptation from Kolb's 4 learning styles to the following four based on personality: activist, reflector, theorist, and pragmatist.

Combination instruments:

- Dunn & Dunn Learning Style Model (Dunn, 1984) measures an individual based on five categories of stimuli which are physiological elements (including perceptive elements), psychological, sociological, global vs

analytical processing style, and emotional elements. These categories are broken up into 21 to 23 elements that are measured.

For the purposes of this research, the Kolb's Learning Style Inventory 3 (KLSI 3) (see KLSI 3 in *Appendix C1* and *Learning Style Cycle & Grid* in *Appendix C2*) has been selected from all the studied instruments, as it has been widely used framework that appears most commonly in the literature that has been reviewed, and it was found to be most accessible and relevant to measure learning style within the context at hand, as this research looks mainly at measuring the information processing component of learning style, which is measured by the KLSI 3.

2.10.7 Using KLSI 3 as the basis of determining the dimensions of individual learning style:

According to Kolb (1984) and Kolb, Boyatzis, & Mainemalis (2001), it is suggested that individuals have particular strengths which form and develops their preferred `learning style'. An individual's learning style can thus be identified by assessing an individual's position on each of these two bipolar dimensions by using KLSI (Kolb, 2005). This is the method that will be used to measure and gauge what an individual's learning style is.

As stated by Kolb (2005), the KLSI is designed to measure the degree to which individuals display the different learning styles derived from experiential learning theory. The test is constructed in such a way that individuals respond to it as they would respond to a learning situation: it requires them to resolve the tensions between the abstract-concrete and active-reflective orientations. The KLSI thus requires individuals to rank order their preferences for the abstract, concrete, active, and reflective orientations.

The KLSI version 3 that will be used (see *Appendix C1*) consists of 12 items that asks respondents to rank four sentence endings that correspond to the four

learning modes, which are: Concrete Experience (experiencing), Reflective Observation (reflecting), Abstract Conceptualization (thinking), and Active Experimentation (doing). The inventory is intended for use by teens and adults who are above a certain level of maturity and education level, and not intended for use by younger children. The learning style of an individual varies as per an individual's five behaviour levels as developed by Kolb (2005), which can be seen in *Table 3:*

Table 3: The four learning styles in relation to five levels of behaviour (Kolb, 2005)

Behaviour Level	Diverging	Assimilating	Converging	Accommodating
Personality types	Introverted, Feeling	Introverted, Intuition	Extraverted, Thinking	Extraverted, Sensation
Educational Specialization	Arts, English, History, Psychology	Mathematics, Physical Science	Engineering, Medicine	Education, Communication, Nursing
Professional Career	Social Service Arts	Sciences, Research, Information	Engineering, Medicine, Technology	Sales, Social Service, Education
Current Jobs	Personal Jobs	Information Jobs	Technical Jobs	Executive Jobs
Adaptive Competencies	Valuing Skills	Thinking Skills	Decision Skills	Action Skills

As learning has been seen to be influenced by a variety of other factors, it is suggested that there may be more than two dimensions of learning styles and therefore more than four learning styles that people may display, which are not limited to the four behaviour levels. As per Kolb (2005), the LSI was thus created to fulfil the following two purposes:

- The first is to serve as an educational tool to increase an individual' understanding and self-awareness on the way they learn from experience and their unique individual approach to learning. By increasing self-

awareness of how they learn, the aim is to increase learners' capacity for cognitive control of their own learning process.

- The second is to provide a research tool for investigating experiential learning theory (ELT) and the characteristics of individual learning styles, which can contribute to the validity of interpretations of individual learning style scores. A research version of the instrument, including only the inventory to be scored by the researcher, is available for this purpose.

In explanation of his model on learning style, Kolb (1984) and Kolb (2005) described learning as a four-stage process that is made up of the following aspects that form the two sets of dimensions across which the learning styles are measured, as illustrated in *Figure 2*:

1. Concrete experience (CE),
2. Observation and reflection (RO),
3. Formation of abstract concepts and generalisations (AC), and
4. Testing of the implications of these concepts in new situations (AE).

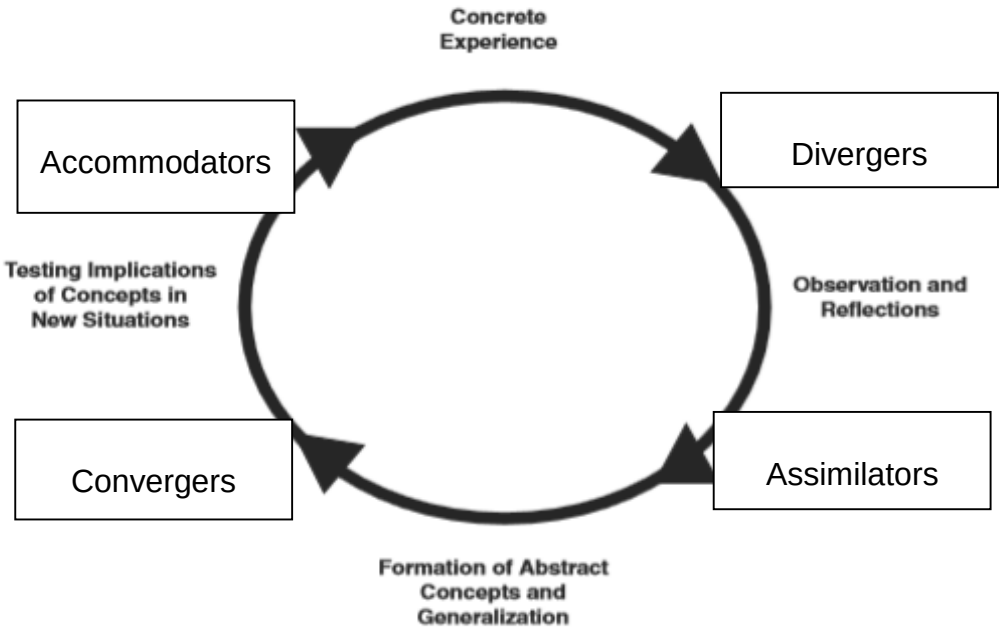


Figure 2: An illustration of Kolb's Learning Style Model (Kolb, 2005)

As per Kolb (1984) and Kolb (2005), it was explained that pairs of these activities form the two dimensions of learning style: These are CE versus AC, which is how individuals perceive information and AE versus RO, which is how they process and respond to information. This was developed by each pair being represented as polarities with a dialectical tension between each pair. The pairing is between concrete experience (CE) and abstract conceptualisation (AC) which forms the comprehension dimension, and between reflective observation (RO) and active experimentation (AE) which forms the transformation dimension of the model (Sadler-Smith, 2001). The four modes of experiential learning across the two learning style dimensions are (Kolb, 2005 and Kolb, 1984):

Concrete experience (CE):

This style emphasises feeling over thinking, understanding over complexity and that the uniqueness of the situation at hand is more significant than the theories and general concepts of it (Kolb, 1984 and Kolb, 2005).

Reflective observation (RO):

This style emphasises watching, spectating and observing over doing or acting, and observation and understanding over practical application of theory and concepts (Kolb, 1984 and Kolb, 2005).

Abstract conceptualisation (AC):

This style emphasises that thinking and cognition is more important than feeling and intuition, and that the development of general concepts and theories is more significant than intuitive understanding (Kolb, 1984 and Kolb, 2005).

Active experimentation (AE):

This style emphasises that action or doing is more imperative than watching and observing, and that applying knowledge in practice is more important than reflection or reflecting on experience and learnings (Kolb, 1984 and Kolb, 2005).

These four modes across the two dimensions can be summed into the following four learning style types as can be seen in *Figure 2* (Kolb, 2005):

Accommodators:

Individuals who are accommodators prefer concrete experience and active experimentation, as they prefer to act on problems and their strength is in execution or in getting things done. They are able to act quickly and take immediate action to adapt to changing and spontaneously arising situations and circumstances. They are problem solvers and act intuitively and through trial and error or experimentation (Kolb, 1984 and Kolb, Boyatzis & Mainemalis, 2001).

Divergers:

Individuals who are divergers prefer concrete experience and reflective observation, and their strong point lies in the fact that they are able to use their imagination and view situations in different ways. They have broad cultural interests and enjoy collaborative brainstorming and interaction. They have a good overview and are good at identifying strengths, weaknesses, opportunities and potential threats (SWOT), and are able to respond to these with ease (Kolb, 1984 and Kolb, Boyatzis & Mainemalis, 2001).

Assimilators:

Individuals who are assimilators prefer abstract conceptualisation and reflective observation by dealing with abstract ideas, theories and concepts, and assimilating them into a logical form. Their strength lies in developing theories or theoretical models and methodical reasoning through working with information

and analytical models, and thinking things through systematically and logically (Kolb, 1984 and Kolb, Boyatzis & Mainemalis, 2001).

Convergers:

Individuals who are convergers prefer abstract conceptualisation and active experimentation, and they are insightful in terms of practically applying the knowledge and experience that they gain and are good at putting theories and concepts into practice or in real terms. They prefer acting or doing than strategizing and planning. They are also effective at working with things and applications rather than with other individuals (Kolb, 1984 and Kolb, Boyatzis & Mainemalis, 2001).

2.10.8 Proposition 1

There are certain learning style dimensions that prominently arise and relate to effective workplace performance, from those categorized by Kolb's Experiential Learning Theory.

2.11 Workplace performance

The main problem of this research is to determine the nature of the relationship between learning style and self-perceived performance effectiveness in the workplace. Keeping this in mind, it is therefore important to understand the relevance of measuring work performance based on the performance of different sets of individual roles, tasks and functions that individuals engage in and are most probably be exposed to within the workplace. According to Shahabadi and Uplane (2015), Wang, Wang, Wang, and Huang (2006), Shaw (2012), learner performance is termed to be a 'multidimensional variable', and rightly so, as it has been shown to be affected by a variety of different factors, whether environmental, behavioural or content related. The same basis can be applied to workplace performance, as it may be affected in the same way if not in a more

complex manner by a variety of internal and external loci of factors within the contact of the workplace. Furthermore, the workplace uses performance outcomes to measure employee performance, and since the outcome-centric approach can be easily applicable across disciplines as shown in academia. It is used as the source for determining the performance effectiveness of employees across professions and disciplines in this study.

2.11.1 The association between work performance effectiveness and nature of work roles

Workplace performance relates to the nature of an individual's work role and task at hand, which is entails an individual's field or professional area of work, nature of the role and core responsibilities, and the nature of specific work tasks or competencies required to be performed (Kolb, 2005 and Kolb,1984). In light of this, it has been expressed by Read and Kleiner (1996) that in the same way as learning correlates positively with increased involvement and active participation in the learning activity and process by the learner as well as with positive reinforcement such as constructive and positive feedback, so does effectiveness of work performance correlate to the performance task at hand.

As per Hockings, Stolton, and Dudley (2000), the areas based on which workplace performance may be evaluated can be divided into three broad themes for a manager as per their nature. These are: design or planning which require analysis of the context before acting, adequacy or appropriateness which requires insight into the process, and quality of delivery of the tasks which requires foresight into the outcomes of execution (as outlined by *Figure 3).*

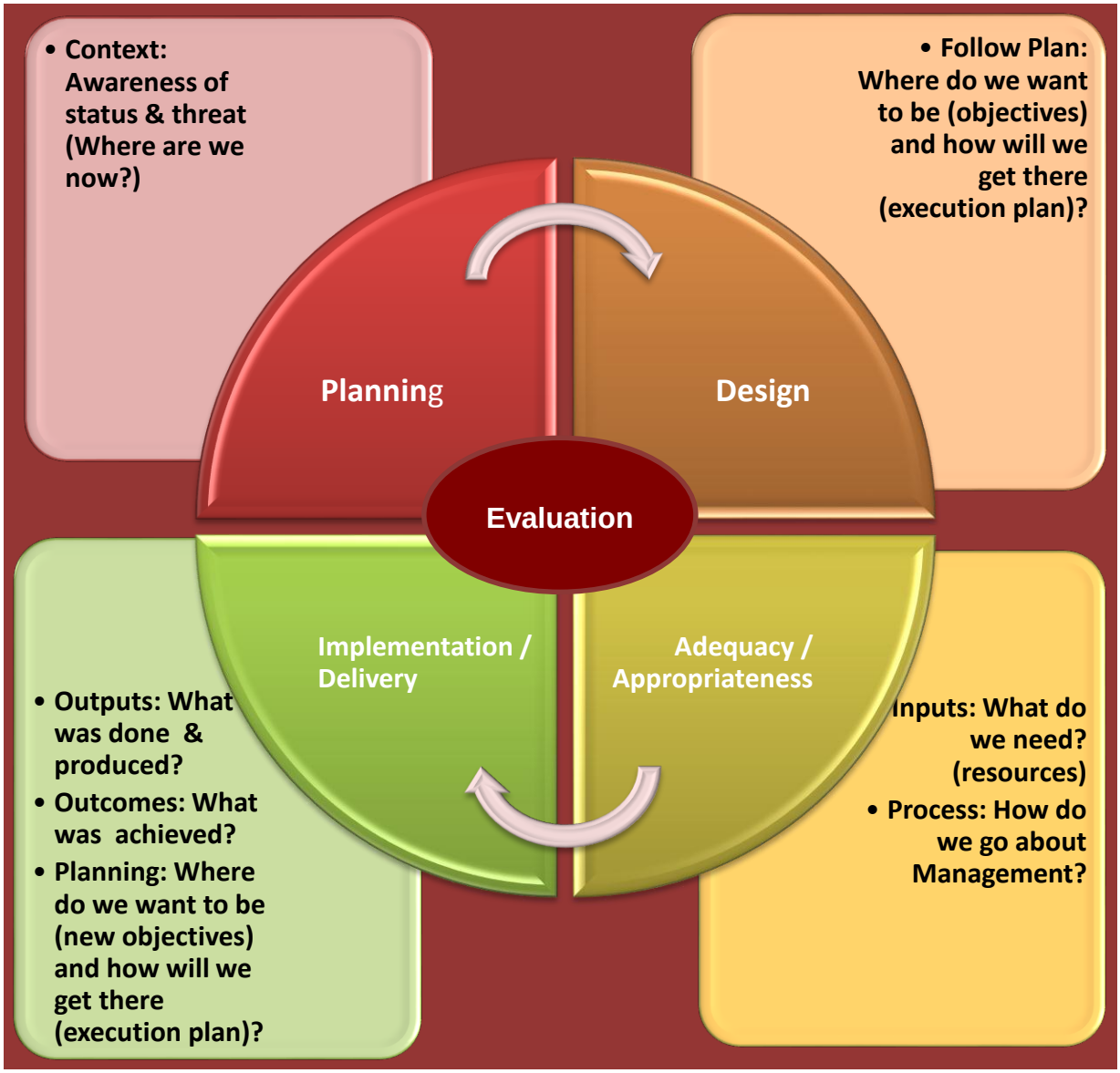


Figure 3: The broad areas for evaluating management effectiveness (Hockings, 2000)

The main competencies involved in the management process can be seen in *Figure 4:*



Figure 4: Competencies involved in the management cycle process (Hocking, 2000)

The relation of the competencies and tasks that individuals at middle management level and below have to perform such as dealing with problem solving and current trends in the market place requires current knowledge and thus improves the performance of employees, especially for managers who are expected to be most current, efficient and effective in performing their functional roles involving a series of analysis, research, solution development and

implementation by using recent and relevant frameworks and methodologies (Creplet, Dupouet, Kern, Mehmanpazir, & Munier, 2001). Thus, knowing and understanding the associations between factors and dimensions of learning styles and mapping their relations with effectively meeting performance objectives can contribute to strategic decision-making within divisions of an organization. This may relate to work task, operations and environmental design and dictate the appropriate use of technology and e-learning platforms, adequate resource allocation to tasks and work functions, and may even inform the building of the 'learning culture' and entrench the level at which work is performed in the organization.

2.12 Determining the association of learning style and learning effectiveness to workplace performance

It has already been established that determining an individual's learning style is significant. Its relevance can be demonstrated by the fact that it is influenced by the nature of work being performed and therefore it also holds true that learning style influences and affects the effectiveness with which roles and tasks are performed. The factors or criteria that will be assessed through the performance effectiveness questionnaire (see *Appendix B*), are based on the following broad areas of an individual's work performance requirements or demands that also shape an individual's learning style (Kolb, 2005 and Kolb, 1984):

2.12.1 Professional career:

A set of factors that shape learning styles stems from professional careers. An individual's professional career or their field of work exposes one to a specialized learning environment, but it also involves tackling generic professional problems such as being expected to use new information systems, working with new technologies, personnel conflict, and social service, all of which requires a

specialized adaptive orientation. Professional mentality, work ethics, values and beliefs on professional behaviours comprises an individual's professional orientation, which shapes their learning style. These are the habits that an individual acquires during their professional training and the immediate pressures involved in being a competent professional. In terms of professional field choice, the four learning styles are associated with the career fields as shown in *Table 4*:

Table 4: Learning styles and preferred career fields (Kolb, 1984)

Learning Style	Career Field
Divergers	Arts, history, political science, language, and psychology
Assimilators	Sciences, information or research and mathematics
Covergers	Technology-intensive fields such as medicine and engineering
Accommodators	Sales, social service, and education

2.12.2 Job role:

The factors influencing learning style includes a person's current job role. The task demands and pressures of a job shape a person's adaptive orientation. In terms of job roles, different management roles requires different learning styles as shown in *Table 5*:

Table 5: Learning styles and best fit job role (Kolb, 1984)

Learning Style	Job Role
Divergers	Personal jobs, such as counselling and personnel administration, which require the establishment of personal relationships and effective communication with other people
Assimilators	Information jobs, such as planning and research, which require data gathering and analysis, as well as conceptual modelling
Covergers	Technical jobs, such as bench engineering and production, require technical and problem-solving skills
Accommodators	Pro-activeness and an inclination towards accomplishing tasks and making decisions in spontaneous and uncertain circumstances

2.12.3 Personality type:

Personality type with the unique set of personality traits that an individual displays is an important factor shaping and influencing ones learning style. There are similarities in the constructs of learning style and personality, where the LSI and Myers-Briggs Type Indicator (MBTI) share correlations. It is shown that the extraversion/introversion dimension of personality correlates with the AE/RO dimension of Kolb's ELT (Kolb, 1984). Moreover, the feeling/thinking dimension correlates with the CE/AC dimension. In terms of learning styles and personality types, the accommodating learning style correlates to the sensing personality type. The assimilating learning style correlates to the intuitive personality type. Diverging learning styles are known to associate with feeling personality types and converging learning styles are known to associate with thinking personality types, where divergers are introverted feeling types and convergers are extraverted thinking types. The assimilators correlate to the introverted intuitive personality type and the accommodators are the extraverted sensing types (Kolb, 2005 and Myers, 1962). This correspondence between learning style and personality, as explained by Kolb's LSI and ELT from which it is derived (Kolb, 2005), can be seen demonstrated in *Figure 5*.

