An Examination of the Learning styles of Saudi Preparatory School Students who are High or Low in Reading Achievement

By

Ibrahim Abdu Saadi

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School of Education

Faculty of Arts, Education, and Human Development

Victoria University

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DECLARATION

I, Ibrahim Abdu Saadi, declare that the PhD thesis entitled, an examination of the learning styles of Saudi preparatory school students high and low in reading achievement is no more than 100,000 words in length, including quotes and exclusive of tables, figures, appendices, bibliography, references, and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature

ABSTRACT

This study examined the learning styles and reading achievement characteristics of Saudi Arabian preparatory schools students. The key aim of the research is to provide additional information regarding teaching and learning that warrant consideration in the continuing efforts to improve the reading skills of Saudi school students. The sample comprised Arabic language teachers and grade seven and eight students in Jeddah City. Students completed the VARK younger version questionnaire and the Teaching Reading Strategies Questionnaire (TRSQ). Teachers also completed the teacher version of the TRSQ and the Reading Achievement Assessment Form (RAAF). A pilot study was conducted to examine the reliability of all measures following translation into the Arabic language. The main study was conducted in three phases of data collection. In the first phase 16 teachers used the RAAF to assess the reading achievement of 602 students and also provided the researcher with these students' reading scores for the first term (FT) of 16 weeks. A cohort of 399 students was selected on the basis of their achievement in reading (high or low) to participate in the second phase of study. They responded to the TRSQ (students form) and the VARK to determine the reading teaching strategies they prefer and their preferred learning styles. In the last phase, the 16 teachers completed the TRSQ to detail the teaching strategies they typically adopt in their teaching of reading.

Resultant data indicated students from both the high and low reading achievement groups typically preferred multimodal learning styles (quad, tri and Bi). Students in the low group preferred the kinaesthetic style as a single mode style. Results of the chi square analyses highlighted significant differences in the frequencies of the VARK seven group (VARK7G) learning style classifications for the high and low reading achievement groups within the grade seven male student cohorts. The MANOVA results also showed significant effects for grade, gender, interaction of gender and grade, interaction of gender and

VARK7G, and interaction of gender and multiple and single learning style preferences on the RAAF scores of all students. The post hoc tests for the male group highlighted significant differences in the RAAF scores between students on the basis of their preferred learning style. A significant chi square relationship was found in regards to students' preference for a multimodal or single mode learning style. Although, both genders had an overall stronger preference for multimodal, the females demonstrated a significantly higher preference for the single mode learning style. In addition, significant correlations were found between reading achievement (RAAF and FT) and the teaching reading strategies subscales of reading instruction, reading recourse and reading activities. Hierarchical multiple regression analyses revealed that several teaching reading strategies were significant predictors of reading achievement. Finally, chi square analysis indicated a significant difference in the frequencies of the VARK7G categories for the TRSQ reading activities subscale. In conclusion, learning styles are considered as a factor that may affects students' reading achievement. Overall, the reading curriculum in Saudi education system should be designed to take into account different learning styles in order to satisfy the students need.

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DEDICATION

إلي ذكرى والدي الغالي أهدي هذا الجهد المتواضع

عرفاناً مني بفضله بعد الله فيما وصلت إليه

I dedicate this thesis to honor the memory of my beloved father

Whom I extremely owe a debt of gratitude; after the will of God (Allah) almighty, for all achievements I made.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

TABLE OF APPENDICES

Chapter 1: Introduction

Learning styles constitute the framework in which individuals acquire knowledge and use their preferred approaches to process information so that they will learn successfully. Larkin and Budny (2005) stated that a "learning style is a biologically and developmentally imposed set of personal characteristics that make the same teaching and learning methods effective for some and ineffective for others" (p. 1). Research has identified that certain people favour a singular (e.g., visual) mode of learning, while others tend to favour multiple modes of learning (e.g., auditory plus visual) (Fleming, 1995; Sarasin, 1998). The concept of learning style is useful for identifying and understanding the internal and external variations in how individuals learn and process information and in helping to improve their interaction within education environments (Foley, 1999). Learning styles have a real effect on the achievement of students. If learning styles are neglected, this may lead to a slowing in their educational improvement (Hilgerson-Volk, 1987). Price, Dunn and Sanders (1981) highlighted the importance of educators having an awareness of learning styles, stating:

> As we learn more and more about the scope and complexity of individual differences and how they affect academic progress, we become increasingly convinced that many individuals who do not read well do not because the instructional method used to teach them dose not complement their learning styles characteristics (p. 226).

Understanding learning styles could be considered as a key component of managing classroom teaching strategies (Jaeger, Freeman & Whalen, 2007). Data also demonstrated that older students were significantly different in their learning style preferences to younger students. Learning style differences based upon gender were observed, but were largely not significant (Littin, 2002). Caldwell and Ginther (1996) found that there are differences in the learning styles of low and high academic achievers from low socioeconomic backgrounds.

These findings suggest that learning styles are not only hereditary, but also environmentally determined.

Reading deficiency can impact on many areas of life, including on school performance (Simmons & Kameenui, 1998). Leong (1973) classified two groups of factors that can affect reading. The first are extrinsic factors or environmental factors, which include home conditions, socioeconomic status, parental attitudes toward education and parental aspirations for the child. The second group of factors are internal factors which operate within the child and affect his/her fulfilment in academic situations. The two groups of factors interact at the individual level. Konza (2006) indicated that students with reading difficulties feel indecisive, compared with fluent readers. Moreover, reading difficulties result in academic problems across the curriculum.

The link between learning style and reading achievement has been investigated by many researchers (e.g., Marrison & Frick, 1994; Smith & Holliday, 1986). In one study, the relationship between reading achievement and the diagnosed learning style preference for light was evaluated by Shaver (1985). The researcher controlled the light to match students learning styles, which resulted in a significant increase in reading achievement. Shaver also found students whose preference for light was matched with their learning style achieved significantly higher composite scores on tests of speed reading. Moley (1980) found that the global learning style of the field dependent reader is more successful than the analytic learning style, regardless of the reading teaching strategy being used. Moley found that the analytic type student learns more words when a combination of whole-word and phonics strategies is used, whereas the global learning style students learned more words when the phonics approach was used. Therefore, learning style can be considered as a significant factor of students reading achievement.

Staplin (1984) found some relationships between learning styles and reading achievement that did not indicate whether the gender or grade level of the student had any consistent relationship with their scores on the reading skills component of the Iowa Test of Basic Skills (ITBS). He also found that a significant interaction had occurred at the level between gender and grade in reading for generalizations. Weinberg (1983) reported that third grade students who were visual and tactual-kinaesthetic learners achieved better when taught through their perceptual modalities. Brooks (1991) suggested "teaching to identified learning styles of remedial readers, does improve their oral and silent reading comprehension" (p. i).