In support of this premise, however differently posed by Vasileva-Stojanovska et al. (2015), it was recognized to be agreeable with previous studies by Furnham (1992) and Jackson and Lawty-Jones (1996) who report that the 'thinking' type learning styles of Kolb's LSI (Kolb, 1976) amongst other learning style measures, correlate strongly to the personality dimensions of extraversion and psychoticism. An interjection to this idea is however shown where neuroticism demonstrated the opposite effect and did not show correlation with the learning styles and thus learning effectiveness. Other personality measures such as the Eysenck Personality Questionnaire (EPQ) (Eysenck, 1958) and MBTI (Myers, 1962) share correlations with Kolb's LSI showing that there are overlaps relating to the cognitive (thinking and intuition) dimensions (Jackson and Lawty-Jones, 1996

and Kolb, 2005). Bokhari (2011) also supports the idea that not all personality traits or types have a positive influence on learning effectiveness or effective work performance and perceptions thereof, as personality in addition affects attitude, sensitivity as well as self-esteem. Therefore, all personality dimensions will not show association to self-perceived performance effectiveness.

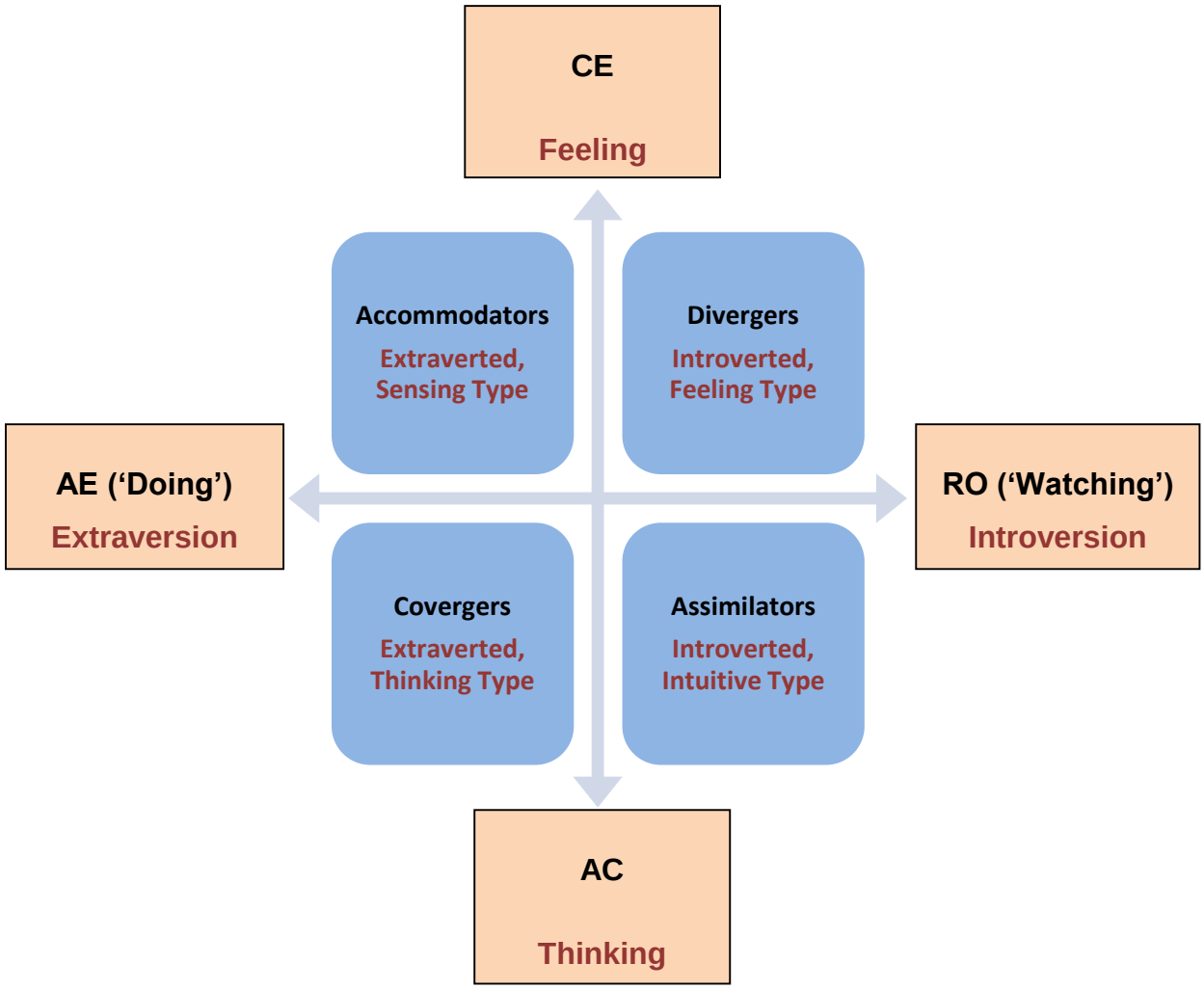


Figure 5: The correlation between learning style dimensions and personality dimensions (Kolb, 2005)

2.12.4 Adaptive competencies and work tasks:

The factors that shapes learning style includes the specific task or problem the person is currently working on. Each task that an individual is exposed to require a corresponding skills set for effective performance. The effective matching of task demands and personal skills results in an adaptive competence. The competencies and skills sets that match and complement particular learning styles are shown in *Table 6*:

Table 6: Learning style and complementary skills and competencies (Kolb, 1984)

Learning Style	Skills and Competencies
Divergers	Valuing skills: Relationship, Helping Others, and Sense Making
Assimilators	Thinking skills: Information Gathering, Information Analysis, and Theory Building
Covergers	Decision skills: Quantitative Analysis, Use of Technology, and Goal Setting
Accommodators	Acting skills: Leadership, Initiative, and Action

It was also explained that an individual's learning style is influenced by the individual's preference to learn in a certain way by which they can concentrate, absorb and remember information and skills more as opposed to through other means, which made it easier for learners to perceive and interpret information (Dunn, 1984 and Kolb, 1984). Kolb (1984) therefore categorized learning styles onto two different dimensions as per the different individual inherent learning approaches of learners. Kolb is the most cited author followed by Dunn and Freedman in literature on studies on learning style (Desmedt & Valcke, 2004), and therefore the Kolb's Learning Style Model and Instrument will be delved into further.

In their study, Miller and Archer (2010) showed the importance of work-based assessment or the assessment of daily work practices in a work environment, and its impact on the performance of medical practitioners. It was explained that many different workplace-based assessments exist that are designed to assess

different areas of work performance which were categorized. These assessment categories through which performance evaluation was conducted can be interpreted and stated as evaluation and procedural skills, case-based or project discussions, and feedback from peers, co-workers or service recipients. However, for the purposes of this research, it is the individual themselves who will provide this information based on their own assessment and perceptions of their own performance.

As learnt from Kolb's Experiential Learning Theory (ELT) (Kolb, 1984), and as supported by theory on adult learning (Dinmore, 1997), and informal learning that adults in the workplace engage in (Dinmore, 1997), experience based learning on a day to day basis is how adults at work mainly learn. In line with this, Gerber (1998) formulated eleven different ways or criteria that individuals at work learn through, which are involved through the performance of their work roles and tasks. These different ways, their description as well as the associated learning styles are listed in *Table 7* (Buch & Bartley, 2002; Gerber, 1998; and Svinicki & Dixon, 1987).

Table 7: Eleven ways or performance criteria that informs individual learning (Buch & Bartley, 2002; Gerber, 1998; and Svinicki & Dixon, 1987).

Performance criteria	Description	Associated Learning Styles
Learning not to repeat previous mistakes and misjudgements	The act of learning from the tasks that were previously not performed correctly and not repeating those mistakes when encountering a similar situation.	Accommodators, Divergers, Assimilators
Self-education at work and out of work for self-awareness and development	The act of taking an interest in your own growth and development and initiating learning for yourself through observation of actions and behaviours.	Accommodators, Divergers and Assimilators
Practicing personal values and beliefs or authentic leadership	The act of making decisions ethically and influencing others by practicing your own values and beliefs such as honesty, transparency, loyalty, and integrity.	Accommodators, Convergers, Divergers

Performance criteria	Description	Associated Learning Styles
Applying theory and practicing skills for effective performance delivery	The act of applying or transforming your training and knowledge of concepts in performing practical work situations.	Accommodators, Convergers, Divergers
Problem solving skills and insight into processes (inputs and context)	The act of approaching, tacking and solving problems, conflicts and difficult situations in the workplace.	Accommodators and Divergers
Engaging in collaboration and interaction	The act of interacting and communicating with an expert.	Convergers, Divergers and Assimilators
	Personal coaching and mentoring in the workplace.	Divergers and Assimilators
Open lateral planning and overview	The act of using your instinct, intuition, imagination and networking skills to plan ahead and foresee outputs and possible outcomes.	Accommodators and Divergers
Being an advocate for colleagues	The act of motivating, supporting, and encouraging the ideas, feelings or actions of fellow colleagues.	Accommodators and Convergers
Offering leadership to others	The act of leading individuals or teams of individuals in the workplace.	Accommodators, Convergers and Divergers
Engaging in formal training methods	The act of participating in formalized learning methods as part of workplace training programs which include:	Accommodators and Divergers
	Audiotape material Computer based work and training	Accommodators, Convergers and Divergers
	Videotape material	Accommodators and Divergers
	Presentation slides	Accommodators, Convergers, Divergers, and Assimilators
	Reading newspapers and journals	Accommodators, Convergers, Divergers, and Assimilators
	Lectures type interactions	Convergers and Assimilators
Practicing quality assurance, continuous improvement and double checking	The act of engaging in continuous professional development (CPD's), checking performance outputs,	Divergers and Assimilators

Performance criteria	Description	Associated Learning Styles
	measuring performance outcomes, receiving feedback, and improving performance behaviours.	

As has been outlined and discussed in this section, there are several sets of factors that have been said to influence the effectiveness level of individual work performance through learning, however, in order to effectively measure the effectiveness of an individual's work performance in relation to their learning style, the most appropriate and inclusive set of factors need to be measured (Kolb, 1984; Svinicki & Dixon, 1987). In reality and view of all the various paradigms reviewed in the literature, work performance can only be fully effective if all the areas and different types of factors that affect work performance are optimized.

This research study thus aims to understand the nature and levels of association that learning style preferences have with the above experiential learning-based performance factors.

2.12.5 Proposition 2

There are associations between individual learning style dimensions and the self-perceived effectiveness of individual work performance.

2.13 Conclusion of Literature Review

In an ever changing business environment and a constant need to learn and adapt to this change, the association between factors that affect the way in which employees learn at their best, their learning styles, and the factors that affect workplace learning and performance in accomplishing work tasks and functions is important to determine. This is because learning style characteristics of employees contribute to their ability to absorb and retain new and challenging information and in accomplishing work tasks. As there are many strands of individual learning styles that show similarities, awareness to such knowledge

can be harnessed for the development of effective learning strategies that optimize workplace performance (Dunn, 1984).

It has already been established above from the research literature reviewed, most significantly by Kolb (1984), Kolb (2005), Dunn (1984), Boyle (2012), Cassidy (2004) and Dunn & Dunn (1993) that the effectiveness by which people learn or the way they receive, retain and apply knowledge best is affected by their individual learning style. Learning style has also been shown to affect the means or best-fit learning methods through which an individual learns best or prefers to learn (Dunn, 1984, Hayes & Allinson, 1994, Sadler-Smith, 2001, Boyle, 2012, and Ayersman, 1996, Smith, 2003, Chou & Wang, 2000).

Furthermore, Davidson (2002), Dunn (1984) and Kolb (1984) all show that learning style does correlate with what needs to be learnt and affects student's performance. Therefore, despite the nature of learning as well as performance in the workplace being fundamentally different than that at educational institutions, it can be implied that individual learning style affects the ways and effectiveness with which individuals learn at work. This premise in turn affects the effectiveness of an individual's work performance, as both have also been shown to relate to the nature of the work task that needs to be performed (Kolb, 2005). It is therefore implied that learning style and the effectiveness of how people learn affects the effectiveness of an individual's work performance or in other words the ease, independence and quality with which they perform their roles and work tasks.

The aim of this research is not to label or 'pigeon-hole' employees according to the way they learn best, but to rather interpret the associations between their own learning styles and through the nature of associations between individuals learning styles and self-perceptions of individuals workplace performance, determine the associations that can foster and hinder their learning and effectiveness of their work performance. This can then be used to inform strategic decision-making by managers on how to allocate tasks, develop functional roles and create a suitable learning environment where individuals can accomplish

their work more effectively. Thus, project implementation, strategy execution methods, work environment architecture, work flow operations and task design can all be aligned to both the organizational learning culture as well as to the learning style preferences and effectiveness of work performance of middle managers as well as all employees in the workplace.

2.13.1 Proposition 1:

There are certain learning style dimensions that prominently arise in the workplace from those categorized by Kolb's Experiential Learning Theory.

2.13.2 Proposition 2:

There are associations between individual learning style dimensions and the self-perceived effectiveness of individual work performance.

3 CHAPTER 3. RESEARCH METHODOLOGY

The research propositions that have been developed in the literature review in chapter 2 are possible statements that were proposed to explain the nature of the association between individual learning style and effective performance in the workplace. These provisional statements were tested by obtaining actual data from South African organizations. The collection and analysis of this data was conducted by selecting and applying an appropriate methodology that demonstrates both validity and reliability in its approach in assessing, analysing and drawing conclusive data, in order to easily interpret and form valid and reliable conclusions. This chapter will elaborate on the research methodology that was adopted for the collection, analysis and interpretation of the data for this research study.

3.1 Research methodology / paradigm

This research employed a quantitative method of data collection and analysis, which primarily used a post positivist approach for developing and responding to the research propositions (Creswell, 2013).

1. An adaptation of the Kolb's Learning Style Inventory Version 3 (KLSI 3) was used to ask the relevant questions affecting an individual's learning style (Kolb, 2005).
2. A list of questions were developed from the literature in order to assess the self-perceived effectiveness of an individual's work performance (Buch & Bartley, 2002, Boyle, 2012, Gerber, 1998).

The method of analysis for the data that was obtained from each part of the questionnaire was analysed and interpreted using inter-battery factor analysis, which is based on an exploratory technique of factor analysis (Tucker, 1958, Stacey, 2015). An automated model programme using Microsoft Excel gave a set

of factor loadings and categories that were generated for the data in order to determine the communalities or common concepts that arise from the two data sets, in order to establish the nature of the association between the factors on learning style and the factors on work effectiveness.

3.2 Research Design

The research design with the use of a quantitative methodology focused on a cross sectional design which looked at a structured observation that used a survey format with closed ended questions presented with multiple options. This was performed on a sample of selected individuals at a single point in time.

The methodological approach that was adopted for the collection of data was chosen to be a survey/questionnaire format, through which respondents were asked to answer a three-part online questionnaire (see *Appendix B*) to gain ordinal data. It was the quickest and most convenient means of obtaining the two sets of ordinal data required to assess employee learning style preferences and self-perceived work performance effectiveness. This process relied on the respondent's commitment to answering the survey, as it was sent to the respondents electronically and was needed to be answered as soon as possible after being distributed.

The data collected was then analysed using pre-determined instruments that yielded statistical data that was then analysed and interpreted to draw conclusions on the nature of any possible associations or relationships.

3.3 Population and sample

3.3.1 Population and sample frame

The research population of this study consisted of employees within different South African organizations in Johannesburg. These organizations range across industries and professional designations, including finance, law, healthcare, engineering, accountancy, sciences, and management consultancy. The population included employees of top and middle management level as well as non-managerial employees of these organizations who had at least a matric qualification.

From this defined population, the research survey was sent to a total of 767 individuals who constituted the sample frame of the study. Out of the 767 individuals who were invited to participate in the research study and to whom I had reasonable access, 143 individuals actually participated in the survey.

3.3.2 Sample and sampling method

This sample or number of employees who actually participated were 143 individuals. The actual sample used for the analysis of data was reduced to 130 out of the total number of 143 respondents as these respondents fully completed the survey. The names, identities as well as the individual responses of research respondents were handled and maintained with discretion and confidentiality. Below in *Table 8* are the types of respondents surveyed:

Table 8: Table of respondents

Description of respondent type	Number sampled
Managerial Employees	65
Non-Managerial Employees	65
Total sample size	**130**

The number of complete responses were deemed to be a sufficient number of people as required for the research sample size, and which also complied to the time and cost constraints for completion of this study. In addition, the sample frame was selected in order to have employees of both managerial or non-managerial work functions and educational qualifications that meet the minimum requirements of a matric qualification. Therefore, the sample consisted of a group of individuals who were selected as a *convenience sample with self-selection.*

The research sample is found to be fairly heterogeneous in profile, having both genders of balanced proportion, a mixed prevalence in age and race, with varying qualification levels. The survey was thus conducted on individuals who are either managers or non-managers in different areas of expertise, educational qualifications, race and gender. This is relevant in Kolb's ELT as learning styles have been shown to correlate with career or profession and work roles (Kolb, 1984), correlate to field of study or education (Kolb, 1984), differ for males and females (Hassan et al., 2012), and may differ for different races as learning styles have not shown to differ directly based on race, but does differ based on cultural factors such as language, socio-cultural tightness, socio-environmental factors and ecological adaptation that are all influenced by ones racial background.

The total minimum number of respondents that were required to be surveyed out of the research population is 100 employees, as it is forwarded by Gorsuch (1983) that a study of less than 100 respondents should not be conducted in order to maintain reliability. It is forwarded that there should be at least 5 individuals per variable and at least 100 individuals for the analysis. Hair, Black, Babin, Anderson, and Tatham (2005) also advice that the number of factors used should be 10 times the number of factors being analysed for conducting a valid study. Therefore, a minimum of 100 respondents for the purposes of this research study were used as it is a large enough sample taking into account the time constraints at play, to obtain a sufficient quantity of data to allow for the analysis of the data set obtained to be both valid and reliable.

3.4 The research instrument

The research instrument that was used for the first section of the survey is based on the Kolb's LSI 3 which is a derivation of his work on Experiential Learning Theory (ELT) (Kolb, 2005, Kolb, 1984). The adapted questionnaire that has been developed for the purposes of this research uses the ways in which individuals learn from the categories or learning styles developed by Kolb as a bases. A 7 point Likert Scale will be used to determine individuals learning style preferences based on twenty-four types of learning activities derived from the KLSI 3 (Kolb, 2005).

The second section asks a range of questions based on the respondent's individual work performance using a 7 point Likert scale to rate the effectiveness of the respondent against the work performance criteria given.

The use of a seven point Likert scale was tested through a pilot study on 6 people in order to establish the ease with which they can complete it. All 6 of the respondents from the pilot study did not have difficulty in answering the questions using a 7 point Likert scale, thus this was retained. Rather, it was recommended that the length of the questions be shortened, the performance effectiveness criteria be made more to the point and that the length of the survey in terms of redundant questions be reduced. Therefore, for the sake of reducing redundancy, length and the time consumed to complete the survey, all of the requests were fulfilled as best possible without reducing the integrity of the questions and the survey.

3.5 Procedure for data collection

In order to obtain the relevant data on both individual learning style and self-perceived work performance effectiveness, the respondents were required to complete three-part questionnaire (see in *Appendix B*). The questionnaire was electronically sent out to a population to obtain a minimum of 100 respondents.

143 employees responded, out of which 130 completed the survey. The survey was expected to be submitted as soon as possible i.e. at most within 5 days of being sent, after which the data was analysed and interpreted. The parts of the questionnaire are explained as follows:

The *first part* of the questionnaire asked the respondent on general demographic data, maintaining confidentiality of the respondent.

The *second part* of the questionnaire evaluated the learning style preferences of the respondent through the learning style assessment questionnaire, which is based on the learning activities of KLSI Version 3 (Kolb, 2005).

This original instrument (KLSI 3), on which the learning style assessment is based, uses a forced-choice format that ranks an individuals preferred learning style elements by using a 4 point Likert scale, which ranks individual learning style preferences on independent dimensions. The individual completes 12 sentences that describe elements relating to their learning, and the individual will be asked to rank the endings for each sentence according to what they prefer or what suites them best. The 4 point Likert scale can be interpreted as follows: '1 = most like you', '4= least like you' (Kolb, 2005). The four scores measure an individual's learning preferences on four learning modes. I.e. AC, CE, AE, and RO. An individual's position on the two learning style dimensional model (AC-CE and AE-RO) will determine what learning style preference the individual has. This is obtained by the individual being plotted against a standardized grid (Kolb, 1999).

The instrument used for the purposes of this research used the sentence endings from the KLSI 3 as individual factors in order to determine the dimensions of learning styles that exist, using a 7 point Likert scale (i.e. those developed by Kolb and whether there are other associations and dimensions that exist).

The *third and final part* of the questionnaire assessed the self-perceived work performance effectiveness of an individual in relation to their learning style by

asking the respondent questions on how well they feel they perform their work tasks.

The assessment of each individual's learning-based work performance factors or criteria were held contingent on the following question: "How effective are you at doing the following in your daily work or how effective are you at this work area or performance task/criteria in your workplace?".

Respondents were required to rank their performance on each performance criteria in relation to this question involving their own learning style. An ordinal scale (7 point Likert scale) was used where 1 = least effective performance and 7 = most effective performance.

After the data collection procedure was completed, the data sets were interpreted using the appropriate data analysis methods and techniques as discussed in the next section.

3.6 Data analysis and interpretation

The way in which each part of the questionnaire was viewed, analysed and interpreted is explained below:

3.6.1 The Independent variable is Learning Style:

For the data analysis, the inter-battery factor analysis method was used to assess the associations between learning style and self-perceived work performance effectiveness.

According to Kolb (2005), there are two primary learning style dimensions that were obtained from data set one. Through his perspective, this is accomplished firstly, by the difference in the scores of the CE scale and the AC scale to create the AC-CE scale, and secondly, by the difference in the scores of the RO scale and the AE scale to create the AE-RO scale. This is due to the fact that Kolb

(2005) views thinking and feeling as opposite constructs as well as doing and reflecting as opposite constructs. Through this research, this theory was tested and the possibility of there being other underlying dimensions to learning styles within the workplace were explored.

For the data interpretation, the data obtained was compared to the existing two dimensions of learning styles suggested by Kolb (2005), which act as the independent variables of the research, in order to determine whether there are other associations that exist, which would lead to the development of new dimensions of viewing an individual's learning style.

3.6.2 The dependent variable is the self-perception of work performance effectiveness:

The dependent variable or variable of the research that depends on the respondents learning style is the effectiveness of the respondents work performance. This was measured by using a 7 point Likert scale in the performance effectiveness questionnaire.

3.6.3 Using Inter-battery Factor Analysis as the method for data analysis:

Once each part of the questionnaire was answered, the associations between the two sets of factors were analysed by using Inter-battery factor analysis, which is a method or technique of analysis that identifies the factors between two sets (or batteries) of data that are common, in order to reveal the underlying dimensions that may be shared or that correlate showing the associations (Tucker, 1958).

As explained by Gorsuch (1983) and Stacey (2015), Exploratory Factor Analysis (EFA) is the basis of this technique of analysis, as it uses ordinal data, which is the simplest form of data, in order to obtain two sets of data (X and Y) to analyse for communalities (F) in the two sets of factors (as shown in *Figure 7*). It is thus a technique that identifies and determines the interdependence or associations

between independent data sets or independent variables. An illustrative figure of Exploratory Factor Analysis is shown below in *Figure 6* (Stacey, 2015):

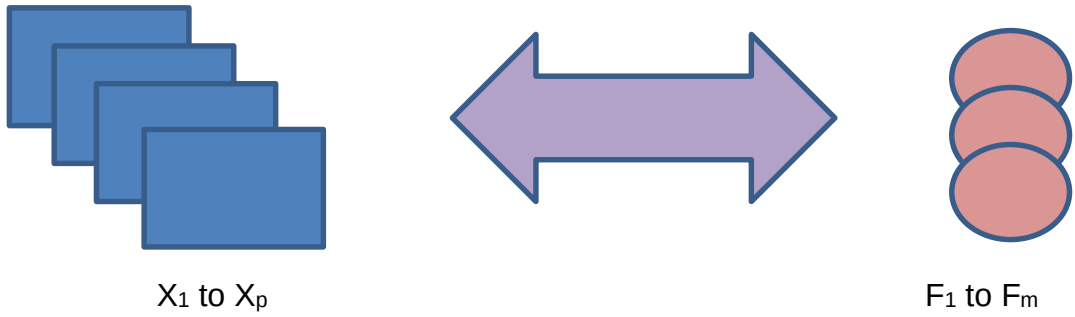
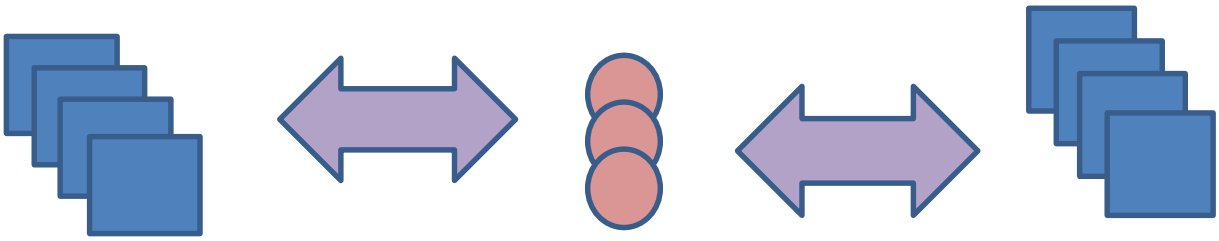


Figure 6: Graphical representation of Exploratory Factor Analysis (Stacey, 2015, p 29)

It is explained by Gorsuch (1983) that the higher the communalities, the unique factor weights that are obtained are lower and there is lower chance correlation, thus increasing replicability of factors, and increasing stability of the study. The factor loading structures are used to analyse the associations between the two ordinal data sets. The correlation between factors are shown by scores that are obtained in the two batteries of tests conducted. These scores are the factor reliability coefficients as explained by Tucker (1958). The inter-correlations between each of the two data sets are used to obtain the factor reliability coefficients. The meanings of a low factor reliability coefficients reflect components of non-equivalent transformations of the factor matrices, whereas, high factor reliability coefficients represent greater stability and reliability of the factors determined from the two batteries of tests (Tucker, 1958).

Furthermore, the inter-battery method of factor analysis depends on finding reference factors (F) for the two batteries (the two data sets, X and Y) from the matrix of correlations between the two data sets. It is only the factors common to the two batteries of data and not the factors that are in only one of the two batteries that are determined and are of interest, as this is the resultant data that

is representative of the research question. The factors common to two batteries of tests have to be correlated when such tests are administered to one sample of individuals (Stacey, 2015). The concept of the Inter-battery method of Factor Analysis is illustrated below in *Figure 7* (Stacey, 2015).



X_1 to X_p F_1 to F_m Y_1 to Y_q

Figure 7: Graphical representation of Inter-battery Factor Analysis (Stacey, 2015, p 9)

The use of the inter-battery method of factor analysis as has been represented thus shows that it is an appropriate method to use when attempting to determine commonalities between two sets of data relating to human behaviour or human performance, thus eliminating the controversial aspects of the estimation of communalities (Tucker, 1958). For the graphic representation of the multivariate data sets in a low dimensional space as an extension of the inter-battery method of factor analysis is shown by Stacey (2015). Thus, when applying co-inertia mapping the researcher needs to be attentive to the possible emergence of insignificant and unimportant factors from possible false correlations (Stacey, 2015 and Tucker, 1958).

What is expected from the data analysis is a single factor structure that defines a set of axes that can be used to position the variables from both datasets and the observations. Therefore, co-inertia mapping is a graphical representation of the resulting paired datasets in low dimensional space (Stacey, 2015). The method that was used for determining the number of associative factors to retain is the Parallel Analysis (PA) method (Hayton, Allen, & Scarpello, 2004).

From a practical viewpoint, if one variable is relatively uncorrelated with other variables, it is eliminated in a common factor analysis. The principal components are analysed as the underlying dimensions that are retained. Rotation of axes were carried out for each of the two batteries or sets of data. The method of rotation applied in this study was the Varimax Rotation. Many rotation techniques exist to simplify the interpretation of the underlying structure by reducing the number of the evident variables defining each latent dimension and to maximize the variance of the squared factor loadings.

3.7 Limitations of the study

The validity and reliability of this research study would have been weakened on the following basis (Tucker, 1958):

- The sample size not being representative of the study, as a series of statistical tests are performed as per the sample size in the estimation of communalities, which yields an indication of whether more factors than those determined are justified.
- The technique chosen not being suitable for the type of data sets (ordinal data) being used and if the technique of data analysis did not complement the nature of the research questions or the main problem of the research itself.
- There is no satisfactory method for transformation of the matrices, and there being slight differences in the comparability of the rotation of axes for the batteries by lack of symmetry.
- The statistical significance of the results being invalid when compared to results from a random sample of unrelated measures.
- The statistical test is a minimum test, and does not mean that that there are not more factors to be considered.
- The stability of the factors being affected if there are changes in the battery of tests being analysed, making it difficult to identify.

- There being unreliability in the regression weightings used for the prediction of observed scores and therefore factor correlations.
- There being an inaccuracy in the computation of the chi-square approximation which affects the theoretical distribution for the correlation coefficients, and in the factor loadings which is what determines the significance of the factors.
- The approximate significance test for the minimum number of factors determinable not being accurately conducted, as there is no rigorous mathematical basis supporting this test.
- Consideration of whether coefficients are low for the factors depending on further experience and insight of their characteristics and purpose.

3.8 Validity and reliability

3.8.1 External validity

As explained by Tucker (1958), the central purpose of factor analysis, as the method of data analysis, is important and using a valid method of analysis where the abilities represented by the weights for a particular test or battery must remain the same even when it is changed from one type of test or battery to another, but which involves the same common factors. Thus, the actual concepts or constructs being measured were the same or remained truthful even when peripheral parameters were modified or altered, thus maximizing generalizability outside of the research context assumed for the purposes of this research study. Therefore, in inter-battery factor analysis, in order to quantify the problem of factor stability over changes in a test battery, a factor reliability coefficient is proposed (Tucker, 1958).

The scale that was used to obtain the ordinal data for part 1 and 2 of the questionnaire is important in validating the research, as the Likert scale being used must be used correctly to ensure validity as a research instrument that measures ordinal data. In relation to the data analysis method using an

exploratory factor analysis technique, statistical validity may be threatened by the use of an ordinal data set, as the data may not meet the postulated assumptions and at worst this method could assume and interval scale (Gorsuche, 1983). It is also forwarded by Gorsuche (1983) that a common factor model results in a greater number of replicable factors than a component model would if the communalities are small. In addition to this, the larger the number of variables used, most likely greater than thirty, then the less dependent the results would be on the method of analysis and replicability should be assured.

The external validity of the KLSI 3 on which the learning style assessment in part 1 of *Appendix B* is based is explained by Kolb (2005). The external validity of KLSI 3 includes evidence on the generalizability of the population based on demographic factors such as age, gender, educational level, and educational specialization, together with concurrent validity with other experiential learning assessment tools, aptitude test measures, academic performance, different contexts of workplace performance, experiential learning in diverse teams, and educational applications (Kolb, 2005).

In this study, the use of a relatively small sample size and specificity of the population limits external validity in terms of population, ecological, temporal, and possible research bias, as a wider population is not being used. This limits the randomness of the sample and the impact of other influential factors on learning style could skew results (Onwuegbuzie, 2000).

Age: Previous research with the KLSI 1 showed that preference for learning by abstraction increased with age, as measured by the AC-CE scale. Preference for learning by action showed an initial increase (up to middle age) and a subsequent decrease in later life, as measured by the AE-RO scale. Results from the KLSI 3.1 normative sample show similar relationships between the combination scores and six age ranges- <19, 19-24, 25-34, 35-44, 45-54, >55 (Kolb, 2005).

Gender: Previous research with the KLSI 1 and KLSI 2 normative groups showed that males were more abstract than females on the AC-CE scale and that there were no significant gender differences on the AE-RO dimension. Results from the KLSI 3.1 show similar gender differences on AC-CE. Results need to be interpreted carefully, as educational specialization and career choices interact with gender differences, making it challenging to sort out how much variance in LSI scores can be attributed to gender alone and how much is a function of one's educational background and career (Kolb, 2005).

As stated by Kolb (2005), research relating educational level to learning style in the LSI 1 normative sample showed the predicted linear relationship between amount of education and abstractness. Data from the KLSI 3.1 normative sample show the same linear relationship between abstractness and level of education- from elementary to high school to university to graduate degree.

Educational Specialization: KLSI shows that student learning style distributions differ significantly by academic fields and that learning styles may be influenced by environmental demands and thus results obtained for professionals and students in a specified discipline may be dissimilar (Kolb, 2005).

3.8.2 Internal validity

Internal validity will be ensured as the sampling error is almost entirely removed from the input data as the selected sample perfectly represents the research intent. The internal validity studies of the structure of the KLSI 3 on which part 1 of *Appendix B* is assessed, using factor analysis have been shown, as predictions can be made from ELT about the relationship among the scales of the LSI. Correlation studies of the LSI scales indicate that the four modes of learning (CE, RO, AC, and AE) are composed of two dimensions. Kolb (2005) identifies 17 published studies that used factor analysis to study the internal structure of the KLSI. Most of these studies have focused on the LSI 2, however, data shows consistency with previous versions of the KLSI and gives qualified support for the

ELT basis for the inventories that have been used. Overall the results of correlation and factor analysis studies show similar results. Internal validity has also been taken into account in the formulation of the questionnaire, where demographical data has been asked for to be aware of the possible effects of other factors as stated in the research, however, the questions to be asked have been formulated to acutely focus on the independent variable and dependent variables as opposed to the impact of other variables (Onwuegbuzie, 2000).

3.8.3 Reliability

For determining reliable data, “significance tests for the minimum number of factors determinable from any given large sample data has been developed for the inter-battery method. While this test seems reasonable on intuitive, logical, and geometrical grounds, a completely rigorous mathematical development of this test, or any variant of it, has not been found” (Tucker, 1958, p122).

The correlation strength between the ordinal data or the variables affects the reliability of the research study, as Hair *et al*. (2005) explains that the statistical significance of the factor loadings is important to consider in relation to the sample size being used. The minimally acceptable has been said to be approximately thirty to forty factor loadings for reliability and significance. Factor Analysis error or the error produced by the method directly affects the reliability of the research results, therefore a ‘control’ factor analysis on the data iterations is used to test the reliability of the instrument across iterations and samples.

The use of tests in the first and second battery that have a low reliability, lowers the factor reliability coefficients, which indicates that the tests have low communalities, and therefore the factor reliability coefficients will be low. This shows that there is a large extent of error variances and large specific factor (Tucker, 1958).

The results of ELT and KLSI 3.1 scales Kolb (2005), show good internal consistency reliability across a number of different populations. Re-test reliability studies of the randomized format KLSI 3.1 have been published. When the LSI was conducted three times at 8-week intervals to initial and replication groups of business employees and students, test-retest correlations were found, with correlations well above 0.9 in all cases. This indicates that very few students changed their learning style type from the prior administration to the next one. Changes in style may be the result of experiences between test and retest as well as the individuals' ability to adapt their style to changing environmental demands. Internal consistency reliability is shown by the results of seven different studies of the randomized KLSI 3.1 where the order of the items in the inventory were randomized. The results suggest that the KLSI 3.1 scales show good internal consistency reliability across a number of different populations (Mainemelis, Boyatzis, and Kolb, 2002 and Kolb, 2005).

3.9 Demographic profile of respondents

The demographic profile of the actual sample used (fully completed surveys) out of the total number of respondents (completed and incomplete surveys) was 130 responses out of total of 143 responses. The demographic profile of this sample consists of 7 factors which are to age, gender, qualification level, type of industry, profession, work position, and work experience which can be seen graphically illustrated below:

3.9.1 Demographic profile relating to Age:

Most of the respondents (44%) were between the ages of 30 and 39, followed by 38% of the total being between the ages of 18 and 29 years. This was expected, as young or middle aged adults and above were required for this study.

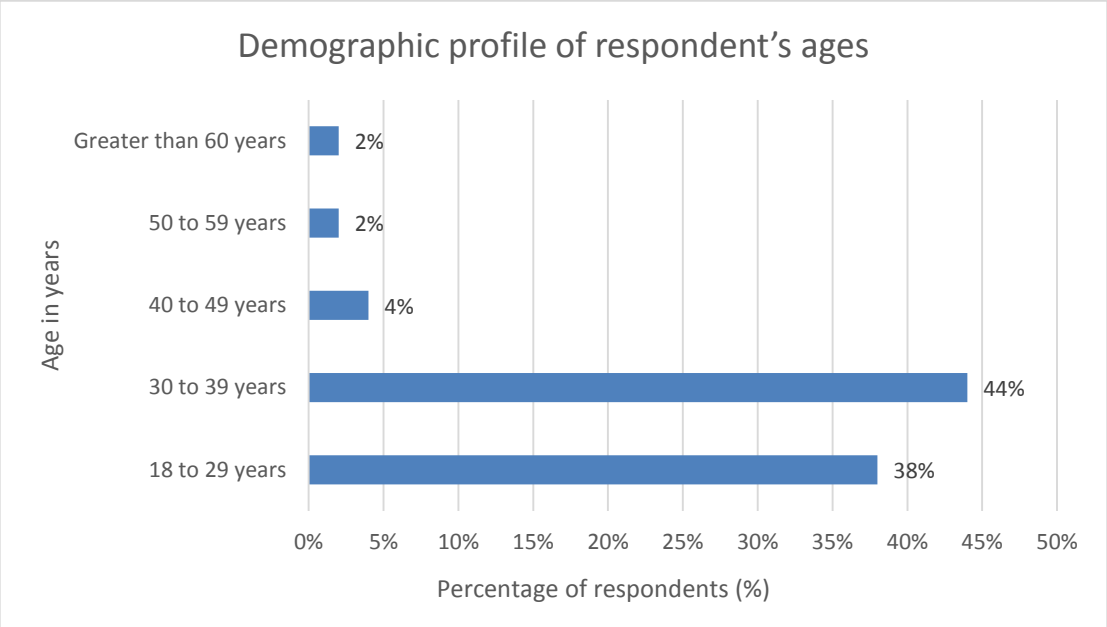


Figure 8: Bar graph representing respondent's ages

3.9.2 Demographic profile relating to Gender:

More than half (52%) of the respondents were of female gender. However, this was not significantly larger in proportion to the male proportion of respondents, which is a good indicator as any major gender effects or possible skewing of the data could be balanced.