According to Carbo, Dunn and Dunn (1986), those children who have struggled to achieve academically were not taught according to their preferred individual learning styles. Foley (1999) identified that the reading achievement of third grade students was affected by whether or not their learning style preferences "matched" or did not match the learning style preferences of their teacher, which may have had an effect on student achievement. In addition, Eitington (1989) differentiated between high and low reading achievement with regard to seven learning style variables. These are: preferring visual learning, learning in a variety of ways, having an orientation towards authority, needing structure and learning in an auditor, tactile or kinaesthetic way. Eitington indicated that participants with low reading achievements were more likely to prefer visual learning.

There is agreement amongst learning theorists that curriculum and instructional strategies should be adapted to accommodate individual differences (Horton & Oakland, 1997; Sawyer, 2000). Several studies have investigated the relationship between learning styles and reading instruction methods. Stahl (1988) illustrated that teachers need different approaches to teach students to read, because learning styles indicate that different children differ in their phonemic abilities, in their ability to recognize words automatically, in their ability to comprehend and learn from the text, and in their motivation and appreciation of

literature. Schuman (1987) found that learning styles seem to have a definite impact on the acquisition of skills associated with learning to read. She noted that the teacher's inclusion of teaching strategies to accommodate learning styles is an important consideration in providing equal opportunities for the success of all students.

Statement of the Problem

Reading difficulties are common problems among school students. According to the American Federation of Teachers (2004), many students have difficulty in reading and writing; 20% of elementary students have real difficulties in learning how to read, while 20% have poor fluency. 25% of adults have limitations in the basic literacy skills which are required in a typical job. Indications of the prevalence of reading disorders can range from 8% to 10% of any population (Rey, De Martino, Espesser & Habib, 2002). In another study, the prevalence is reported as between 3% and 8% across countries and languages (Vicari, Marotta, Menghini, Molinari & Petrosoni, 2003). In Saudi Arabian schools, approximately 20% of students have reading difficulties (Hafiz, 2000). The previous literature indicated reading difficulties across nations in general and Saudi society in particular. In this case, reading problems are considered as a general problem which has motivated the researcher to explore the phenomenon.

Some studies have determined that there is a difference between learning style preferences in terms of gender (e.g., Dobson, 2009; Lincoln & Rademacher, 2006; Loo, 2002; Wehrwein, Lujan & DiCarlo, 2007). Loo (2002) suggested the differences in learning styles between genders required further investigation. A study by Wehrwein et al. (2007) showed that across four ethnic groups, female students have a higher preference for the kinaesthetic learning style, while male students were more tactile than female students. In contrast with these findings, Lincoln et al. (2006) revealed that female learners preferred to learn using their auditory senses, while male learners learn best when taking notes. While Dobson (2009) and

Kia, Aliapour and Ghaderi (2009) suggested that there is a relationship between gender and learning styles, certain researchers noted that there was no significant difference according to gender and learning styles performance (Cezair, 2005; Cornu, 1999; Slater, Lujan & DeCarlo, 2007; Sizemore & Schultz, 2005). Consequently, both the learning style and gender of a student must be taken into consideration in conducting further research into reading.

Learning styles seem to play a major role in academic achievements. Nolting (2002) emphasised that students' academic achievement positively increases if they are aware of their learning style and how they learn best. Many studies strongly suggested that there are relationships between certain learning styles and students' high academic achievements (Bahar, 2009; Collinson, 2000; Hlawaty, 2008; Wallace, 1992; Yazicilar & Guven, 2009). Inconsistent with later findings, McKee (1995) concluded that the relationship between learning styles and achievements is not noticeable. Moreover, Garton, Spain, Lamberson and Spiers (1999) found a low positive relationship between student learning styles and their achievements. Abdulkadir and Din (2006) revealed that there are no significant differences between high and low achievement groups in learning styles.

On the basis of recent high rates of reading problems reported amongst school students, and the presumed influence between learning styles, grade, gender, and reading achievements, the purpose of the current research is summarized below.

The Purpose of the Study

This study examines the relationship between learning styles and reading achievement in a cohort of Jeddah preparatory school students in Saudi Arabia. It is envisaged that there may be differences between high reading achievers and low reading achievers in their learning style preferences, and that those differences may play a crucial role in the students' academic difficulties. Results from this study will help improve and possibly lead to the modification of teaching strategies, which will play a positive role in countering low reading

achievement. The results of this study are also important for the continuing implementation of the assessment of learning styles in educational settings. If learning style is shown to have a positive impact on the learning outcomes of students, then it should be important to assess their preferred learning styles prior to starting a reading class. If specific reading teaching strategies reveal significant improvement in learning outcomes compared to other strategies for reading instruction, the study may lead to recommendations being made for developing a curriculum to prepare future teachers to master a wide variety of appropriate reading teaching strategies. Since it is the first time that this kind of research has been conducted with an Arabic speaking student group, the results may promote further research in the areas of learning styles and academic achievements.

Contribution to Knowledge

The research contributes to the theory of learning styles and extends prior research findings by drawing evidence from the Saudi educational field. It is an investigation of learning styles of students with high and low reading achievement. However, no study has previously examined the learning styles of high and low reading achievement preparatory students in Saudi society. This research seeks to address these dimensions and thus add to the current body of educational knowledge.

This study focuses on two key areas of importance: firstly, the research will make a contribution toward the theoretical understanding of the psycho-educational perspectives of learning styles. It should provide the educational field with additional information that contributes to an explanation of reading acquisition difficulties and provides Saudi educators with a learning styles profile. As a corollary, this study will classify students as visual, aural, read-write, kinaesthetic, bi-, tri-, and quad-model according to the VARK theory. The study will also highlight any differences between male and female learning styles within the Saudi preparatory school environment.

Secondly, in the applied context, the study will provide the field with additional strategies to develop teaching reading strategies that will help the lower achieving students. It will also assist the educator in designing their lessons in accordance with the students' preferred learning styles. The knowledge gained in this study will help Saudi educational leaders in managing and developing specific remedial reading programs on the basis of local research findings.

Organising the Thesis

This thesis is presented in six chapters. The first chapter introduced the statement of the problem and the purpose of the research. It also sets out the contribution of the study.

The second chapter consists of two sections reviewing the literature on learning styles and reading achievement for students in schools. The first section presents the concept of learning styles and the difference between learning styles and cognitive styles. Several learning style theories and instruments that are frequently used in the education field are outlined as well as the factors affecting learning styles. The relationship between learning styles and academic achievement in general, and reading achievement and teaching are shown. Furthermore, this section reviews the stability of learning styles. The second section in chapter two presents reading approaches, reading resources, reading skills, reading class activities, characteristics of good and poor readers and reading assessment. A brief survey of the literature on factors affecting reading achievement completes the chapter.