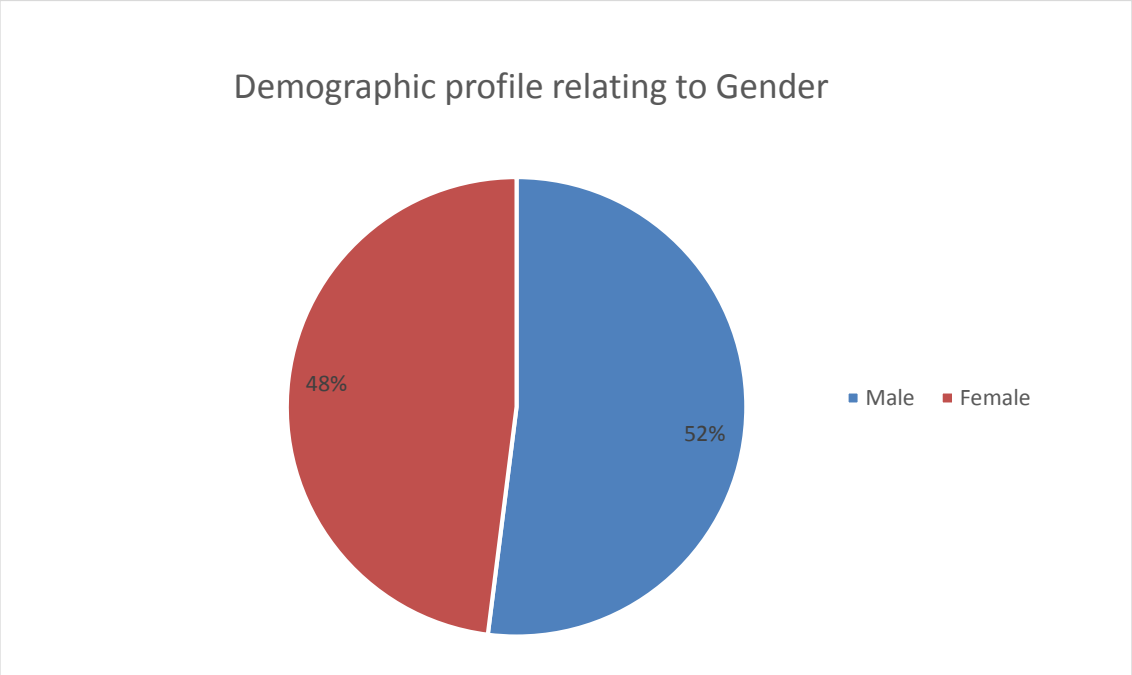


Figure 9: Pie chart representing respondent's gender

3.9.3 Demographic profile relating to Qualification Level:

The sample surveyed showed a high qualification level, where 32%, 28% and 28% achieved Honours, Bachelors and Masters Degrees respectively.

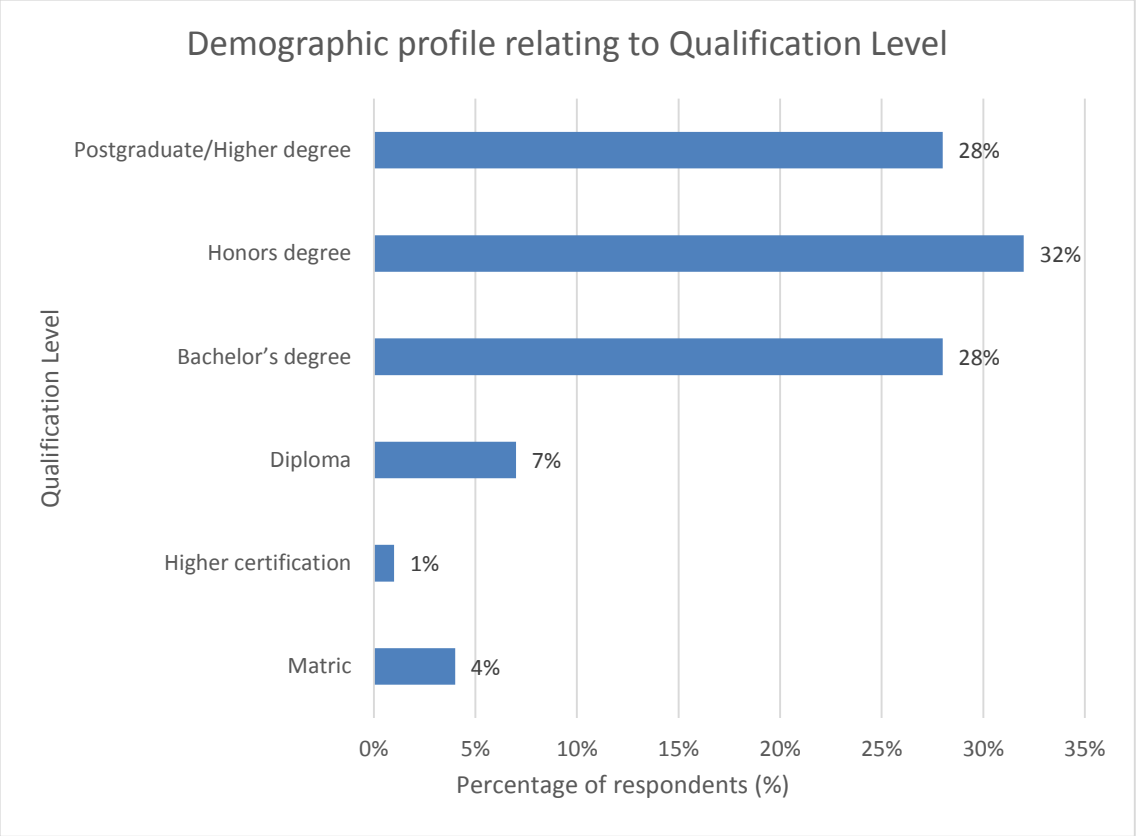


Figure 10: Bar graph representing respondent's qualification levels

3.9.4 Demographic profile relating Type of Industry:

The demographic profile of employees in terms of the types of industries from which they come was diverse, which was expected and needed for this study which focused on the general corporate work context, in order to eliminate any industry specific effects.

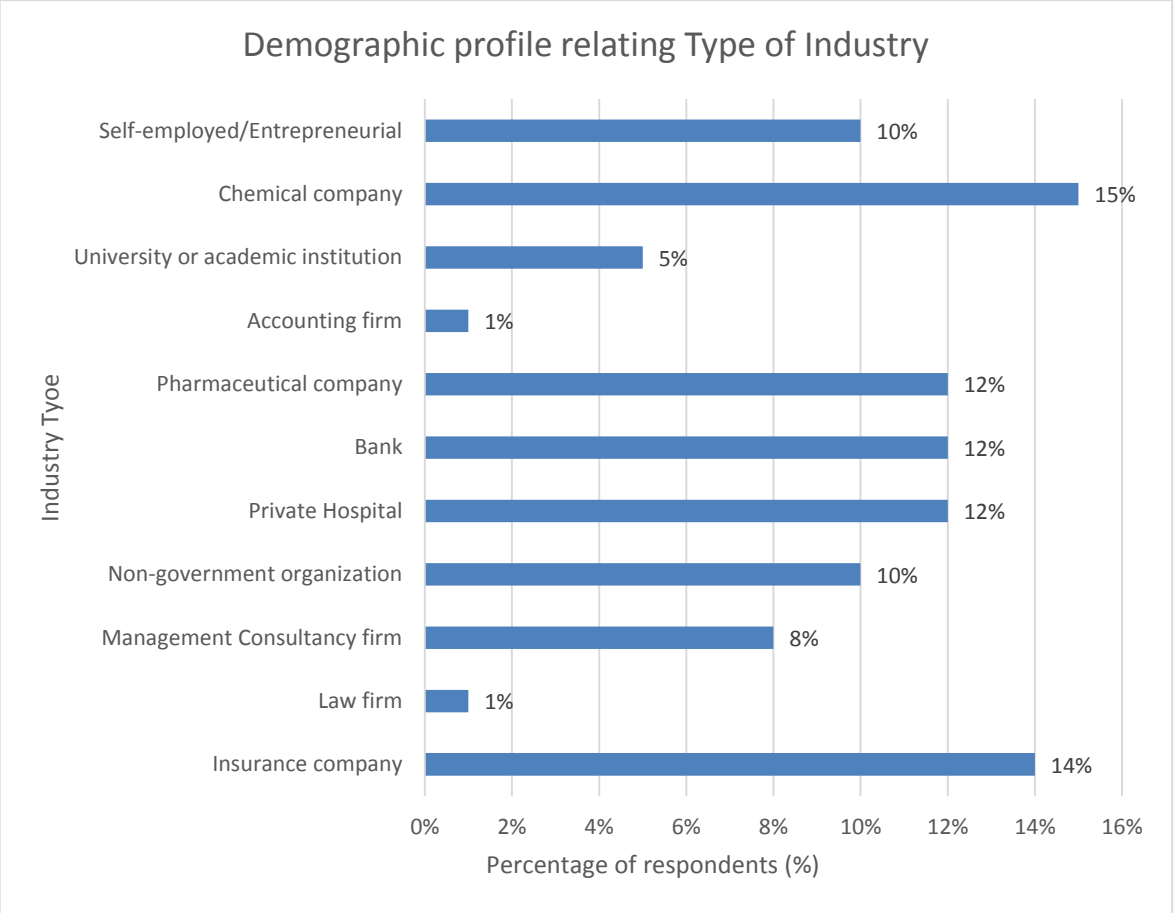


Figure 11: Bar graph representing respondent's industry type

3.9.5 Demographic profile relating to Work Position

The work positions of the employees surveyed were mostly managerial (50%), whereas the other half were non-managerial. The initial sample was supposed to look completely at managerial employees, however, due to the unavailability of such respondents, non-managerial employees were included into the study sample.

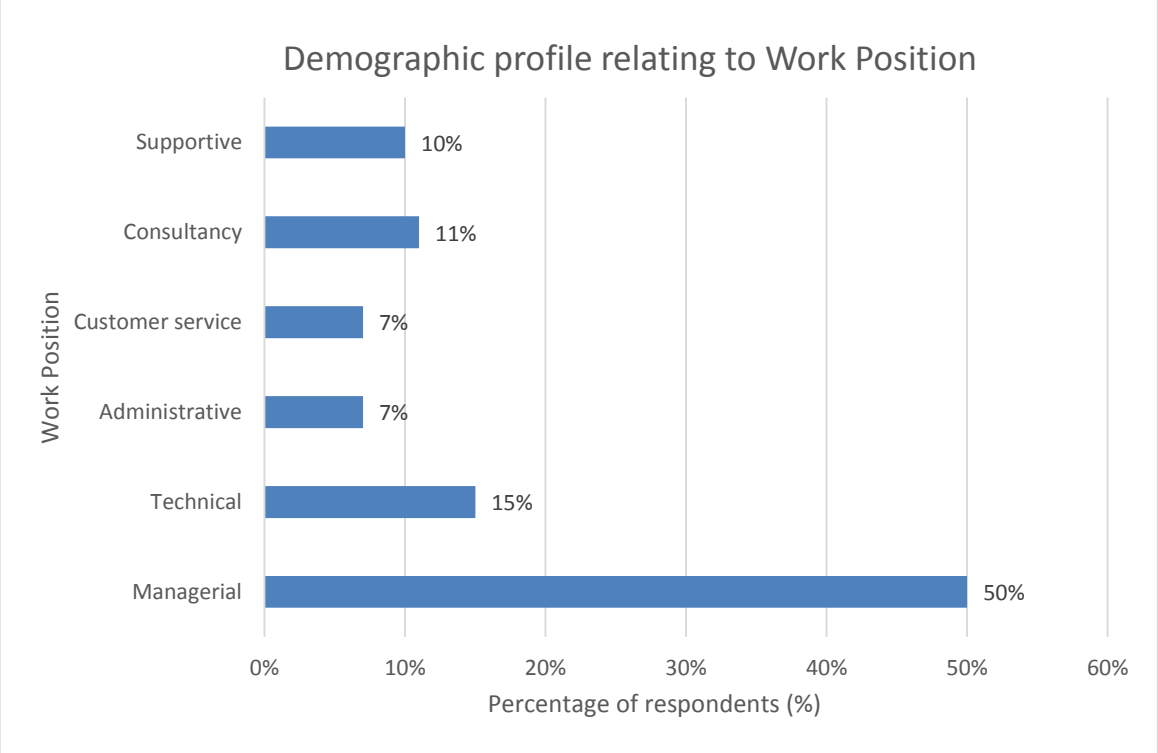


Figure 12: Bar graph representing respondent's work positions

3.9.6 Demographic profile relating to Profession:

The most prevalent professional areas emerging from the sample were management consulting and healthcare firms.

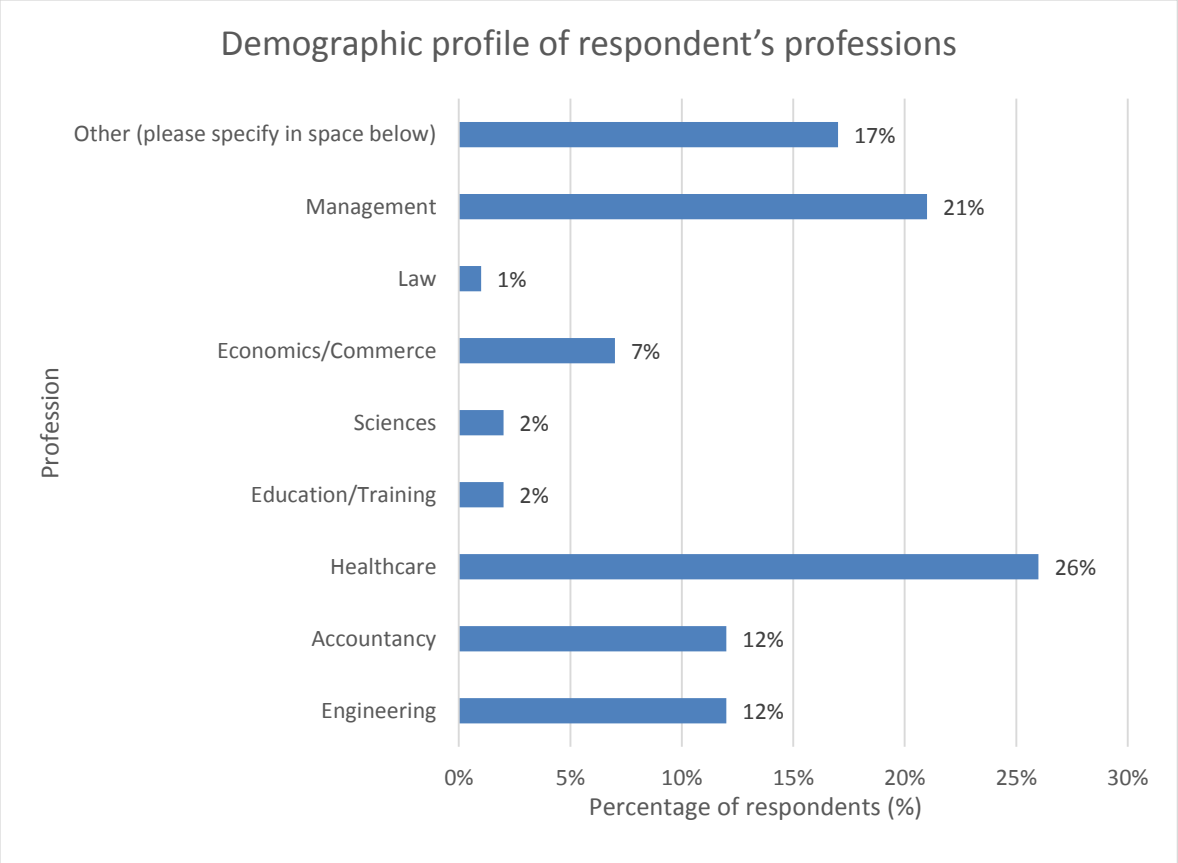


Figure 13: Bar graph representing respondent's professions

3.9.7 Demographic profile relating to Work Experience:

Most of the respondents had 6 to 10 years (31%) of work experience, followed by more than 15 years (19%) and then 3 to 5 years (19%). This was a good indication and required for the study, as at least 3 years of work experience was required for validity and reliability of the responses given.

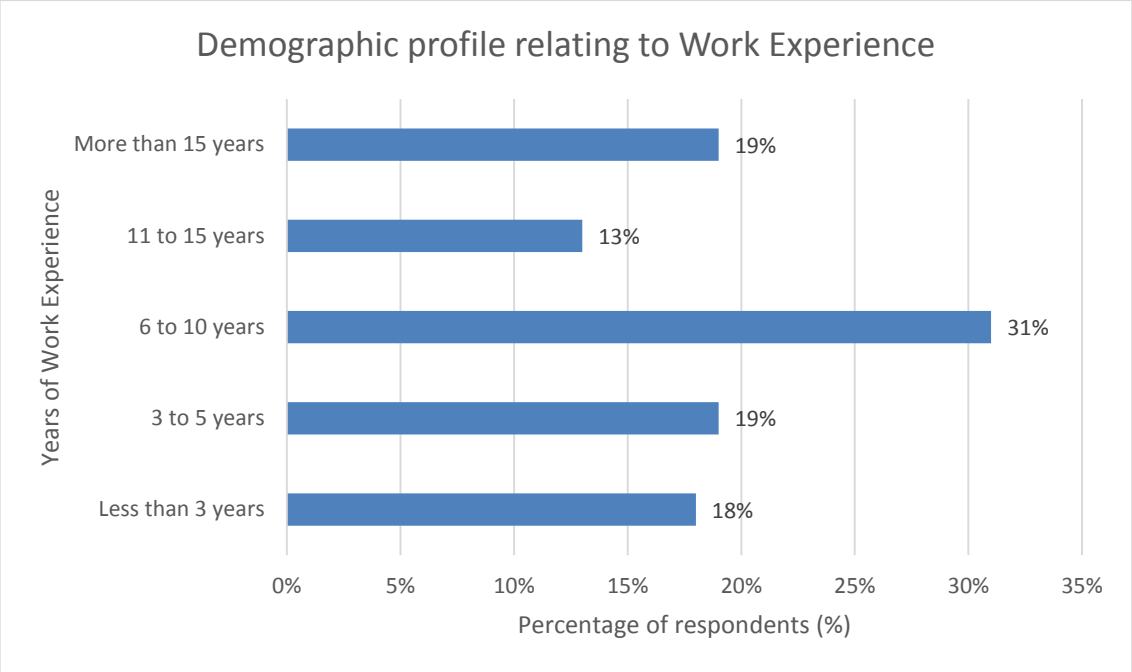


Figure 14: Bar graph representing respondent's work experience

4 CHAPTER 4. PRESENTATION OF RESULTS

4.1 Introduction

The results of this research study will be presented in this chapter. The results of the questions of this research study will be shown in two sets in relation to each of the two research propositions. The first set of data relates to the questions pertaining to Individual Learning Styles and the second set of data pertains to Individual Self-Perceptions of their Workplace Performance Effectiveness. In conclusion of the results, the data will be summarized and graphically illustrated as an inter-battery factor analysis representation.