Chapter 3 presents an overview of the education system in Saudi Arabia. It includes a profile of the country and the most prominent features of Saudi education. The developmental education of boys and girls is described. Particular focus is first given to the preparatory schools stage and teacher preparation in Saudi Arabia, especially Arabic language teachers, before focusing on the strategies for teaching reading in the Saudi preparatory schools.

Chapter 4 reviews the definitions, importance and benefits of the pilot study undertaken as part of this research. The plan and aim of pilot study are both presented. Face and content validity of the questionnaires are demonstrated, as well as the methodology used, which consists of: sample, instruments, translation and verification of instruments, procedures of the pilot study and data analysis. Finally, the chapter outlines the results of the pilot study.

Chapter 5 presents the main study. It sets the research questions and hypotheses. It also outlines the methodology of the main study, including research design, description of the variables, sample, measures, main study data collection, data analysis and result. After that, the chapter presents the findings which are then discussed within the theoretical framework of the literature review.

Chapter 6 summarises the study's procedures and findings, sets the limitations of the study and provides conclusions. Based on the findings, the study offers recommendations for learning styles theory and practice. This chapter also outlines recommendations for the Ministry of Higher Education and Ministry of Education to consider. Suggestions for further research complete the thesis.

Summary

Understanding the variations of an individual's way of learning and processing information is based on the concept of learning style. Student achievements could be influenced negatively if the application of their preferred learning style is neglected. Reading skills are one of the educational basics that influenced by individual learning styles. Personal differences in learning style among students necessitate different approaches to teaching students to read. In Saudi Arabia, reading difficulty is considered as a general problem, since 20% of the students suffer from it.

Chapter 2: Literature Review

Many theorists advocate that students' preferred learning styles are the basis of effective learning (Dunn & Dunn, 1999). This concept of learning style originated in1954, with the seminal studies of Thelen (Keefe, 1987). This concept has subsequently increased in popularity, with teachers commonly advised to assess the particular learning styles of their students according to students' observed needs, and to select classroom methods that promote a good fit between students' learning styles and teaching methods. Sternberg and Zhang (2001) for example, point out that learners use vastly different techniques to learn depending on their learning styles.

As noted by the American Federation of Teachers (1999), reading is considered the basic skill upon which all formal education depends. Harris (2007) stated that when evaluating a nation's economy, literacy rates need to be considered as a demonstration of the importance of education in economic and social development, whereby literacy levels are representative of education levels. Understanding the learning style of students is therefore crucial to the development of reading skills. According to Snow, Burns and Griffin (1998) a common range of reading problems is usually spread across any one group of school children in any school.

This literature review is divided into two sections. The first section comprises an outline of learning styles and some definitions of key terms, including: the concept of learning style, learning styles and cognitive styles, learning style theories, learning style instruments, factors affecting learning styles, learning styles and academic achievement, learning styles and reading achievement and stability of learning styles. The second section is about reading and addresses approaches to teaching reading, reading resources, reading skills, students' reading activities, characteristics of good and poor readers, reading assessment and factors affecting reading achievement.

Learning Styles

Definitions of Terms

In this study, 'learning styles' refers to the methods that best suit an individual's preferences for receiving and expressing information. Felder and Silverman (1988) defined learning style as an individual's preferred way of acquiring, retaining and processing information. Foley (1999) defined learning styles as the unique behaviour of learners adapting to their environment. These definitions differ slightly from Keefe and Ferrell (1990) who saw learning styles as "the composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment" (p. 59). According to Curry (1981) learning styles relate to the differences in cognitive approaches and processes of individual students' learning.

The Fleming (2006) VARK model of learning proposes that learning is composed of four major styles: visual (V), aural (A), read/write (R) and kinaesthetic (K).

Visual (V) learners learn by seeing and watching information. Materna (2007) suggested that visual learners learn best by viewing information presented in formats such as demonstrations, videos, and films. Mayzler and McGann(2010) explained that the visual learner is the person who learns best when she or he is seeing the information - the brain absorbs the information best when the information is delivered through the eyes. Stash (2007) defined visual learners as people who prefer pictorial information.

Aural (A) learners report that audio information is their preferred presentation method. Kapp, Latham and Latham (2001) stated that the best ideal learning situation for aural students is when data is delivered through lectures, discussions, conversations in class or in a recorded format. Blerkom (2008) suggested that aural learners are unlike visual learners as they prefer to listen to lectures before reading lecture notes and they understand the

information most easily after listening and asking/answering questions out loud. Conroy (2007) indicated that:

> they have excellent listening skills, not only recalling what was said, but also having the ability to catch nuances in words, tone, inflection and overall meaning from the speaker. He often sings or talks to him or herself, repeating what he or she heard (p.54).

Read/write (R) learners, according to Fleming (2006) prefer information displayed as words, either read or written. His learning style theory subdivided the visual style into visual (iconic) and text (symbolic). Bastable (2008) stated that students who learn best using this style prefer the written word attained through reading or writing information. Nilson (2010) mentioned that read/write style students do better than others when asked to read and write, as they have a different memory structure and they store information as organized sets of symbols.

Kinaesthetic style (K) learners (also known as tactile learners) use body movements and bodily sensations to learn, Gerdy (2001) stated "students whose instructional preferences centre on activity are called tactile or kinaesthetic learners" (p. 80). Dreeben (2010) defined kinaesthetic style as having "to do with the physical experience of touching, feeling, holding, doing, and practical hand-on experience. The learner prefers kinaesthetic stimulation for learning to occur" (p. 219). Furthermore, Materna (2007) detailed that these students prefer hands-on activities such as experiments and practice, and they depend on self study techniques when they learn or recall information. Similarly, Lobb (2003) stated that movement is one of the requirements for a kinaesthetic learner. Guffanti (2009) described kinaesthetic students as learners who look deeply into the pieces of something and sense how they fit together.

The four styles outlined in the VARK model can be used individually (a single style such as visual learning) or combined (bi modal, tri modal and quad modal). A single learning

style is described as when the learner only uses one of the major styles to learn. This means the learners preferred learning styles is one out of visual (V), aural (A), read-write (R) or kinaesthetic (K).

In addition to the singular elements of the VARK model, individual learning styles can also be combined in various ways. Students who effectively use two learning styles to absorb information are bi-modal. According to Fleming (2006) in the VARK model a bi-modal student has two different learning preferences such as VA, VR, VK, AR, AK or RK.

Students who depend on three learning styles are tri-modal. In Fleming's VARK questionnaire, tri-modal students posess preferences such as VAR, VAK, VRK and ARK (Fleming, 2006).

Quad-modal students use all four learning styles. Fleming (2006) stated that the four styles have similar importance to these individuals when absorbing and outputting information.

Learners who use two or more styles to acquire information are called multimodal learners. This category includes bi-modal, tri-modal and quad-modal learners. Fleming (2006) reported that multimodal learners have no single preferred learning style, but prefer a combination of visual, aural, read-write and kinaesthetic. Within this thesis the VARK model will be used when discussing learning styles. However, this is not the only model to use when classifying learning. The following section aims to describe and evaluate various other theories about learning styles.

The Concept of Learning Style

The term "learning style" has been the topic of various research for more than five decades and is widely used in education and training. Slavin (2000) presented a simple example to describe learning style - if a person learns the names of the people they meet by writing it down and reading it, then they are visual learners, whereas if they learn by hearing

and saying the name then their learning style is auditory. However Suski (2002) indicated that there is no generally agreed definition for the term learning style.

Learning style refers to individual differences in approaches to learning based on preferences. Gregorc (1979) defined learning style as "distinctive behaviours which serve as indicators of how a person learns from and adapts to his environment. It also gives clues as to how a person's mind operates" (p. 234). Atkins, Moore, Sharpe and Hobbs (2001) proposed that students respond differently to learning situations because their responses are influenced by their thinking, experience, environment and current task. This approach is referred to as individual learning styles. According to Dunn, Beaudry & Klavas (2002) the term learning style may be considered to be formed on the basis of biological and developmental characteristics that include perceptual preferences, instructional environment preferences, sociological preferences, mobility needs and time of day preferences. Others stated that learning style refers to the simple preference of a method of how an individual learns and remembers a concept (Petrus-Vancea, 2009).

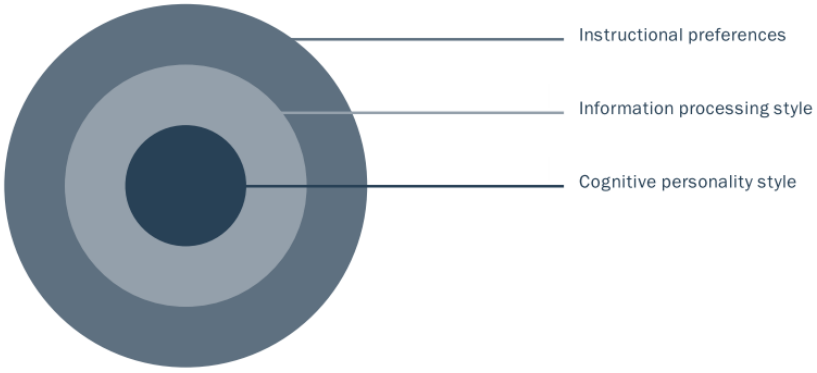
Learning styles can also refer to the methods used by a student to acquire and retain information. Learning style is also defined as a person's individually preferred method for best gathering data, processing it, and putting it to later use in terms of concrete experience, reflective observation, abstract conceptualization and active experimentation (Kolb, 1976). Reinert (1976) described an individual's learning style as "the way in which that person is programmed to learn most effectively i.e., to receive, understand, remember, and be able to use new information" (p. 161). Felder et al. (2002) described learning style as the way a learner acquires, retains and processes information. They defined the concept of learning style using a method of the information processing perspective that describes the unique individual approach of perceiving, encoding, storing and retrieving information.

Some learning style researchers connect the concept of learning style to individual personalities. Guild and Garger (1998) noted that learning style is a unique aspect of our humanity; it is the way we perceive the world and governs how we think, make judgments and form values about experiences and people. They noted that these basic and consistent personality traits influence many aspects of personal and professional behaviour, which if they affect learning, can be called learning styles. Riding and Rayner (1999) described learning style as a countenance of individuality consisting of qualities, activities or behaviours sustained over a period of time while. Jackson (2005) explained it as "reflecting the biological basis of personality and its modification by conscious processes" (p.5).

Another approach to learning style is based on a social psychology perspective that emphasises small group dynamics and role playing. Fuhrmann and Grasha (1983) described learning style as social interaction; it illustrates the different roles used by students in the classroom in interacting with their classmates, teachers and course content. This view is consistent with Jonassen and Barbra (1993) who outlined that learning style is a preferred educational or instructional activity to absorb and process information.

There are a variety of learning styles and models available which have been developed during the past few decades. Some learning style researchers try to eliminate confusion about the concept. According to Coffield, Moseley, Hall, and Ecclestone (2004) said in one such attempt suggested by Curry 1983 learning styles approaches were categorized into three levels. This was called Curry's onion model. According to Sadler-Smith (2001) in one such attempt suggested by Curry (1983) learning styles approaches were categorized into three levels. This was called Curry's onion model (see Figure 1). His model consisted of a cognitive personality element in the inner layer, information processing style in the middle layer and learning preference style in the outer layer.

Figure 1. Curry learning styles' model



Source: Coffield et al., 2004.

De Bello (1990) highlighted that various types of learning styles are known for each nation and he reported that a generic definition of learning styles would be how learners receive, process and maintain information. In addition, De Bello evaluated eleven learning style models which had been developed in American educational systems and classified learning style models into two categories - multidimensional, which were inclusive of cognitive, affective and psychological characteristics; or one-dimensional, which had a single variable, either cognitive or psychological. Also, Reid (1995) divided learning styles research into three major categories: cognitive learning styles, sensory learning styles and personality learning styles.

Felder (1996) differentiates between learning styles as follows;

> "Students have different learning styles – characteristic strengths and preferences in the ways they take in and process information. Some students tend to focus on facts, data, and algorithms; others are more comfortable with theories and mathematical models. Some respond strongly to visual forms of information, like pictures, diagrams and schematics; others get more from verbal form- written and spoken explanation. Some prefer to learn actively and interactively; others function more introspectively and individually" (p, 18).

The lack of a clear definition of the concept of learning styles forces researchers to define learning style according to their academic and experiential background, with the term referring of all the elements a learner needs to achieve his or her educational goals. Learning style is the natural ability of a learner to adapt his or her sensory receptors to the available learning environment in order to absorb information and process it according to his or her experiences and subsequently share the output with society.