4.2 Results pertaining to Learning Style

Table 9: Rotated Factor Loadings of Learning Style items

Learning Style Item	Rotated Factor Loadings	
When I learn I like to be doing things.	0.2166	-0.0447
When I learn I like to watch, observe and listen.	0.0653	0.3453
I learn best when I rely on logical thinking.	0.2797	-0.0756
I learn best when I trust my hunches and feelings.	0.0037	0.3780
I learn best when I work hard to get things done.	0.3135	-0.1546
When I am learning, I am responsible about things.	0.2707	0.0006
When I am learning I have strong feelings and reactions.	0.1670	0.0964
When I learn, I look at all sides and aspects of issues.	0.4032	0.0124
When I learn, I like to analyse things and break them down into parts to understand them.	0.2816	0.0244
When I am learning, I am an active person.	0.0825	0.0671
When I am learning, I am an intuitive person.	0.3027	0.0266
I learn best from rational theories.	0.0751	0.2589

Learning Style Item	Rotated Factor Loadings	
When I learn I like to learn from ideas, concepts and theories.	-0.0019	0.4133
When I learn I take my time before acting or doing.	0.1197	0.1416
When I learn I feel personally involved in what I'm doing.	0.1971	0.1715
I learn best when I rely on what I observe.	-0.1118	0.3054
I learn best when I rely on my feelings.	-0.1430	0.2663
I learn best when I can try things out for myself.	0.0831	0.1473
When I am learning I am a reserved person.	0.1568	-0.1864
I learn best when I am receptive and open-minded.	-0.0226	0.4072
I learn best when I am careful	0.1773	0.0569
I learn best when I am practical.	0.1759	-0.0293
When I learn I evaluate things.	0.3189	0.0515
I learn best when I analyse ideas and concepts.	0.2072	0.1026
I apply creative thinking, and different ways of performing everyday jobs.	0.2768	0.2454
I communicate my ideas and thinking in a way people understand.	0.1962	0.1808
I understand people's emotions and engage with them accordingly.	0.1813	0.1996
I think and apply myself in a scientific and systematic way in my daily work.	0.2456	0.1660

4.3 Results pertaining to association with Performance Effectiveness

Table 10: Summary of Rotated Factor Loadings for Performance Effectiveness Items

Performance Effectiveness Item	Rotated Factor Loadings	
I am involved in work that is calculated, mathematical and requires precision.	0.2292	0.1522
I am involved in investigation and research studying as part of my work.	0.2495	0.1391
Technology-intensive tasks.	0.1842	0.0647
Sales, customer or social service tasks.	0.0141	0.1865

Performance Effectiveness Item	Rotated Factor Loadings	
Actively engaging in supporting and teaching others.	0.1143	0.2237
Personal jobs such as counselling & establishing personal relationships with others.	0.1118	0.2208
Information jobs such as planning and research, data gathering and analysis.	0.2514	0.1134
Quality assurance jobs, continuous professional development and measuring performance outcomes.	0.1639	0.0925
Valuing skills: Building relationships and helping others.	0.1583	0.2919
Thinking skills: Information gathering, information analysis, and theory or concept building.	0.2348	0.1236
Decision skills: Quantitative analysis, use of technology, and goal setting.	0.1933	0.0740
Acting or execution skills: Leadership, initiative, and acting out tasks.	0.1560	0.1293
Problem solving skills: Insight Into processes by tackling and solving problems.	0.2288	0.0597
Instinct & networking skills: Open lateral overview and foresight for planning ahead.	0.1683	0.1396
Pro-activeness, accomplishing tasks spontaneously and making uncertain decisions.	0.1859	0.3074
Learning not to repeat previous mistakes and misjudgements when encountering a similar situation.	0.2114	0.2128
Self-education at work and out of work for self-awareness and development.	0.2222	0.1168
Practicing your personal values and beliefs of honesty and loyalty.	0.1860	0.1765
Applying your training and knowledge of concepts to performing practical work situations.	0.2503	0.1071
Engaging in formal training methods (i.e. Lecture type, presentations, computer-based or video-tape material).	0.1592	0.0930
Engaging in collaboration, communicating with an expert, and engaging in coaching and mentoring interactions.	0.1058	0.2783

Performance Effectiveness Item	Rotated Factor Loadings	
Being an advocate for colleagues by motivating them and encouraging their ideas.	0.1227	0.3452
Offering leadership to other individuals or teams.	0.1648	0.3014

4.3.1 Summary of Eigenvalues:

Table 11: Screen plot of the Eigenvalues of the two factor solution

Unrotated Eigenvalues	Rotated Eigenvalues	Variance %
20.10	15.12	58.72%
1.53	6.50	25.24%
0.66	0.66	2.57%
0.53	0.53	2.05%
0.51	0.51	1.98%
0.35	0.35	1.35%
0.33	0.33	1.29%
0.22	0.22	0.87%
0.18	0.18	0.69%
0.16	0.16	0.62%
0.15	0.15	0.58%
0.14	0.14	0.54%
0.13	0.13	0.50%
0.12	0.12	0.47%
0.11	0.11	0.43%
0.10	0.10	0.39%
0.09	0.09	0.35%
0.08	0.08	0.31%
0.07	0.07	0.27%
0.06	0.06	0.23%
0.05	0.05	0.19%
0.04	0.04	0.16%
0.03	0.03	0.12%
0.02	0.02	0.08%
25.76	25.76	100.00%

In *Table 9*, the first column represents the Eigenvalues before rotation and second column represents the Eigenvalues after rotation. Only the first two values can be seen to be rotated, together accounting for 83.96% of the variance. Thus resulting in a two factor outcome. This can be explained by Parallel Analysis.

4.3.2 Parallel Analysis as the method for Factor Retention:

The aim of the exploratory method of inter-battery factor analysis is to reduce the factors to determine the underlying latent structure or dimensionalities connecting the two datasets (Stacey, 2015). In order to accomplish this, the analysis of the results requires the decision of how many factors to retain from the exploratory factor analysis. As per Hayton, Allen and Scarpello (2004), this is a key decision to make among the others such as the factor analytic method and rotation method to be used as construct validity is important in behavioural studies such as this. Factor Analysis was used as the quantitative data reduction method to determine the number and nature of common factors, as it is favourable for the construct validity of psychological constructs and exploratory factor analysis is appropriate for scale development. Parallel Analysis (PA) is the method that was chosen for determining the number of factors to retain because it is reported to be the most accurate and almost always (92%) correct.

The PA was conducted in a 4 step-by-step technique as explained by (Hayton et al., 2004), where the random data was first generated, the Eigenvalues were then extracted from the random data, the average Eigenvalues were determined and lastly the real data was compared to the parallel random data. As from the Learning Style and Performance Effectiveness Questionnaire conducted in this study, each item represented a single learning style preference dimension. The results reflect that there are intrinsic and extrinsic sources of association between learning style and performance effectiveness in the workplace. This is in favour of the two factor solution as reported in several empirical studies. This two factor solution is shown to be more consistent with prior research which also reflect

internal and external dimensions. The explanation of PA is that the significant parts of the data with an underlying or latent factor structure or dimension have larger eigenvalues than the parallel components derived from the random data with the same number of variables and sample size. The meaningful components have larger eigenvalues than the parallel eigenvalues from the random data (Hayton et al., 2004).

4.4 Summary of the results

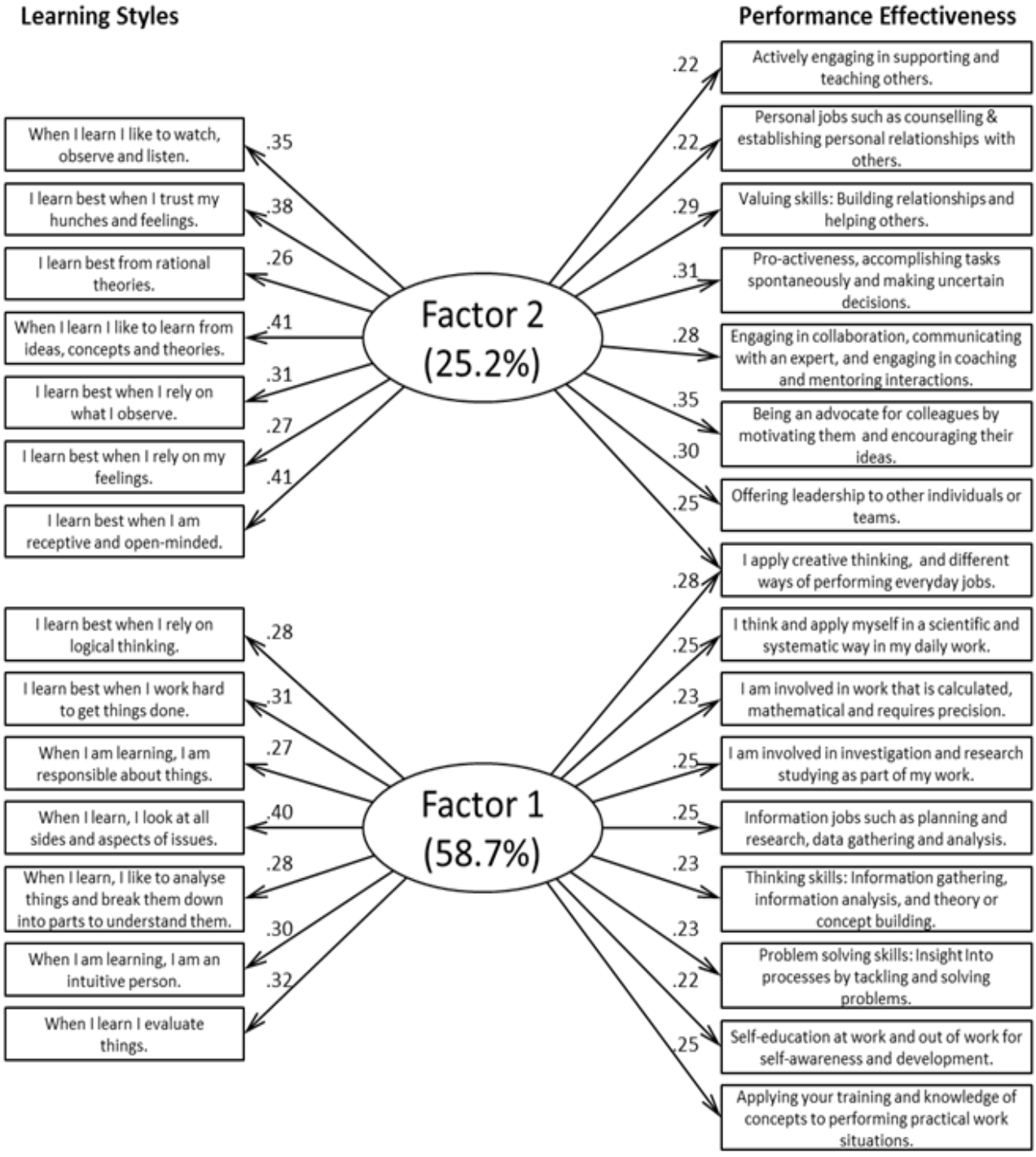


Figure 15: Inter-battery Factor Analysis representation of two factor solution

In summary of the results, this two factor solution as shown in *Figure 15* shows all the items with the highest factor loadings that contribute to the creation of the two underlying factors or dimensions. The two factors with the highest eigenvalues accounting for 58.72% and 25.24% respectively were retained, together accounting for 83.96% of the variance. It is found to be consistent with prior research which also reflects an underlying internal and external dimensionality that associates learning style to performance effectiveness. The underlying or latent factor structure or dimensions are derived from having the larger eigenvalues than the parallel components derived from the random data which makes these the meaningful components or dimensions (Hayton et al., 2004). These meaningful components have larger eigenvalues than the parallel eigenvalues from the random data, which in this study are represented by the new dimension 1 accounting for 58.7% and the new dimension 2 accounting for 25.2% of the data (Hayton et al., 2004).

4.5 Limitations

The limitations of this study are noted as follows:

- This study looks at a self-reported measure of performance effectiveness, which can be argued from both sides. On one hand, a self-reported assessment could be done best by the employee as the employee possesses the best knowledge of how the job is performed. However, on the other hand, the concern lies in the fact that employees may tend to over report their performance to provide a socially desirable response or due to a skewed self-perception.
- The actual sample size was smaller than anticipated as some respondents did not fully complete the survey, as so important questions were not answered.

- There were aspects and variables that were not covered in this research paper due to time, scale and availability limitations, which could be fulfilled in future research.

5 CHAPTER 5. DISCUSSION OF THE RESULTS

This chapter discusses the results derived from the online questionnaire as summarized in chapter 4. The discussion will be separated into two sections. One section will focus on the construct of Learning Style and the dimensions that arise. The second section of the discussion will look at the associations between Learning Style and Performance Effectiveness within the workplace. Thereafter, conclusions on each of the two research propositions will be presented.

5.1 Learning Style Dimensions in the workplace

There are certain learning style dimensions that prominently arise in the workplace from those categorized by Kolb's Experiential Learning Theory seen to be associating to effective work performance. The results derived prove proposition 1 to be true, however, this obviously needs to be qualified with appropriate reasoning. There are certain learning style dimensions that arise in the workplace which link to self-perceived performance effectiveness. This means that there is a latent structure of learning style dimensions or there are certain underlying learning style dimensions that create communalities or an association between individual learning style and performance effectiveness criteria which are perceived to result in higher levels of performance effectiveness in the workplace.

The learning style dimensions that predominantly arose from the data served as communalities which form the underlying basis of the learning styles and linked to workplace performance effectiveness. The foremost prominent learning style dimensions that arose was firstly Abstract Conceptualization (AC) showing the most number of items and secondly, Concrete Experience (CE) being the second-most prominent learning style dimension, followed with Reflective Observation (RO) and Active Experimentation (AE) items appearing less prominently.

5.1.1 The prominent learning style dimensions and learning styles of employees in the workplace

This indicates that in relation to Kolb's learning style cycle, the 'thinking' (AC) and 'feeling' (CE) dimensions which form the perception continuum of how we think about things are the dominant learning styles that emerge followed by the possessing continuum made up of the AE and RO learning style dimensions which do emerge as well but not as prominently and show less association to performance effectiveness than the AC and CE dimensions (Shahabadi & Uplane, 2015). Therefore, the two dominant learning styles that emerge from the resulting dimensions are the Converging (thinking and doing) and Diverging (feeling and watching) styles, which when compared to the learning style dimensions underlying the performance effectiveness items, reveal two factors or dimensionalities that associate the two constructs.

Several studies have compared the learning styles of learners with their academic performance in recent years (Shahabadi & Uplane, 2015; Shaw, 2012; Sun et al., 2008; Wang et al., 2006). Shahabadi and Uplane (2015) is one such study which showed that the learners who performed more than one task at the same time or synchronously preferred the Assimilating and Diverging learning styles. This reflects some light on the fact that possibly even in the workplace, employees who perform several work tasks (where learning is inclusive of a work task) at the same time prefer the Assimilating (AC/RO) and Diverging (CE/RO) learning styles. On the other hand, the same study revealed that learners who performed one task at a time or asynchronously preferred the Assimilating and Converging learning styles. This again reflects some light on the fact that possibly even in a workplace context, employees who prefer focusing on performing one work task (where learning is inclusive of a work task) at a time prefer the Assimilating (AC/RO) and Converging (AC/AE) learning styles. In relating this to the results obtained in this study, there is some similarity and there is some contrast. It can

be agreed that performance (whether academic or workplace) does differ with differences in individual leaning styles.

Shahabadi and Uplane (2015) explained that Convergers and Assimilators performed academically higher than Divergers and Accommodators, whereas Wang et al. (2006) sums up that the Diverger and Assimilator groups perform higher than the Convergers and Accommodators (Shaw, 2012). The same effect was shown in this study, where the Converger and Assimilator groups perceived higher performance effectiveness than the Diverger and Accommodator group, however, both sets of learning styles were seen to be associated with self-perceived performance effectiveness, in different work areas and in different proportions. It was concluded that the Assimilator (AC/RO) and Converger (AC/AE) learning style communalities contributed a larger proportion in the association with self-perceived effective work performance, in tasks requiring logical thinking, all rounded reasoning, and practical application of detailed technical knowledge and skill. Therefore, similar to the study by Shahabadi and Uplane (2015), the results of this study derived *Abstract Conceptualization* to be a dominant dimension, whereas different to this study Wang et al. (2006) showed the RO type to be the dominant dimension. The similarity in findings is seen to be relevant, as within the work environment, employees follow the procedures and protocols of their workplace and as expected from abstract thinkers and Convergers, they find practical uses for theoretical ideas and concepts to solve problems and make decisions (Kolb, Boyatzis & Mainemelis, 2001).

The Diverger (CE/RO) and Accommodator (CE/AE) learning style communalities contributed a smaller proportion to the association of learning style with effective work performance perceived in tasks requiring spontaneity, change, adaptation, and understanding within different learning situations. This lowered the percentage contribution for individuals who have a preference for proactive, collaborative, and interpersonal tasks, and for those who are good SWOT analysers of situations. This made *Concrete Experience* the second dominant

dimension. This can be explained by employees in complement, also requiring to generate ideas, view situations from different points of view and gather information from various sources through open interaction, collaborative brainstorming or personalized feedback (Kolb et al., 2001).

5.2 Associations between individual learning style and the self-perceived effectiveness of individual work performance.

In relation to proposition 2, there were associations revealed between the two constructs of learning style and performance effectiveness, thus proving proposition two correct. Individual's learning styles were shown to have associations with the type and mode of work expected from the employee, indicating that the content of the work performed together with its structure (Abdul-Rahman & Du Boulay, 2014) and interaction level, the mode or method of performing the task as well as the motivation during the task, participation and satisfaction achieved from the work performed, were seen as significant factors affecting self-perceived work performance (Boyle, 2012; Cassidy, 2004; Dunn (1984); Dunn, Beaudry, & Klavas, 2002; Graf et al., 2009).

From the various learning style and performance effectiveness items, the communalities were seen to be grouped together to reveal two latent factors or larger underlying dimensionalities (Hayton, 2004) associating learning style and performance effectiveness in the workplace, which together account for 83.96% of the variance. In drawing from the results, there were two prominent learning styles that gave rise to new dimension 1, and two prominent learning styles that gave rise to new dimension 2, both of which link or provide an association between learning style and workplace performance effectiveness. The first two learning styles associated to dimension 1 are the Assimilators and the Convergers. The second two learning styles associated to dimension 1 are the Divergers and Accommodators. Looking at these results shows that there is a

kind of polarization of items that pull each of the two learning styles together and link them to the performance effectiveness criteria to create two new dimensions to associate the two sets of items.

5.2.1 The dimensions revealed from the two factor solution

The first new dimension, which accounts for 58.72% of the variance between learning style and workplace performance effectiveness, takes all the 'internal factors' of the learner's intuition or instinct, ability to analyse, evaluate and form holistic judgements that constitutes the AC learning style dimension. The learning style dimension characteristics can be grouped with the learner's performance factors which encompasses the learner's self-efficacy, individual logic and intellectual thinking, application of an individual's personal skill set (includes flexibility), inclination of abilities (includes anxiety), actual competence in performing a task, creative intelligence in applying the content (individual's flexibility, ability to deliver quality, and creative knowledge (use of technology or multimedia) (Brunken et al., 2003; Furnham, Jackson, et al., 1999; Hong, 2002; Kolb, 1984). This grouping of factors has created a new dimension called 'intrinsic analytical processing'.

This dimension is the dominant association (58.72%) between learning style and workplace performance effectiveness. As the primary or key association it tells us that having a high level of adaptive competencies and workable skills sets within the work environment is essential for workplace performance effectiveness.