Learning Styles and Cognitive Styles

The term learning style is used by some researchers in educational psychology to describe cognitive style. James and Gardner (1995) claimed that "although the terms learning styles and cognitive style are sometime used interchangeably, the term learning style appears more regularly in print; it also appears to be the broader term" (p.20). McFadden (1986) and Guillory (1990) both noted that a trend was prevalent for authors to use the terms as if they had the same meaning or as Stash (2007) and Liu and Ginther (1999) noted, interchangeably. According to Woolfolk (2001) the terms learning or cognitive style refer to the different ways of perceiving and organizing information. In addition, Hunsaker (1981) considered learning style as part of cognitive style and stated that "learning style, as one aspect of cognitive style, refers to a person's characteristic style of acquiring and using information in learning and /or solving problems" (p.145).

However, the term cognitive style was used more commonly than learning style during the early period of learning styles research (Yim, 2009). Garity (1985) indicated that the term learning style was used in experimental research to describe dimensions of learning such as thinking, perceiving and remembering. Learning styles and cognitive styles are different according to Dunn, Dunn and Price (1981). Riding and Cheema (1991) claimed that the number of style elements can be considered as one main difference between learning and cognitive styles - while learning styles involve many elements which are not necessarily

either/or extremes, cognitive styles have two distinct poles. Butler (2004) stated that the argument about differences between learning and cognitive styles was the reason to restrain important study in individual differences. Hong and Milgram (2000) highlighted an important difference between learning and cognitive style. They established that cognitive style studies did not pay attention to the effects of individual interpersonal and intrapersonal characteristics, while learning style studies looked at personal social and situational preferences in formal school settings.

Learning Style Theories

Learning style theories refer to the diverse styles of learning people use for the purpose of gaining knowledge. Zepeda and Mayers (2004) reviewed learning style theories to those of Carl Jung in 1927. Learning style theories describe the extent of the learning approach used by individuals in learning different subjects or topics. Assumptions and foundations of learning style theories are different from each other. The basic tenets of each of the learning style theories are diverse and influence the learning attitude of students. Martini (1986) suggested that in the face of the variance in learning style theories there are numerous interrelated factors and mutually supportive concepts between them. This thesis, however, will specifically focus on the following learning styles: Kolb Experiential Learning Theory, Dunn and Dunn, VAK, Felder-Silverman Learning Style Model, the Gregorc Model and VARK model. These theories are considered as the most frequently used theories in educational research.

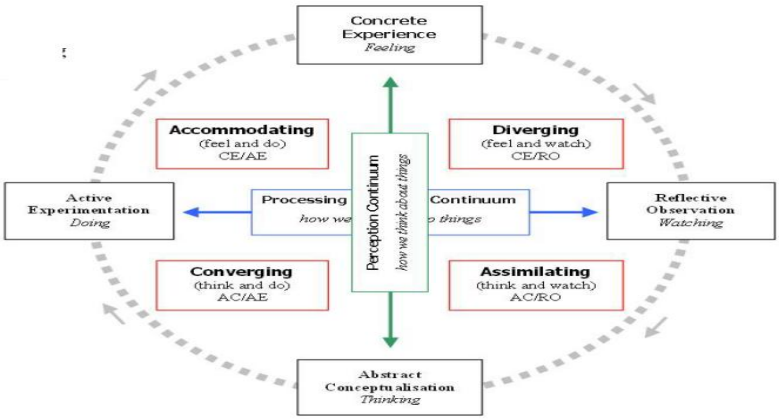
Kolb's learning style theory.

This learning style is based on Kolb's Experiential Learning Theory, which states that the learning process is composed of four stages, each having its own individual learning style preference (Sirin & Guzel, 2006). According to Kolb (1984) his perspective on learning is called experiential for two reasons; first, "to tie it clearly to its intellectual origins in the work

of Dewey, Lewin, and Piaget," second "to emphasize the central role that experience plays in the learning process" (p, 20). Fox and Ronkowski (1997) proposed that implementation of teaching methods developed using Kolb's learning style theory generally has a positive outcome for learning.

Kolb (1976, 1984) categorized the four stages of a learning cycle as: Concrete Experience (CE), Reflection Observation (RO); Abstract Conceptualization (AC) and Active Experimentation (AE), the model demonstrated in Figure 2. Concrete experience refers to the process of learning where an individual learns through actively experiencing an activity. Reflective observation, on the other hand, refers to the learning process where an individual learns through conscious reflection about the activity. Abstract conceptualization pertains to the learning process where an individual learns by being presented with a theory or model that has to be observed. Finally, active experimentation refers to the learning process where an individual learns through testing a theory or model. It is also implied that each individual has his own strengths within each of the four stages and this is the basis of his preferences for learning style (Bell & Griffin, 2007).

Figure 2. Kolb's experiential-learning model and four-learning styles



Source: www.businessballs.com.

Sims (2002) noted that within Kolb's theory learning proceeds as a cycle and as a result of the combination of the four forms (see Figure 2). Students have to be active and

involved with new experiences, with the learning cycle of Kolb's learning theory considered the heart of the model. Therefore, the basic assumption of Kolb's cycle or learning sequence is that learners can achieve when they are active, and that they can be accountable for their learning and implement their knowledge. Healey and Jenkins (2000) claimed that "the different stages of the cycle are associated with distinct learning styles" (p, 185). Claxton and Murrell (1987) give an account of Kolb theory in practice and stated that it not only deals with style, but also examines the basic question of learning and individual development.

The Kolb learning style theory identifies four types of learners, labelled as diverger, assimilator, converger, and accommodator (see Figure 2). Dornyei (2005) described the four types of learners as pure and extreme cases, as Individual learners may display some combination of the four types.

According to Kolb, Boyatzis and Mainemelis (2000) learners who are between concrete experience and reflective observation are designated as divergers or reflectors. Danish and Awan (2009), Russian (2005) described divergent learners through their capacity to view a situation from various perspectives, being highly dependent on brainstorming. They are the opposite of convergers and their strengths lie in their creative, imaginative, and innovative natures. They perform well in concrete situations and have the ability to generate a large number of ideas through brainstorming. Unlike convergers, they prefer and are more interested in people rather than things. They think deeply about experiences and learn from these, and like to receive constructive criticism since they value feedback highly. They are also interested in careers like arts and humanities. These kinds of learners are interested in other members of society and tend to be emotional and inventive. Students who follow a divergent style of learning are inclined to be strong in art and prefer to work in groups

Assimilators are learners who are between reflective observation and abstract conceptualization (Kolb et al. 2000). According to Danish et al. (2009) Russian (2005)

assimilating learners' use inductive reasoning and are capable of creating theoretical models. They prefer logical and concise approaches to solving problems. Their strength lies in their excellence in inductive reasoning. In addition, they are more interested in abstract concepts than things or people. They think more than they act. They much prefer lectures as a mode of teaching and are in careers like research and planning. They are less interested in other people and more concerned with abstract concepts and ideas.