The second new dimension, which accounts for 25.24% of the variance between learning style and workplace performance effectiveness, takes all the 'external factors' of observation, ability to be receptive and perceptive of the surrounding environment, use of rationality in understanding or making sense of external ideas and concepts, which constitute the CE learning style dimension and groups these items with performance factors relating to an individual's ability to

collaborate, engage with colleagues, help, support and be an advocate for others, and offer leadership and personal value through workplace interaction. As per D'Amore et al. (2012), the external learning environment or setting itself (Hassan et al. (2012) and whether it is conducive to an individual's personal preferences (Dunn, 1984), in terms of whether an individual prefers an openly collaborative, stimulating and engaging or closed, isolated, and focused environment (Huang et al., 2012; Morris et al., 2005) or whether they are motivated more by themselves or the environment that they work in (Irvine & York, 1995; Reid, 1987). This does indicate how an individual's learning style, ability to be receptive and perceptive and how it would impact on their work performance. Furthermore, information processes and methods used impact on an employee's rationality and how they would make sense of external ideas and concepts (Dunn, 1984). This grouping of factors has created a new dimension called 'extrinsic global processing'.

This dimension is the less dominant association (25.24%) between learning style and workplace performance effectiveness, yet is still significant in ensuring effective workplace performance as it has been shown by Pruet et al. (2014) that a collaborative learning style has a significant effect on learners above average academic performance. This dimension seems to act as a supportive, aiding, and augmenting factor that complements an individual's intellectual ability, personal work skills set and competence, and links the individual to its surrounding environment, professional colleague network through an interactive, engaging and collaborative outlook or attitude to the workplace.

The results in relation to proposition 2, upon analysis reveal the connections between the individual items of learning style and workplace performance effectiveness, and show both intrinsic and extrinsic factors as suggested and inferred by many (Boyle, 2012; Dunn, 1984; Dunn, Dunn & Price, 1989; Dunn, Beaudry & Klavas, 2002; Kolb, 1984; Kolb et al., 2001).

The first or primary set of connections demonstrate that individuals who prefer learning through logical interpretation, focused rational and critical thinking, analytical problem solving, analysis and evaluation (Andreou, Papastavrou, and Merkouris, 2014). This also involving intuition and creative application of their skills and personal abilities are most effective at performing complex work tasks involving systemic processes, operational planning, investigation and research analysis, theory and concept building, and application of knowledge and skills development to work situations (Abdul-Rahman & Du Boulay, 2014; Andreou et al., 2014).

The second set of connections show that individuals who learn through observation, watching, and listening, who are more receptive of the external dynamics at play within their surrounding environment, and who have a high emotional and intuitive ability are most likely to perform effectively at work tasks involving authentic leadership, personal relationship building, active engagement, counselling, mentoring, and supportive interaction with fellow colleagues. Thus indicating that closely connected learning styles and learning objectives or work projects in the way they are performed, processed and delivered, is perceived to be performed better by the employee (Ayersman, 1996; Bontchev & Vassileva, 2011; Buch & Bartley, 2002; and Kim et al. (2006). This includes not only better performance effectiveness outcomes but also effective outcomes in employee behaviour, attitude and motivation (Morris et al., 2005; Ocepek et al., 2013).

5.2.2 Relating the new dimensions to Kolb's theory

Experiential Learning Theory by Kolb (1984) explained that learning is a process of human adaptation. Thus, individual learning styles can also be adaptive. Creativity research and thinking has been said to be more inclined towards individuals with a divergent learning style with a CE and RO dimension. The results also show that Accommodators (CE/AE) also perceive themselves to share that ability with the Divergers (CE/RO), and rightly so as shown by Kolb's

theory, as both share the ability for CE. In looking at the another perspective, research on decision-making has been shown to be more inclined towards individuals with convergent learning styles with an AC and AE dimension, as has been confirmed in the results, which furthermore show that Assimilators (AC/RO) are good analytical thinkers and decision makers. However, the results also indicate that Assimilators (AC/RO) and Convergers (AC/AE) also perceive themselves to be able to apply creative thinking and different ways of doing a job, which represents the ability to understand abstract concepts (AC) effectively.

In line with the literature Boyle (2012), a close look at the results substantiates that emotional elements such as motivation or interest in subject matter, persistence or focus to the task at hand, responsibility and balancing of conformist and non-conformist behaviour, and a strong preference for structure all contribute to what ones learning style is and at the same time affects ones productivity (Lovelace, 2005). The connections found from the results of this study clearly demonstrate that motivation or interest, focus and persistence, responsibility and structure are all characteristics forming new dimension 1, that acts as significant contributors to effective performance in work tasks that require persistent analytical thinking skills, focused problem-solving ability, and the ability to translate theoretical training and conceptual knowledge into daily work tasks in the workplace. Coherent with the learning style theory explained by Boyle (2012), the results explain that the RO learning style dimension does contribute to performance effectiveness. It is shown that through adopting an all rounded and holistic view when applying thinking skills to a work task or project, new dimension 1 is being utilized. This contribution is however the minor contribution to new dimension 1 as opposed to the other learning style dimensions, as this is the only RO item that emerged in this connection.

Proper discerning ability, observation skills and awareness of one’s own environment are the items that adds value to new dimension 2. The way in which these RO items are split to contribute to both dimensions is interesting, and could

be attributed firstly, to the connection of new dimension 1 with an employee's ability to intercept their environment through clear perception which is required when building lasting and meaningful personal relationships as well as when acting from a position of leadership, as opposed to perfunctory and superfluously perceived meetings or interactions. Secondly, it can be attributed to the connection of new dimension 2 to an employee's ability to see something through all paradigms and from all positions and effectively commit to memory for reflection, which is required in multi-problem solving and decision-making tasks at work as opposed to impulsive evaluation and decision-making (Boyle, 2012).

5.2.3 The role and effects of personality traits:

The two new dimensionalities that have been revealed to underlie the association between learning style and performance effectiveness is very interesting and can be substantiated by Vasileva-Stojanovska et al. (2015) who postulates that personality factors are significant contributors to learning style and self-perceived performance effectiveness, which is what the associative dimensions that arise actually reveal in their differences. Bokhari (2011) shows that not all personality traits have an effect on learners performance and that three traits, analytical (sensitivity and observation of surroundings, people and ideas), variation (attitude to new opportunities and experiences), and self-critic (self-esteem related views) types have an effect on performance. It has also been forwarded by Liao and Chuang (2004) that the association between personality and job performance may not be the same for all employees and is contextual.

In line with that postulated by Brunken et al. (2003), Chamorro-Premuzic (2008), Furnham, Jackson & Miller (1999), Furnham, Forde & Ferrari (1999) and Furnhamn & Miller (1997), and Vasileva-Stojanovska et al. (2015), this result indicates that personality factors do have a considerable impact on how well an individual performs their work tasks and how effectively they view themselves performing and coping in their workplace (Ferguson, 2001). This validates the

theory by Kolb, Boyatzis, and Mainemalis (2001) and Kolb (2005), who confirm that personality type, educational specialization and level, profession, current job, and competencies, all determines how an individual's learning style is shaped. There are studies which suggest that even though intellectual or cognitive abilities significantly affect performance effectiveness in academia (Chamorro-Premuzic & Furnham, 2008; Chamorro-Premuzic, Furnham, & Lewis, 2007), a combination of one's personality traits have a significant influence on the way they perform. In the same way, the results derived align to this idea within a workplace context, which conveys that learning style and performance effectiveness can be considerably attributed to individual personality traits or dimensions. An earlier study by Furnham, Jackson, et al. (1999, p. 1113) also validated the role of personality on learning style and the impact of both of these constructs on workplace performance by stating that "personality measures are logically and statistically significantly related to successful job performance", and it was found that the overlap between learning style and personality was 10%. According to Eysenck (1958)'s personality theory, the personality dimensions were recognized as conscientiousness, neuroticism, extroversion and agreeableness. According to Furnham (1992), the personality dimensions of extraversion, neuroticism, psychoticism and dissimilation show correlation to Kolb's LSI (Kolb, 1976).

As can be seen in the study by Vasileva-Stojanovska et al. (2015), 'Neuroticism' was recognized as a personality dimension which plays a significant role on educational performance outcomes, however, was a dimension that was shown to not be clearly related to learning style. 'Extroversion' was a personality dimension shown to play a significant role on transferrable skills such as communication, collaboration and interactivity. All dimensions of learning style have shown to relate to elements of personality types (Jackson and Lawty-Jones, 1996). Furnham (1992) went as far as to suggest that 'learning style' arises as a sub-construct of personality, and need not be measured independent of one another. These very effects of ones personality on learning style in the workplace can be reflected in the results obtained, where upon analysis it can be identified

that the first new dimension (accounting for 58.72% of the association), which is the aspect of an individual that is more analytical, systematic, reflective, logical and conceptual in approach relates more to the 'psychoticism' and 'conscientiousness' personality type and nature. This premise has been shown to relate to perceived satisfaction (Trapmann, Hell, Hirn, & Schuler, 2007), which connects the person to their self-perception of their workplace performance effectiveness.

Moreover, it can be identified that the second new dimension (accounting for 25.24% of the association) is the aspect of an individual that is more sociable, communicative, personable, collaborative, leading, advocating, and inclined towards building and maintaining interdependency within personal relationships. This indicates that it the dimension that is the more 'extroverted' and 'agreeable' sides of a person's nature (Furnham, Jackson, et al., 1999). As noted in Furnham (1992), both the personality measures of 'extraversion' and 'psychoticism' strongly correlates with cognitive or thinking learning style dimension, i.e. the AC dimension, which constitutes the Converging and assimilating learning style.

5.2.4 The association of personality and perceived satisfaction with learning style and performance effectiveness:

As posited by Gurpinar et al. (2010) there is a relationship between competence, personality, learning style and educational performance (Vasileva-Stojanovska et al., 2015). It is also added that individual personal satisfaction gained during the learning process has a significant impact on performance effectiveness (Cole et al., 2014; Eom et al., 2006; Shaw, 2012), and that this perceived satisfaction is dependent on psychophysical factors such as habits, motivation, interests, attitude (Bokhari, 2011; Pruet et al., 2014), relationship paradigms, participation level (Cole et al., 2014; Eom et al., 2006; Shaw, 2012) and environmental preferences, all of which is deemed to constitute the construct of personality (Furnham, Forde, et al., 1999; Furnham, Jackson, et al., 1999). Perceived work

satisfaction can thus be expressed as an employee's perception of their work environment and performance relative to their expectation thereof. The factors amongst the three constructs of learning style, personality and perceived satisfaction are noted to be inter-related and coming from a common place. Therefore, individual perceived satisfaction from learning is affected by ones learning style, predisposing personality traits and learning environment, and acts as another factor that associates learning style to performance effectiveness (Vasileva-Stojanovska et al., 2015).

From the results, it can be determined that the two new dimensions or factors associating learning style and performance effectiveness emerging as intrinsic and extrinsic in nature (Gorsuch, 1989) from the factor analysis retention decision (Hayton, 2004) can be seen denominated and explained as follows:

New dimension 1: This can be explained as the 'intrinsic focus' or locus of control that accounts for an extensive portion of the association between learning style and self-perceived performance effectiveness. It can be termed as 'analytical processing', which focuses on conceptual and logical thinking and reasoning, intelligence, and technical work competence. Personal work and learner satisfaction has shown to improve application to work tasks (Cole et al., 2014; Eom et al., 2006; Furnham, Forde, et al., 1999; Furnham, Jackson, et al., 1999; Gurpinar et al., 2010; Tatjana Vasileva-Stojanovska et al., 2015), which has shown to be impacted by the surrounding environment and the learners learning preference or style. In terms of personality, analytical processors have psychological elements focused on intricate detail and the step-by-step analysis of a process. This is not contended by the literature as it can be substantiated that in the workplace, employees have to show Propositional (knowledge about) and Procedural (knowledge of how) competencies. Furthermore, the Job Competence Model Mansfield (1996) identified the skills involved in four aspects of competence, which substantiates why competency and skill application is the key association between ones learning style and the way they perform in the

workplace: Task or technical skills, Task management skills (planning, decision making, prioritizing), and Contingency management skills (managing unexpected events and events beyond the scope of routine instructions). As found in this study, the key personality traits of an individual who has a greater 'analytical processing' facet is a combination of aggressive and assertive (extraverted side), highly autonomous, highly independent, preferably introverted, enjoys activities that challenge their intellect, and are naturally anti-social (Dunn & Dunn, 1993) and Boyle, 2012). Analytical processors have shown to be of mainly converger and assimilator learning styles, with AC being the dominant learning style dimension.

New dimension 2: This can been explained as the 'extrinsic focus' or locus of control that contributes significantly yet less extensively then dimension 1 does, to the association between learning style and self-perceived performance effectiveness. It can be termed as 'global processing', which as per Dunn & Dunn (1993) and Boyle (2012), focuses largely on sociological and emotional elements, where emotional intelligence, perception and transferrable skills of collaboration, effective communication and interpersonal interactivity are involved. The psychological elements are composed of general, strategic and macroscopic goals, where anecdotal information is transferred and reflective observation of the environment is practiced well. Dispositional (values and attitudes) forms an important auxiliary component of workplace competencies. The Job Competence Model Mansfield (1996) identified role and environment skills (interpersonal understanding, working in, and using the physical, organizational, and cultural environment) as a valuable component of effective performance. The key personality traits of an individual who has a greater 'global processing' facet as found in this study, is a combination of passive, sensing abilities, dependent/interdependent, naturally extroverted and easily social in public (however can be reclusive and reflective when necessitated), uncomfortable with theoretical matters, and adapt easily to new experiences (Dunn & Dunn, 1993 and Boyle, 2012). Global processors have shown to be mainly of diverger and

accommodator learning styles, with CE being the dominant learning style dimension.

Therefore, workplace learning was thus conceptualized in the form of the knowledge or skill set and ability that represent the performance outcomes. *Figure 16* has been created to illustrate the associations and interactions between the discussed constructs and underlying dimensionalities of the associations between learning style and self-perceived performance effectiveness, as explained in this chapter:

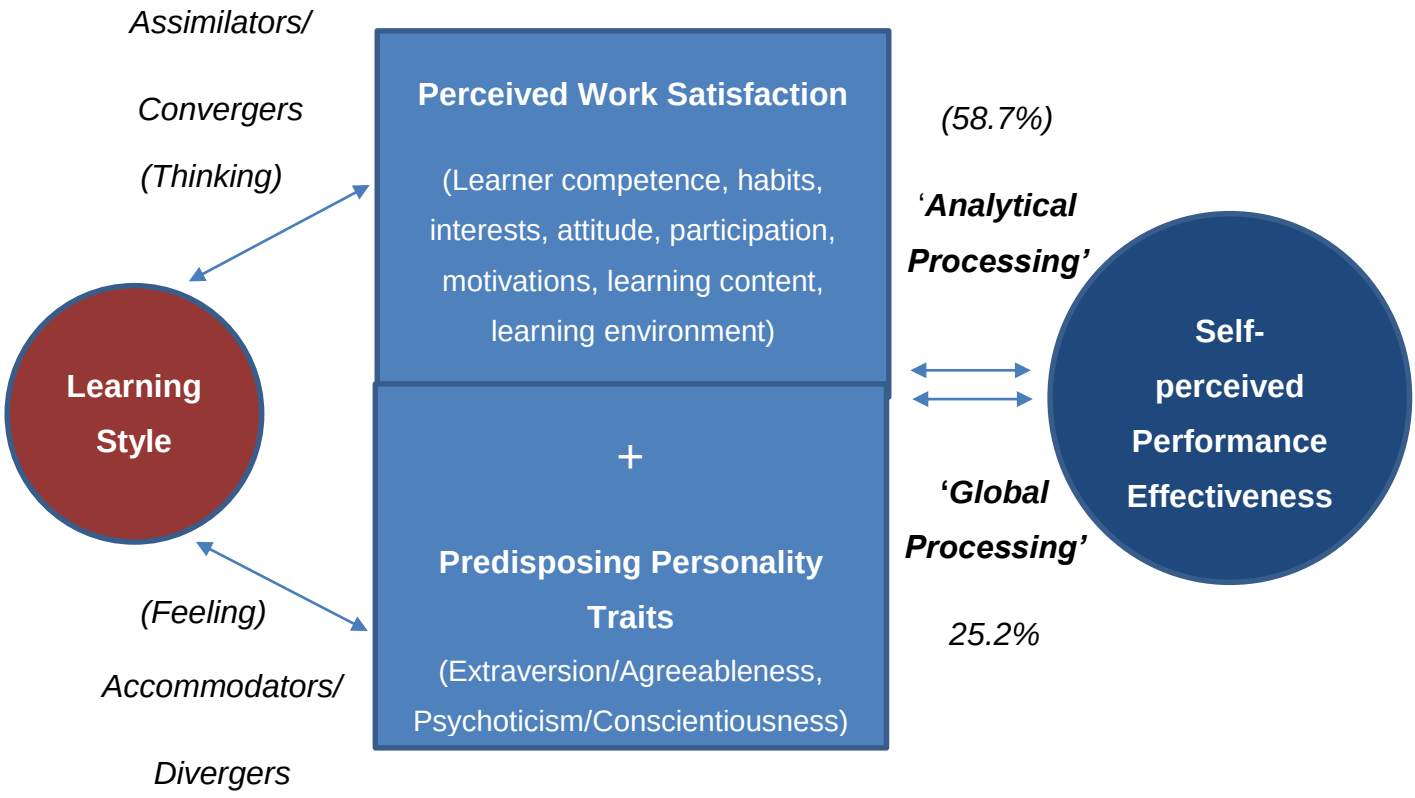


Figure 16: Interactions between learning style, personality, perceived work satisfaction and self-perceived performance effectiveness in the workplace.

5.3 Conclusion

The results indicate that *firstly*, there are different learning style dimensions that arise in the workplace that overlap Kolb's constructs to give new dimensions. There were two learning style dimensions that associate learning style and workplace performance effectiveness. This shows that there are other contributing factors to how individuals learn and perform effectively in a work environment. *Secondly*, associations between learning style and performance effectiveness in the workplace have been established with an 83.96% variance in total. The two most dominant learning style dimensions that emerged were the AC and CE dimensions, with the Convergers and Divergers being the two dominant individual learning styles.

The main proposition that answers the main problem of this research is thus achieved, as there are associations between the self-perceived effectiveness of individual work performance and individual learning style preferences that give rise to new Learning Style dimensions in workplace learning that have been found. Through this research study, it has been found that a combination of an individual's personality traits and perceived satisfaction factors forms the new 'analytical processing' and 'global processing' dimensions constituting an individual, which have been determined as the associations between ones learning style and self-perceived performance effectiveness in the workplace. As per the correlation between personality measures and learning style measures, it is the 'feeling' (heart) aspect of personality that the Accommodator and Diverger learning styles share and are driven by, and it is the 'thinking' (head) aspect of personality that the Assimilator and Converger learning styles share and are driven by, both of which are seen as independent of introversion or extraversion, as each dimension can display either. Instead, in relation to EPT (Eysenck., 1958 and Furnham, 1992), the two factor solution indicates that the 'extraversion' and 'agreeableness' types constitute the 'global processor' and the 'conscientiousness' and 'psychoticism' types constitute the 'analytical processor'

individual types. It can be stated here however, that these typologies are not static. They are dynamic and fluid, and can change with time and circumstance.

The extent to which an individual possesses the ‘analytical processing’ and ‘global processing’ dimensions according to how individuals evaluate and manifest their learning and experiences, determines whether an employees can be categorized as inclined towards being intrinsic ‘analytical processors’ or extrinsic ‘global processors’. This conclusive theory would be based on what the individual’s dominant individual learning/working style is, through which they determine themselves to perform most effectively. Therefore, it is found through this study, that the ability to be an ‘analytical processor’ is perceived to associate with effective workplace performance more significantly than being a ‘global processor’ in the South African workplace. In conclusion, the underlying associations revealed from the parallels of the two factor solution is that perceived work satisfaction and personality traits make up the ‘analytical processing’ and ‘global processing’ abilities, as defined in this study, each of which associates an individual’s learning style to their workplace performance effectiveness.

6 CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

This chapter consolidates the research results and findings on the prominent workplace learning styles and the associations between learning style and performance effectiveness. It provides the recommendations for which the developments of this study could add value and possibly contribute in the field of organizational behaviour and psychology. The relevance of this study and the methodological contributions are also touched upon. The chapter concludes by stating the limitations of the study and how this may be improved and lastly from here, the propositions for further research are suggested for ongoing developments within the related fields for enhancing organizational effectiveness and performance.

6.1 Conclusions on workplace learning styles:

There were certain individual learning style dimensions that were shown to be prominent within the workplace. The Abstract Conceptualization (AC) learning style dimension was the most prominent and the Concrete Experience (CE) dimension being the second-most prominent learning style dimension. Furthermore, the Reflective Observation (RO) and Active Experimentation (AE) learning style dimensions appear less prominently than the AC and CE. In relation to Kolb's learning style cycle, the 'thinking' (AC) and 'feeling' (CE) dimensions are prominent, which form the perception continuum of how we think about. Therefore, the two dominant learning styles that emerge from the resulting dimensions are the Converging (thinking and doing) and Diverging (feeling and watching) styles.

6.2 Conclusions on the association between learning style and workplace performance effectiveness:

There were several important associations that emerged between learning style and performance effectiveness items. There were two latent underlying dimensionalities that accounted for an 83.96% total variance, which associates individual learning style and self-perceived performance effectiveness in the South African work context.

The first new dimension, which accounts for 58.72% of the variance and association between learning style and workplace performance effectiveness, takes all the internally derived factors of intuition or instinct, ability to analyse, evaluate and form holistic judgements that constitutes the AC learning style dimension and groups these items with performance factors of individual logic and intellectual thinking, application of an individual's personal skill set, inclination of abilities, actual competence in performing a task, creative intelligence. This grouping of factors has created a new dimension called intrinsic 'analytical processing'. It tells us that having a high level of adaptive competencies and workable skills sets with a 'thinking' personality within the work environment is essential for workplace performance effectiveness.

The second new dimension is the less dominant association, which accounts for 25.24% of the variance and association between learning style and workplace performance effectiveness. It takes all the externally derived factors of observation, ability to be receptive and perceptive of the surrounding environment, use of rationality in understanding or making sense of external ideas and concepts, which constitute the CE learning style dimension and groups these items with performance factors relating to an individual's ability to collaborate, engage with colleagues, help, support and be an advocate for others, and offer leadership and personal value through workplace interaction. This grouping of factors has created a new dimension called extrinsic 'global

processing'. It tells us that having a certain level of collaborative, empathetic and 'heart' as a leader with a 'feeling' personality within the work environment is essential for workplace performance effectiveness.

6.3 Conclusions of the study

It can be concluded from this study that Kolb's Experiential Learning Style Theory is very relevant and applicable in the workplace context, however, there are other underlying dimensions that have been brought to the surface through this study. The stronger emergence of certain learning style dimensions and certain learning styles have been shown and are self-perceived to be associated to effective workplace performance. Furthermore, these associations prove that the theory laid down by both major learning style theorists Kolb and Dunn are valid, by showing that the association between learning style and performance effectiveness in the workplace is one more of individual professional competencies and the differences in these competencies between individuals rather than intelligence itself, and that how an individual views the application of this competence within their workplace environment is based on their personality traits as well as their interests, attitudes and personal motivations within their broader or immediate workplace environment. Combining these perceived work satisfaction factors and personality factors, this study gave rise to two new dimensions, where it was found that the ability to be an 'intrinsic analytical processor' is perceived to associate with effective workplace performance more significantly than being an 'extrinsic global processor' in the South African workplace.

As stated by Kotter (2007), in a dynamic and changing world, it has become vital to be able to 'lead change', which can only be done when individuals within an organization are well prepared for the change even before it occurs through constant learning, engagement, the consistent ability to adapt and to perform effectively through the occurrence of change, which requires the harmonious

interplay of internal and external factors as established through this and previous research.

As accounted for by Cassidy (2004), the impact and associations that learning style has to learning as well as performance has become increasingly relevant both in education as well as in the workplace. Research in the area of learning style has been conducted in areas of work including medical and health care training, management, industry, vocational training and other settings, thus showing that its application is relevant in every context. The centrality of learning or training and development in all areas of work and not only in the education sector itself is the reason that the applications of these concepts are so wide ranging and relevant. Moreover, it is all factors encompassing personal work satisfaction together with an individual's predisposing personality traits that renders an individual as more of an 'analytical processor' or a 'global processor'.

Therefore, determining the impact of individual experiential learning on a sustainable competitive advantage of an organization, the role of individual learning preferences and knowing the ways in which individuals within organizations best learn and work in relation to their vocations, professions and different conceptual and contextual roles as we understand it is essential as laid down in this study, based on even older previous theoretical frameworks.

In conclusion, the findings of this dissertation is indicative of a South African workplace context where individuals share the perception that effective workplace performance is contingent on having competent, process-driven and autonomous employees who are self-motivated and able to assertively apply logical reasoning within the workplace, thus possessing an amenable combination of 'analytical processing' and 'global processing' qualities.

6.4 Recommendations to organizations

Recommendations in this section refer to organizations such as hospital and healthcare institutions, pharmaceutical companies, management consulting firms, accounting firms, auditing firms, educational institutions (primary, secondary and tertiary), law practices, all of which have been surveyed in this research study. Based on the outcomes of this research, several recommendations can be made to managers, organizational decision-makers and strategists.

Insight into employee learning preferences benefit organizations and could add value in knowing the ways in which employees learn, work and perform in different roles and environments that are suitable to them so as to position them within departments accordingly. Knowing the learning styles of employees or the dominant learning styles in a particular workplace environment can help employees achieve better work performance outcomes, skills development and growth within organizations. The intrinsic and extrinsic factors of a workplace environment could be influenced positively through knowing the way in which employees are professionally inclined, competent and skilled at and what they gain the most motivation and enjoyment from in their work environment. This information can be vital in shaping the workplace to raise self-perceived employee satisfaction and thus encourage employee work performance effectiveness within the department or organization.

Every workplace has some form of training, coaching, mentoring and knowledge-advancing system in place, which could then be tailored by the company to align to employee needs and to plan effective methods and effective instruction. Fostering critical and creative thinking by creating a motivation to learn is key through learning styles and can be immensely effective for individuals with learning disabilities or disorders (Aisami, 2015). Team-based work or project collaborations can be optimized by teaming and grouping employees suitably matched to each other as well as selecting employees who would be well

equipped to handle and excel at the type of work entailed within the project. Thus, this study could contribute to several project management decisions.

With the advancement of technology, technology-intensive work tasks and the use of technology in the workplace, it is imperative that the learning style preferences of employees match that of the workplace for high quality matching performance, especially with an increasing need for visual competencies and technology-related skills in our high volume information age. This could provide significance to both the human resources recruitment selection process as well as the employee development process of the company, where employees may need to be upskilled and helped to adapt their individual learning style preferences in the workplace. E-learning and training systems in the workplace can be meaningfully personalized for the employees using them by using recommender agents for example and by influencing instructional system design (ISD). Technological design has been shown to play a significant role in individual perceived satisfaction, and since perceived satisfaction is a key dimension of the association between learning style and workplace performance, it is important to make technological design of technology used in the workplace useful for the user, easy to use, simple enough to understand and pragmatic enough to teach.

This study has therefore provided guidance to management in the domain of organizational psychology on several levels on how it is imperative to know the way best employees in the workplace learn, retain and use their knowledge and skills and show competence within an organization. This is important knowledge in creating a work environment that is conducive to employee learning styles, provide resources and learning tools to foster effective habits, interests and experiential learning for effective and competent work performance, and not to just use a ‘one size fits all’ approach to workplace learning in order to optimize workplace performance effectiveness and maintain a sustainable competitive advantage or yet a sustainable means of having a transient advantage in our modern global age (McGrath, 2013). As per the modern strategist McGrath

(2013, p. 1), “leaders in these businesses can compete effectively, but not by sticking to the same old playbook”, which necessitates constant learning.

6.5 Suggestions for further research

There is much potential for further research in this area of study and within organizational psychology itself. Experiential learning has been studied extensively by Kolb whose theory has been the basis of this study and has been applied to the workplace context. Through this research study, a lot has been learnt on the impact of several factors on learning style or ‘work style’ in the workplace context, and how these factors associate with workplace performance effectiveness as well, rather than just being confined to the educational or academic performance context. This study looked at the underlying dimensions that associate individual learning styles to workplace performance and the types of associations which exist between the two constructs.

6.5.1 The effect of dependent variables (demographic factors) on workplace learning using a learning style framework:

Further study can be done using Kolb’s learning style framework as used in this study that looks at individual perceiving and processing ability or another learning style framework such as the Index of Learning Styles (ILS) by Felder and Soloman (1991) that looks at information processing or the Honey and Mumford’s Learning Styles Questionnaire by Honey and Mumford (1992) that assesses personality effects. Further studies that associate with the subject topic covered in this study could be conducted by assessing the effects of more dependent variables to the learning style model. This would be with the aim of assessing specific differences in individual ‘learning/work styles’ and whether certain controllable variables such as work position and profession impact individual learning style and how. The study could delve into how learning styles and its association to workplace performance effectiveness actually differs across

professional fields, different work environments, and work roles or positions, as it has been postulated by Kolb (1984) that people in similar fields and professional domains and work environments adopt a similar learning style.

Other demographic factors such as gender or age can be used to determine whether differences occur in each set of factors, thus this could be an additional proposition to be tested (Severiens & Dam, 1997). Differences between men and women's learning styles in the work place and what can be done to close these gaps or best utilize them could be a beneficial subject of further research, as the natural abilities, learning preferences and role inclinations of men and women poses an interesting subject to tackle in the present day South African work context. The impact of differences in men's and women's learning styles and the impact it has on work placements, managerial decisions and individual's growth paths within the organization are further questions that could be answered by tackling a sub-problem on gender.

6.5.2 Learning styles in individuals with learning challenges

Further studies can be done on factors inhibiting or preventing the association between learning styles and effective workplace performance as this cannot be assumed. Learning challenges, disorders or disabilities and related factors may pose hindrances between an individual's learning style and the way they can apply this to their work performance. Therefore, fostering critical and creative thinking by creating a motivation to learn is key through learning styles and can be immensely effective for individuals with learning disabilities such as agenesis of the corpus callosum (Aisami, 2015).The impact of this on how workplaces are or can become strategically fitted and adaptive to its employees learning styles can be measured, and the extent of it, in terms of the environment, work processes, use of human capital, employee selection for roles and workplace team dynamics. This can be done with the aim to improve employee productivity and performance effectiveness within the workplace environment.

6.5.3 The evolution or change of an individual's learning style through their career

Since learning styles are dynamic, changes in individual learning styles through work trajectory as has been looked at by Stutsky, Laschmger, and Heather (1995) can be further studied within the workplace. A qualitative study can be conducted, where workplaces can be interviewed to find out what South African organizations are actually doing to help their employees become more adaptable and in sync with changes in trends and technological advances and whether workplaces have structured programmes as part of the workplace and what the factors that cause resistance or hinder individual development and learning within South African organizations, and how this can be changed so that South African organizations can maintain a competitive or transient advantage in a global work scheme. Several different organizational specific themes as well as common themes would be expected to arise from South African organizations. Most workplaces have induction programmes to introduce and aboard new employees to the organization. The effectiveness of these programs in accustoming employees individual learning styles to the work style of the organization can also be studied, as many struggle getting used to the way their companies do things.

Not much focus in past or recent research has been placed on the importance of individual learning or learning styles in specific relation to workplace learning, and more specifically within the South African workplace context that focuses on differences in individual workplace learning preferences within professional specializations and role changes. It has been understood that workplace learning styles is very much a subject of workplace psychology. It is important to quickly adapt and develop a way or style of learning within a particular organization and area of work as employees frequently change professional roles during their career trajectory (Brunken et al., 2003). However, there is a gradual but apparent change in work organizations today that has become more flexible and not governed by strict protocols, standard processes and procedures, which allows

employees to think, create, process and work in the best way conducive to their learning and working style. Therefore, these tend to change and adapt through an individual's professional career.

Some companies have the liberty of doing this, whereas other firms may require a rigid and more structured approach to working. Thus, being aware of one's own learning style and the association it has to one's profession and effective work performance is key in an individual's work choices. However, it is also a very important aspect for management within organizations to consider, as it is perceived satisfaction that has been identified in this study as a key factor associating ones learning style to one's effective work performance.

The purpose of this and future studies in this area would be to understand the impact of individual learning styles in the workplace or work styles on how workplaces are or can become strategically fitted and adaptive to its employees learning styles. It also dictates how its extent can be measured in terms of the employee himself (self-efficacy/competence, anxiety, learning style), the learning environment (design, diversity, interaction), work processes (flexibility, quality, technology), the selection and optimum channelling and use of human capital, (employee selection for roles and workplace team dynamics) (Mansfield, 1996). This can be done with the aim to improve employee productivity and performance effectiveness within the workplace environment, which essentially serves as the basis of the strength, agility, and transient advantage of a successful organization.

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APPENDIX A: Letter to Respondents

Dear Respondent

An MBA Research Study based on Learning Styles and Performance Effectiveness will be conducted by Bhavisha Bhoola who is a graduate of the Wits Business School. The researchers contact details are:

Full Name: Bhavisha Bhoola

Tel (c): +27 826320566

Email: bhavishab2706@gmail.com

The research can be confirmed by the research supervisor:

Professor Anthony Stacey

Email: Anthony.Stacey@wits.ac.za.

Purpose of the questionnaire:

The questionnaire that will be sent out is designed to evaluate your learning style preferences and to evaluate the effectiveness of your work performance based on a certain set of criteria. Your participation in this survey is voluntary and may be terminated or resumed at any time you choose.

Your identity will be treated with anonymity and all disclosed information will be treated with complete care and maintaining full confidentiality.

Upon completion and submission of this questionnaire, the researcher will provide you with the relevant feedback.

Thank you for choosing to contribute to this research study by taking the time to complete the three-part questionnaire.

The questionnaire is divided into the following three parts:

Part 1: Demographic Questionnaire

Part 2: Assessment of Learning Style preferences

Part 3: Assessment of Self-Perceived Work Performance Effectiveness

Please complete the excel spreadsheet and return to the researcher. This is merely for purposes of controlling the research sample required to complete the research. The survey will be sent out within the next one to two months.

Thank you for your participation.

Bhavisha Bhoola & supervising professor, Anthony Stacey.

APPENDIX B: Research Instrument / Research Questionnaire

Learning Styles and Performance Effectiveness Questionnaire

Your participation in this survey is very much appreciated and is completely voluntary. Your identity will be treated with anonymity and all disclosed information will be treated with complete care, maintaining full confidentiality. Continuing with this survey conveys your informed consent.

The researchers contact details are:

Name: Bhavisha Bhoola

Email: 360638@students.wits.ac.za

The research can be confirmed by the research supervisor.

Name: Professor Anthony Stacey.

Email: Anthony.Stacey@wits.ac.za

Please read the instructions carefully and answer each of the 15 questions as best you can.

Part 1

Please complete the following questions about yourself. (This information is required to describe the population sample that is being researched and for no other purpose):

Q1 What type of organization do you work for? (Select the most suitable option)

- ❍ Insurance company (1)
- ❍ Law firm (2)
- ❍ Management Consultancy firm (3)
- ❍ Non-government organization (4)
- ❍ Private Hospital (5)
- ❍ Bank (6)
- ❍ Pharmaceutical company (7)
- ❍ University or academic institution (9)
- ❍ Accounting firm (8)
- ❍ Chemical company (11)
- ❍ Self-employed/Entrepreneurial (12)

Q2 What type of position do you hold at your current job? (Select the most suitable option)

- ❍ Managerial (1)
- ❍ Technical (2)
- ❍ Administrative (3)
- ❍ Customer service (4)
- ❍ Consultancy (5)
- ❍ Supportive (7)

Q3 What is your highest qualification? (Select the most suitable option)

- ❍ Matric (1)
- ❍ Higher certification (2)
- ❍ Diploma (3)
- ❍ Bachelor's degree (4)
- ❍ Honours degree (5)
- ❍ Postgraduate/Higher degree (6)

Q4 What is your career field or profession? (Select the most suitable option)

- ❍ Engineering (1)
- ❍ Accountancy (2)
- ❍ Healthcare (3)
- ❍ Education/Training (4)
- ❍ Sciences (5)
- ❍ Economics/Commerce (6)
- ❍ Law (7)
- ❍ Management (8)
- ❍ Other (please specify in space below) (9)

Q5 How many years of full time work experience do you have?

- ❍ Less than 3 years (1)
- ❍ 3 to 5 years (2)
- ❍ 6 to 10 years (3)
- ❍ 11 to 15 years (4)
- ❍ More than 15 years (5)

Q6 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Q7 What age category do you fall in?

- ❍ 18 to 29 years (1)
- ❍ 30 to 39 years (2)
- ❍ 40 to 49 years (3)
- ❍ 50 to 59 years (4)
- ❍ Greater than 60 years (5)

Part 2

Q8 Please rate each of the following statements according to how you learn best. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job or workplace.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
When I learn I like to be doing things. (1)	❍	❍	❍	❍	❍	❍	❍
When I learn I like to watch, observe and listen. (2)	❍	❍	❍	❍	❍	❍	❍
I learn best when I rely on logical thinking. (3)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I learn best when I trust my hunches and feelings. (4)	❍	❍	❍	❍	❍	❍	❍
I learn best when I work hard to get things done. (5)	❍	❍	❍	❍	❍	❍	❍
When I am learning, I am responsible about things. (6)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
When I am learning I have strong feelings and reactions. (7)	❍	❍	❍	❍	❍	❍	❍
When I learn, I look at all sides and aspects of issues. (8)	❍	❍	❍	❍	❍	❍	❍

Q9 Please rate each of the following statements according to how you learn best. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job or workplace.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
When I learn, I like to analyse things and break them down into parts to understand them. (9)	❍	❍	❍	❍	❍	❍	❍
When I am learning, I am an active person. (10)	❍	❍	❍	❍	❍	❍	❍
When I am learning, I am an intuitive person. (11)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I learn best from rational theories. (12)	❍	❍	❍	❍	❍	❍	❍
When I learn I like to learn from ideas, concepts and theories. (13)	❍	❍	❍	❍	❍	❍	❍
When I learn I take my time before acting or doing. (14)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
When I learn I feel personally involved in what I'm doing. (15)	❍	❍	❍	❍	❍	❍	❍
I learn best when I rely on what I observe. (16)	❍	❍	❍	❍	❍	❍	❍

Q10 Please rate each of the following statements according to how you learn best. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job or workplace.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I learn best when I rely on my feelings. (17)	❍	❍	❍	❍	❍	❍	❍
I learn best when I can try things out for myself. (18)	❍	❍	❍	❍	❍	❍	❍
When I am learning I am a reserved person. (19)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I learn best when I am receptive and open-minded. (20)	❍	❍	❍	❍	❍	❍	❍
I learn best when I am careful (21)	❍	❍	❍	❍	❍	❍	❍
I learn best when I am practical. (22)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
When I learn I evaluate things. (23)	❍	❍	❍	❍	❍	❍	❍
I learn best when I analyze ideas and concepts. (24)	❍	❍	❍	❍	❍	❍	❍

Q11 Please select your level of agreement to the following sentences as to how best they apply to you. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I apply creative thinking, and different ways of performing everyday jobs. (1)	❍	❍	❍	❍	❍	❍	❍
I communicate my ideas and thinking in a way people understand. (2)	❍	❍	❍	❍	❍	❍	❍
I understand people's emotions and engage with them accordingly. (3)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I think and apply myself in a scientific and systematic way in my daily work. (4)	❍	❍	❍	❍	❍	❍	❍
I am involved in investigation and research studying as part of my work. (6)	❍	❍	❍	❍	❍	❍	❍

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I am involved in work that is calculated, mathematical and requires precision. (5)	❍	❍	❍	❍	❍	❍	❍

Part 3

Q12 Please rate how good or effective you think you are at the following tasks. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job.