According to Kolb et al. (2000) convergent or pragmatic learners are between abstract conceptualization and active experimentation. Danish et al. (2009) and Russian (2005) indicated that convergent learners are highly dependent on deductive reasoning. These kinds of learners are able to solve problems and will utilize their learning to discover the solutions to practical issues. They delve into situations where there is a single answer or solution to a question. They are also unemotional in nature and prefer to deal with things rather than with people. They also prefer to work alone, think cautiously and act independently. They are interested in physical sciences, engineering, or computer sciences.

Lastly, accommodators or activists are learners who operate between active experimentation and concrete experience (Kolb et al. 2000). Accommodators are those who perform active experimentation and carry out plans and strategies. They are risk takers in nature and excel in situations that require quick decisions and adaptations. They are also intuitive in nature and solve problems using trial and error. They are dependent on other people as sources of information and are more action- oriented than thinking oriented. These learners are concerned with new experiences and challenge them in accomplishing stated plans. They are interested in careers like nursing, teaching, marketing or sales (Danish et al. 2009, Russian, 2005). Healey et al (2000) described learners by using the Kolb learning style theory, supporting the view that divergers are discerning and gather broad information; that

assimilators present information using logical theories; that convergers provide the practical implementation of concepts and theories and that accommodators transmit experience.

According to Danish et al. (2009) and Hsu (1989), drawing on the Kolb theory, the learning process is composed of two combined dimensions: perceiving and processing information (see Figure 2). The first dimension, perceiving information, commonly occurs during concrete experiences. It allows for the process of learning using a person's actual experience and abstract conceptualization, or learning by thinking. The second dimension, processing information, occurs through reflective observation. It involves the process of learning by watching or listening, and active experimentation.

Many studies have been conducted based on the Kolb learning styles theory. A study by Berger (1983) used the Kolb Learning Style Inventory in classifying the learning style preferences of hotel unit and operation managers. The results of the study showed that 32% of unit managers were accommodators and 32% were convergers. On the other hand, 26% of operating managers were divergers, and 10% were assimilators.

A study was also conducted among nursing and midwifery students in Tabriz Medical University to identify the learning style preferences of the respondents. The study also used Kolb's Learning Style Inventory and the results of the study showed that a majority or 54.2 % of respondents prefer a convergent learning style, followed by assimilators (32.1 %), accommodators (7.5 %) and, lastly, divergers (6.2 %). Moreover, the study showed that the respondents preferred visual methods of teaching like the use of diagrams, availability of handouts and other self-learning methods (Zamanzadeh, Valizaded, Fathi-Azar and Aminaie 2008).

Gorrha and Mohan (2010) aimed to understand the learning preferences of business school students based on Kolb's theory of learning style preference. The results of their study showed that a majority (70 %) of their respondents highly valued lectures as part of their

learning style preference. Danish et al (2009) conducted a study among medical students using Kolb's Learning Styles Inventory. The results indicate that the respondents prefer assimilating and convergent learning styles. Novin, Arjomand and Jourdan(2003) conducted a study to determine the learning style preferences of accounting management, marketing and general business majors students using Kolb's Learning Style Inventory. The results of the study showed that a majority of the respondents in all four major courses preferred assimilating and convergent learning styles.

A study by Galpin, Sanders and Chen (2007) also used Kolb's Learning Style Inventory to determine the learning style preferences of computer science students in a South African University. The study suggested that the majority of students prefer an abstract approach in their learning process and very seldom prefer a reflective or active learning style. According to Kolb's model the study found that the majority of respondents were convergers or assimilators in terms of their learning style. Kocakoglu (2010) determined the learning styles of teachers using the Kolb Learning Style Inventory. The study was based on the assumption that a teacher's learning styles preference is also vital in the learning process. Based on Kolb's model, the study determined that the majority of respondents (48%) preferred a convergent learning style and (24%) preferred an assimilating learning style; followed by accommodating (18%) and divergent (10%) learning styles. Smith (2010) conducted a study among licensed nurses who were enrolled in a course, using Kolb's model to determine their learning style preferences. The results showed that the majority of respondents were accommodators (31%) followed by assimilators and divergers (20%). The least preferred learning style was convergent (19%).

In summary, Kolb's learning styles theory proposes four types of learner: assimilators, convergers, divergers and accommodators. Research using this model has identified convergers as the more common learning style. The convergent learner featured in this theory

is close to the kinaesthetic in VARK theory. However, Kolb's learning styles model is usually applied to adults rather than children.

Dunn and Dunn learning style theory.

The Dunn and Dunn learning style model is considered as one of the most popular learning styles theory in the educational field. Zepeda et al (2004) noted that this model was developed in 1967. Sage (1984) reported that the development of the Dunn and Dunn learning style model was as a result of a literature review covering dissertations, educational and industrial research studies and practical publications designed for educators. Brandt (1990) indicated that Guild describes Dunn's model as a diagnostic and prescriptive model. According to Dunn and Milgram (1993) and Garnett (2005) this model is based on two learning theories, cognitive learning style and lateralization learning theory. Cognitive learning style is grounded in the notion that individuals process information in different ways, according to the basis of inherent or learned attributes. There are two dimensions of cognitive style: conceptualization and field dependence-independence. The dimension of conceptualization is associated with an impulsive continuum of thinking styles, which can be observed when an individual responds to different situations. The dimension of field dependence-independence is associated with a global, analytical style of thinking. A thinking ability continuum is utilized in this learning dimension. The second theory is brain lateralization. This theory is grounded in the notion that the functions of the two hemispheres of the brain are different; for instance, the right brain deals with emotions and spatial/holistic processing while the left brain deals with verbal-sequential abilities.

The model developed by Dunn and Dunn is established on certain assumptions. These are as given:

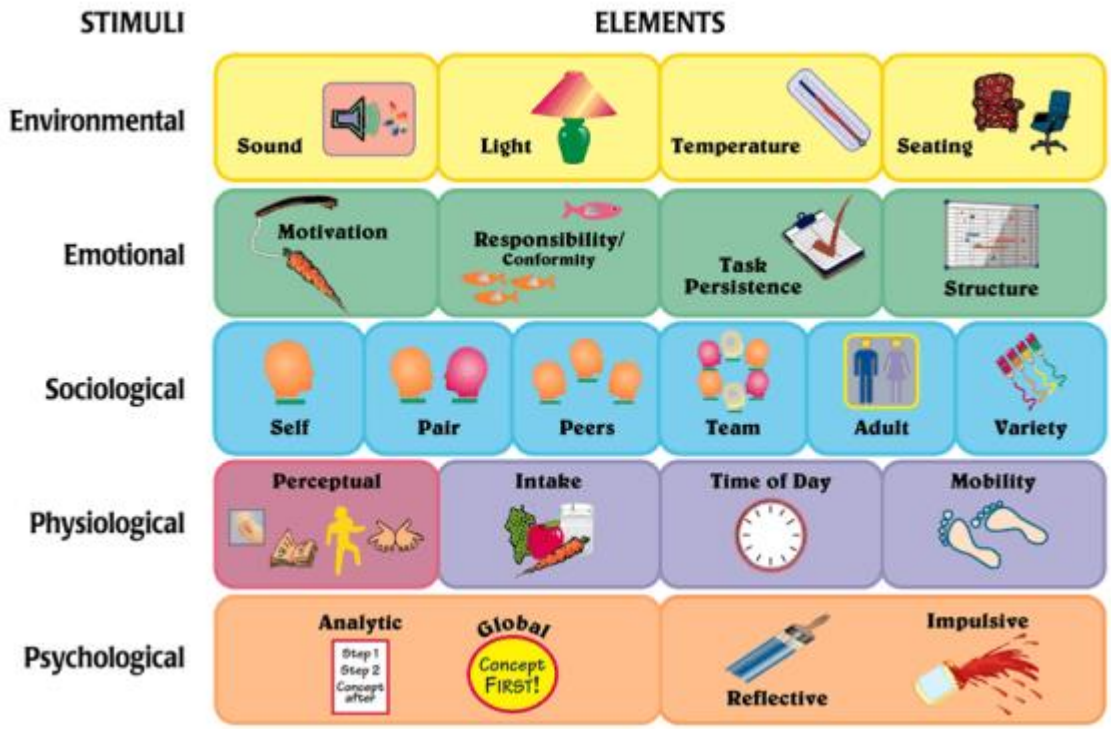
First, most individuals can learn; Second, instructional environments, resource, and approaches respond to diversified learning style strengths; Third, everyone has

> strengths, but different people have very different strengths; Fourth, individual instructional preferences exist and can be measured reliably; Fifth, given responsive environments, resource, and approaches, students attain statistically higher achievement and attitude test scores in matched, rather than mismatched treatments; Sixth, most teachers can learn to use learning styles as a cornerstone of their instruction; seven, many students can learn to capitalize on their learning style strengths when concentrating on new/ or difficult academic material (Dunn and Dunn, 1992, p. 6).

Garnett (2005) stated that the Dunn and Dunn learning style model can be classified into five categories. According to Dunn and Dunn (1992) these categories are called stimuli. The Dunn and Dunn model describes the five basic stimuli, each of which possessing some elements that can directly affect an individuals' ability to master new or difficult information or skills (see Figure 3). The five stimuli are as follows: firstly, instructional environment. Ryner (2000) explains that environmental stimuli consist of a light element, a sound element, a design element and the temperature. These stimuli include preferences for loud versus quiet, low versus bright lights, warm versus cool temperature and formal versus informal settings (Dunn and Griggs 2000). The second set of stimuli relate to emotional states. Sage (1984) defined the elements of these stimuli as including motivation, persistence, responsibility, and structure. These stimuli relate to high or low motivation, persistence, responsibility and preference for structure and choices (Dunn et al., 2000). The third sets of stimuli are sociological. These include preferences for variety versus a patterned or routine way of working and the desire to work alone or in groups or pairs under the supervision of an authoritative adult (Dunn et al., 2000). Ryner (2000) analysed students' behaviour according to elements in these stimuli; self element, pair element, peers element, team element, adult element, and varied element. These elements of learning style are related to the preference of students for engaging in different types of tasks during the course of learning. The preference

of the student for routine work or for a mixture of different processes during learning is also evaluated. The fourth sets of stimuli are physiological. This includes perceptual strengths, as well as preferences over time of day, intake of food and mobility (Dunn et al., 2000). Hall (1993) stated that this element consists of a perceptual element which mainly emphasizes viewing, listening and touching. Intake is the second element in this category which relates to the requirement of eating and drinking during the learning process. The time element refers to a student's energy level during the day at varied time periods or intervals. The last element is mobility. In this element of learning style preference, students' ability to sit for a long period of a specific duration when they are interested in the topic at hand is analysed. This element is related to the level to which students prefer to move their body while learning. The fifth sets of stimuli are psychological, indicating processing tendencies. Two elements of learning styles are grouped in these stimuli (Dunn et al., 2000). Ryner (2000) showed these elements as global versus analytical. This element is concerned with identifying whether students learn most effectively when they reflect on the total topic of learning or when they approach the task in a sequential way. Students who are interested in global learning are more concerned with the end outcomes and the total meaning. Students with analytical preferences, however, prefer one detail at a time. The third element is impulsive versus reflective. This element relates to the pace of thinking. The preference of students to draw conclusions and make decision quickly is analysed. The choice by students to use these different alternatives and the evaluation of these alternatives is assessed.

Figure 3. Dunn & Dunn-learning styles' model



Source: www.learningstyles.net

Reese and Dunn (2008) conducted a study with the aim of identifying learning style preferences of undergraduate freshmen students and determining the relationship gender and academic achievement, specifically in terms of grade point average (GPA). The results identified several common learning style preferences among freshmen students, these being preferences for sound, light, temperature, motivation, and responsibility. The study reported significant correlations between students learning styles and academic achievement. Furthermore, the study was able to determine that the highest academically achieving freshmen students prefer to work alone or with an authoritative figure during the late morning or early afternoon, while those who have a relatively high level of academic achievement prefer a formal and well lit learning environment. Also, those who have the lowest level of academic achievement have preferences for studying or learning in the evening with sound or a conversation with other peers in the background. They also preferred motivation and mobility while learning. In terms of gender, the researchers reported that male respondents

prefer to learn with an authoritative figure and a learning environment that allows mobility and structure. They also prefer to learn during the afternoon. Female respondents, on the other hand, prefer a learning environment with bright lights, a warm temperature a formal setting, and with a variety of instructional means. They also prefer to work independently or with a few peers. It was also determined that they were auditory, tactual and kinaesthetic learners who prefer to work in the morning.

Similarly, Morton-Rias et al (2008) examined the learning styles of students who enrolled in an allied health course. The study determined the relationship between learning style preferences and age, ethnicity and gender. The study identified learning style preferences for sound, light, temperature, seating design, food intake, time of the day, mobility; and auditory, tactual and kinaesthetic stimuli. Furthermore, it was determined that male allied health students have preferences for cool temperatures, mobility and learning in groups while female students preferred an auditory learning style.