	Very Ineffective (1)	Ineffective (2)	Somewhat Ineffective (3)	Neither Effective nor Ineffective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Technology-intensive tasks. (1)	❍	❍	❍	❍	❍	❍	❍
Sales, customer or social service tasks. (2)	❍	❍	❍	❍	❍	❍	❍
Actively engaging in supporting and teaching others. (3)	❍	❍	❍	❍	❍	❍	❍

	Very Ineffective (1)	Ineffective (2)	Somewhat Ineffective (3)	Neither Effective nor Ineffective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Personal jobs such as counselling & establishing personal relationships with others. (4)	❍	❍	❍	❍	❍	❍	❍
Information jobs such as planning and research, data gathering and analysis. (5)	❍	❍	❍	❍	❍	❍	❍

	Very Ineffective (1)	Ineffective (2)	Somewhat Ineffective (3)	Neither Effective nor Ineffective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Quality assurance jobs, continuous professional development and measuring performance outcomes. (21)	❍	❍	❍	❍	❍	❍	❍

Q13 Please rate how good or effective you think you are at the following skills. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job.

	Very Ineffective (2)	Ineffective (3)	Somewhat Ineffective (4)	Neither Effective nor Ineffective (5)	Somewhat Effective (6)	Effective (7)	Very Effective (8)
Valuing skills: Building relationships and helping others. (1)	❍	❍	❍	❍	❍	❍	❍
Thinking skills: Information gathering, information analysis, and theory or concept building. (2)	❍	❍	❍	❍	❍	❍	❍

	Very Ineffective (2)	Ineffective (3)	Somewhat Ineffective (4)	Neither Effective nor Ineffective (5)	Somewhat Effective (6)	Effective (7)	Very Effective (8)
Decision skills: Quantitative analysis, use of technology, and goal setting. (3)	❍	❍	❍	❍	❍	❍	❍
Acting or execution skills: Leadership, initiative, and acting out tasks. (4)	❍	❍	❍	❍	❍	❍	❍

	Very Ineffective (2)	Ineffective (3)	Somewhat Ineffective (4)	Neither Effective nor Ineffective (5)	Somewhat Effective (6)	Effective (7)	Very Effective (8)
Problem solving skills: Insight into processes by tackling and solving problems. (5)	❍	❍	❍	❍	❍	❍	❍
Instinct & networking skills: Open lateral overview and foresight for planning ahead. (6)	❍	❍	❍	❍	❍	❍	❍

Q14 Please rate how good or effective you think you are at the following tasks. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job.

	Very Ineffective (8)	Ineffective (2)	Somewhat Ineffective (3)	Neither Effective nor Ineffective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Pro-activeness, accomplishing tasks spontaneously and making uncertain decisions. (1)	❍	❍	❍	❍	❍	❍	❍
Learning not to repeat previous mistakes and misjudgements when encountering a similar situation. (2)	❍	❍	❍	❍	❍	❍	❍

	Very Ineffective (8)	Ineffective (2)	Somewhat Ineffective (3)	Neither Effective nor Ineffective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Self-education at work and out of work for self-awareness and development. (3)	❍	❍	❍	❍	❍	❍	❍
Practicing your personal values and beliefs of honesty and loyalty. (4)	❍	❍	❍	❍	❍	❍	❍

	Very Ineffective (8)	Ineffective (2)	Somewhat Ineffective (3)	Neither Effective nor Ineffective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Applying your training and knowledge of concepts to performing practical work situations. (5)	❍	❍	❍	❍	❍	❍	❍
Engaging in formal training methods (i.e. Lecture type, presentations, computer-based or video-tape material). (6)	❍	❍	❍	❍	❍	❍	❍

Q15 Please rate how good or effective you think you are at the following tasks. To help you answer the questions, try to recall some recent situation where you had to learn something new in your job.

	Very Ineffective (1)	Ineffective (2)	Somewhat Ineffective (3)	Neither Ineffective nor Effective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Engaging in collaboration, communicating with an expert, and engaging in coaching and mentoring interactions. (2)	❍	❍	❍	❍	❍	❍	❍
Being an advocate for colleagues by motivating them and encouraging their ideas. (3)	❍	❍	❍	❍	❍	❍	❍

	Very Ineffective (1)	Ineffective (2)	Somewhat Ineffective (3)	Neither Ineffective nor Effective (4)	Somewhat Effective (5)	Effective (6)	Very Effective (7)
Offering leadership to other individuals or teams. (4)	❍	❍	❍	❍	❍	❍	❍

This is the end of the questionnaire. Thank you for having completed this questionnaire. Your time given in contributing to this research is much appreciated. Thank you.

APPENDIX C: Kolb's Learning Style Inventory (KLSI) Version 3, Cycle and Grid

C1. KLSI Version 3:

Table 12: Table of Kolb's Learning Style Inventory (KLSI) 3 sourced and created from the following attached document of Kolb's original Learning Style Inventory

	A		B		C		D	
1. When I learn		I like to deal with my feelings		I like to think about ideas		I like to be doings things		I like to watch and listen
2. I learn best when		I listen and watch carefully		I rely on logical thinking		I trust my hunches and feelings		I work hard to get things done
3. When I am learning		I tend to reason things out		I am responsible about things		I am quiet and reserved		I have strong feelings and reactions
4. I learn by		Feeling		Doing		Watching		Thinking
5. When I learn		I am open to new experiences		I look at all sides of issues		I like to analyse things, break them down into their parts		I like to try out things
6. When I am learning		I am an observing person		I am an active person		I am an intuitive person		I am a logical person
7. I learn best from		Observation		Personal relationships		Rational theories		A chance to try out and practice
8. When I learn		I like to see results from my work		I like ideas and theories		I take my time before acting		I feel personally involved in things
9. I learn best when		I rely on my observations		I rely on my feelings		I can try things out for myself		I rely on my ideas
10 When I am learning		I am a reserved person		I am an accepting person		I am a responsible person		I am a rational person
11. When I learn		I get involved		I like to observe		I evaluate things		I like to be active
12. I learn best		I analyse ideas		I am receptive and open-minded		I am careful		I am practical

C2. Kolb’s Learning Style Inventory, Cycle & Grid:

LEARNING-STYLE INVENTORY

The Learning-Style Inventory describes the way you learn and how you deal with ideas and day-to-day situations in your life. Below are 12 sentences with a choice of endings. Rank the endings for each sentence according to how well ou think each one fits with how you would go about learning something. Try to recall some recent situations where you had to learn something new, perhaps in your job or at school. Then, using the spaces provided, rank a "4" for the sentence ending that describes how you learn best, down to a "1" for the sentence ending that seems least like the way you learn. Be sure to rank all the endings for each sentence unit. Please do not make ties.

Example of completed sentence set:

1. When I learn: 2 I am happy. 1 I am fast. 3 I am logical. 4 I am careful.

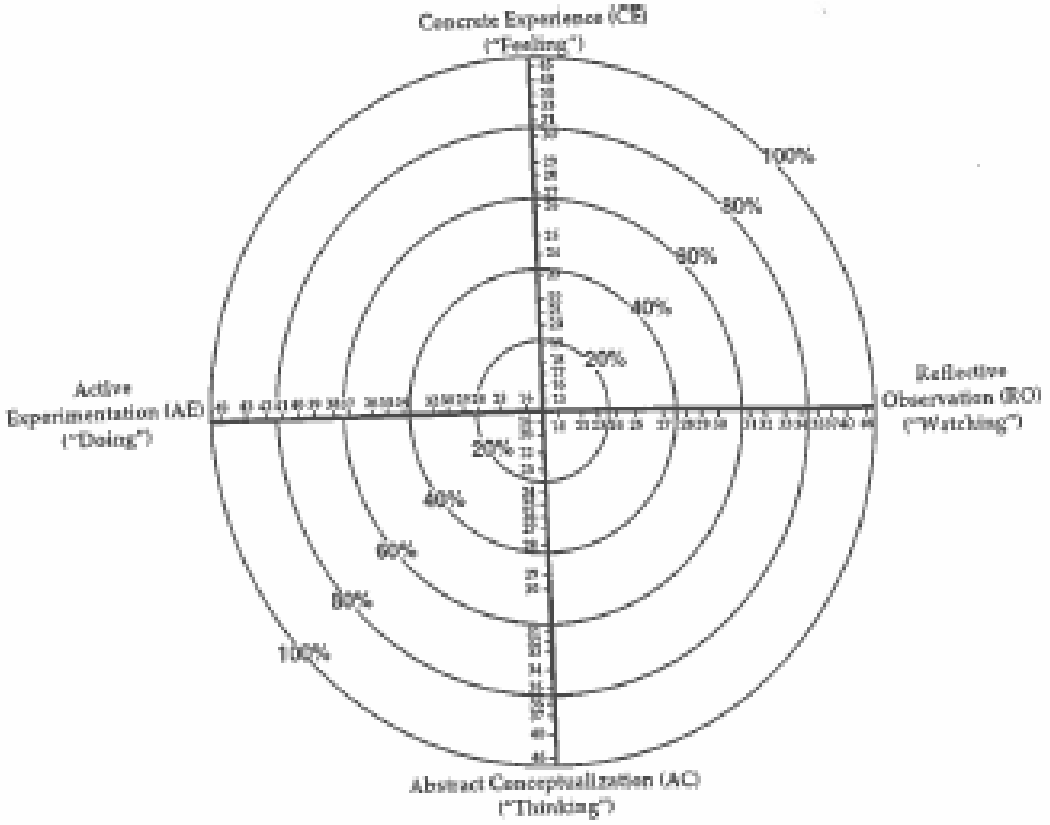
Remember: 4 = *most* like you 3 = *second most* like you 2 = *third most* like you 1 = *least* like you

	A		B		C		D	
1. When I learn:	___	I like to deal with my feelings.	1	I like to think about ideas.	___	I like to be doing things.	___	I like to watch and listen.
2. I learn best when:	___	I listen and watch carefully.	___	I rely on logical thinking.	___	I trust my hunches and feelings.	___	I work hard to get things done.
3. When I am learning:	___	I tend to reason things out.	___	I am responsible about things.	___	I am quiet and reserved.	___	I have strong feelings and reactions.
4. I learn by:	___	feeling.	___	doing.	___	watching.	___	thinking.
5. When I learn:	___	I am open to new experiences.	___	I look at all sides of issues.	___	I like to analyze things, break them down into their parts.	___	I like to try things out.
6. When I am learning:	___	I am an observing person.	___	I am an active person.	___	I am an intuitive person.	___	I am a logical person.
7. I learn best from:	___	observation.	___	personal relationships.	___	rational theories.	___	a chance to try out and practice.
8. When I learn:	___	I like to see results from my work.	___	I like ideas and theories.	___	I take my time before acting.	___	I feel personally involved in things.
9. I learn best when:	___	I rely on my observations.	___	I rely on my feelings.	___	I can try things out for myself.	___	I rely on my ideas.
10. When I am learning:	___	I am a reserved person.	___	I am an accepting person.	___	I am a responsible person.	___	I am a rational person.
11. When I learn:	___	I get involved.	___	I like to observe.	___	I evaluate things.	___	I like to be active.
12. I learn best when:	___	I analyze ideas.	___	I am receptive and oper-minded.	___	I am careful.	___	I am practical.

LCB200C

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THE CYCLE OF LEARNING

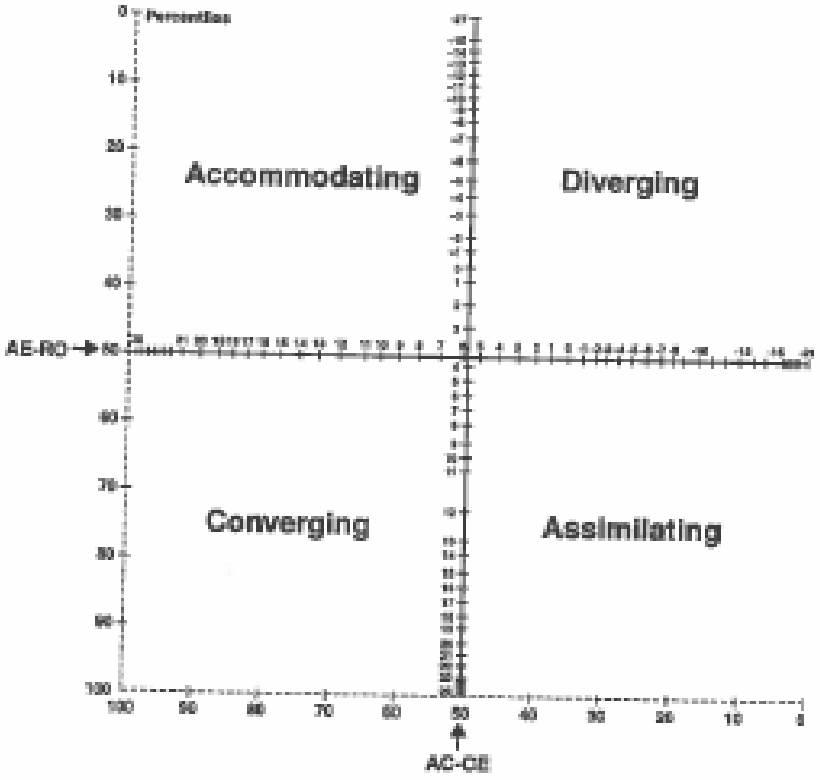


1A	2C	3D	4A	5A	6C	7B	8D	9B	10B	11A	12B	=	CE Total
1D	2A	3C	4C	5B	6A	7A	8C	9A	10A	11B	12C	=	RO Total
1B	2B	3A	4D	5C	6D	7C	8B	9D	10D	11C	12A	=	AC Total
1C	2D	3B	4B	5D	6B	7D	8A	9C	10C	11D	12D	=	AE Total

NCB200D

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LEARNING-STYLE TYPE GRID



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APPENDIX D: Tables of Results showing Unrotated Factor Loadings

Table 13: Unrotated Factor Loadings of Learning Style items

Learning Style Item	Unrotated Factor Loadings	
When I learn I like to be doing things.	0.1622	0.1504
When I learn I like to watch, observe and listen.	0.2346	-0.2617
I learn best when I rely on logical thinking.	0.2002	0.2094
I learn best when I trust my hunches and feelings.	0.1988	-0.3215
I learn best when I work hard to get things done.	0.1883	0.2945
When I am learning, I am responsible about things.	0.2320	0.1396
When I am learning I have strong feelings and reactions.	0.1928	0.0039
When I learn, I look at all sides and aspects of issues.	0.3514	0.1981
When I learn, I like to analyse things and break them down into parts to understand them.	0.2536	0.1248
When I am learning, I am an active person.	0.1053	-0.0147
When I am learning, I am an intuitive person.	0.2728	0.1339
I learn best from rational theories.	0.1983	-0.1826
When I learn I like to learn from ideas, concepts and theories.	0.2122	-0.3547
When I learn I take my time before acting or doing.	0.1757	-0.0592
When I learn I feel personally involved in what I'm doing.	0.2574	-0.0447
I learn best when I rely on what I observe.	0.0623	-0.3192
I learn best when I rely on my feelings.	0.0155	-0.3018
I learn best when I can try things out for myself.	0.1474	-0.0831
When I am learning I am a reserved person.	0.0377	0.2407
I learn best when I am receptive and open-minded.	0.1914	-0.3601
I learn best when I am careful	0.1812	0.0431
I learn best when I am practical.	0.1353	0.1161
When I learn I evaluate things.	0.2995	0.1210
I learn best when I analyze ideas and concepts.	0.2304	0.0195

Learning Style Item	Unrotated Factor Loadings	
I apply creative thinking, and different ways of performing everyday jobs.	0.2777	0.0174
I communicate my ideas and thinking in a way people understand.	0.1989	0.0004
I understand people's emotions and engage with them accordingly.	0.1934	-0.0570
I think and apply myself in a scientific and systematic way in my daily work.	0.2312	0.1070

Table 14: Unrotated Factor Loadings of Performance Effectiveness items

Performance Effectiveness Item	Unrotated Factor Loadings	
I am involved in work that is calculated, mathematical and requires precision.	0.2149	0.1045
I am involved in investigation and research studying as part of my work.	0.2261	0.1607
Technology-intensive tasks.	0.1557	0.1857
Sales, customer or social service tasks.	0.0654	-0.3063
Actively engaging in supporting and teaching others.	0.1507	-0.2088
Personal jobs such as counselling & establishing personal relationships with others.	0.1480	-0.2076
Information jobs such as planning and research, data gathering and analysis.	0.2200	0.2092
Quality assurance jobs, continuous professional development and measuring performance outcomes.	0.1488	0.1036
Valuing skills: Building relationships and helping others.	0.2034	-0.2576
Thinking skills: Information gathering, information analysis, and theory or concept building.	0.2107	0.1642
Decision skills: Quantitative analysis, use of technology, and goal setting.	0.1653	0.1842
Acting or execution skills: Leadership, initiative, and acting out tasks.	0.1538	0.0257
Problem solving skills: Insight Into processes by tackling and solving problems.	0.1874	0.2671

Performance Effectiveness Item	Unrotated Factor Loadings	
Instinct & networking skills: Open lateral overview and foresight for planning ahead.	0.1660	0.0275
Pro-activeness, accomplishing tasks spontaneously and making uncertain decisions.	0.2285	-0.2400
Learning not to repeat previous mistakes and misjudgements when encountering a similar situation.	0.2195	-0.0315
Self-education at work and out of work for self-awareness and development.	0.1993	0.1556
Practicing your personal values and beliefs of honesty and loyalty.	0.1901	-0.0087
Applying your training and knowledge of concepts to performing practical work situations.	0.2173	0.2186
Engaging in formal training methods (i.e. Lecture type, presentations, computer-based or video-tape material).	0.1456	0.0951
Engaging in collaboration, communicating with an expert, and engaging in coaching and mentoring interactions.	0.1604	-0.3190
Being an advocate for colleagues by motivating them and encouraging their ideas.	0.1927	-0.4096
Offering leadership to other individuals or teams.	0.2110	-0.2637