Tully, Dunn and Hlawaty (2006) conducted a study to determine whether teaching methods and learning material based on the identified learning style preferences of students is better than traditional teaching methods. The study showed that those who were taught based on their learning style preferences had better performances than those who were taught using traditional teaching methods. Another study using Dunn's model was conducted by Mariash (1983) to examine the learning style preferences of Northeastern Manitoba community school students. The results indicated that there were 18 learning style variables preferred by 25 % or more of the students and there were no learning style variables which were preferred by 100 % of students. A study by Ricca (1984) also used Dunn's model in order to determine if the learning styles of gifted children are different from the learning styles of other students. The sample consisted of 200 students identified as gifted and 225 general students in grades four, five and six in one city school and one suburban school in Western New York. The results

showed that there is a significant difference between the learning style preferences of gifted and other students. Gifted students were found to be more highly motivated, persistent, responsible, adult and teacher motivated and that they preferred learning alone and tactile learning. Other students preferred structured and peer oriented learning, learning in several ways, auditory learning, visual learning, mobility and learning with authority figures.

The previous studies provided some evidence about the capacity of the Dunn and Dunn theory to determine learning styles. This theory was widely used to assess preferred learning styles, especially for young children.

VAK theory.

VAK theory is considered to be one of the classical learning theories in the educational field, it is best known as VAKT, visual (V), auditory (A), kinaesthetic (K) and tactile (T) (Mackay, 2007). Dunegan (2008) noted that the first development of VAK was in 1920, by psychologists and teaching specialists such as Fernald, Keller, Orton, Gillingham, Stillman and Montessori. The Federal Aviation Administration (2009) outlined that a VAK learning style is based on the student receiving vision, hearing and touch. Miller (2001) described a VAK learning style as the perceptual, instructional preference model which classifies learners by sensory preferences. The Intel Corporation (2007) reported that this theory has proven to be a popular and simple way to identify different learning styles. Dreeben (2010) suggested that the practical mode of VAK assessment, which includes asking learners about the way they receive information, is a strong reason for using it in the educational field. Byrnes (2010) stated that "the VAK model can be utilized to assist in incorporating different learning techniques into classroom instruction and activities" (p. 4). Mackay (2007) proposed that according to the VAK learning style, most people have a leading learning style that may be aligned with other preferences. A study conducted by Willis and Hodson (1999) using the VAK theory determined that 29% of elementary and high

school learners are visual learners, 34% are auditory, and the remaining 37% are kinaesthetic learners. Similarly, a study by Lisle (2007) used a VAK learning model in determining the learning style preferences of adults who experience learning difficulties. The study showed that (34%) participants preferred a visual style, which was an equal proportion to those who prefer an auditory style (34 %). Of the remaining students, (23 %) were kinaesthetic learners and (9 %) had multimodal learning style preferences.

These results concluded in the studies of Hodson (1999) and Lisle (2007) based on VAK theory. The result showed most of the learners preferred visual and auditory learning, and that younger learners prefer kinaesthetic more than adult learners.

Felder-Silverman learning style model (FSLSM).

This learning style model was constructed and developed by Richard Felder and Linda Silverman in 1988 (Felder & Spurlin, 2005). Blackburn (2009) reported that:

> This model combines some of the dimensions based on Jung's theory of psychological types (Sensing, Intuition) present in the Myers-Briggs model, with information dimensions from Kolb's model such as Active/Reflective. The Felder-Silverman model avoids the complexity of the Dunn and Dunn model (p. 32).

Graf, Liu, Kinshuk, Chen and Yang (2009) noted that the Felder- Silverman model describes learning style in a detailed manner, focusing on distinguishing between the preferences of a learner and enabling an adaptive learning system to provide courses better tailored to the learner's preferences. The initial model of Felder-Silverman has five dimensions, as follows: information perception, input modality, organization, information processing, and understanding (Felder et al., 2002). According to Roig (2008) "the learning style dimensions proposed by Felder and Silverman (1988) were based on some previously ascertained models and new concepts to provide teachers with teaching styles that may be better suited to teach the students once their learning styles are known" (p. 35). Felder et al.

(2002) stated that the model classifies students according to where they fit on a number of scales pertaining to the ways they receive and process information.

The initial model of Felder and Silverman was comprised of five dimensions. According to Caldwell (2009) their more recent model of consisted of four dimensions after the author's drop organization dimension. These dimensions are described below.

Information perception (sensing/intuitive) learners prefer a sensory learning style, are patient with details and like to relate to the topic and apply it to the real world. Such learners also like to discover possibilities, relationships and underlying meanings. They learn through concrete or abstract forms of learning materials such as facts and theories. They are also creative, innovative and open minded in nature (Austin, 2001; Felder et al, 2002).

Input modality is the second dimension and it focuses on visual/auditory learning. Graf et al (2009) reported that in this dimension, students learn in terms of pictures, diagrams, text or flow charts. While the term auditory refers to sounds and therefore auditory learners tend to learn based on what they hear, kinaesthetic is a combination of the visual and auditory, encompassing senses such as taste, touch and smell.

The information processing (active and reflective) is the third dimension, distinguishes between types of information processing. Active learners maximize their learning by being active with information, applying the information and testing it. They learn best in groups with open communication wherein they can discuss the information learned. Reflective learners on the other hand are the complete opposite. They prefer to work alone and think and reflect on the learning material (Austin, 2001).

The last dimension considers learners as categorized in terms of their understanding. According to Graf et al (2009) sequential learners learn in a fashion and progress in small steps. They have a tendency to follow stepped paths in both learning and finding solutions. However, global learners absorb and understand learning materials randomly with no pattern

or connection. They use a holistic thinking process and learn in large progressive leaps. They find solutions but, experience difficulties in explaining them.

The organization dimension was consisted of inductive/deductive reasoning. The inductive learner observes the world and then draws inferences while the deductive learner goes from generalities to particulars (Felder et al., 2002).

Parvez (2007) stated that "the dimensions of Felder-Silverman are continuous and not discrete" (p, 26). The number of dimensions of the model was reduced to four, after Felder (2002) deleted the organization dimension and modified the visual/ auditory to become visual / verbal dimension. Tsvigu, Breiteig, Persens and Ndalichako (2008) justified the reason for Felder to discontinue the organisation dimension because of the contradiction between inductive and deductive reasoning.

Felder (2005) proposed that each of the previously stated dimensions of the FSLSM has a similar dimension in other learning style models. The active/reflective dimension is equivalent to the same dimension in Kolb's learning style model, where active learners is related to extroverts and reflective learners is related to introverts in the Myers- Briggs type indicator (MBTI). The dimension could be taken from one model and have a direct counterpart in the other model. For example sensing/intuitive is taken directly from the MBTI and matches the concrete/abstract dimension in the Kolb model. Parallel dimensions to the active/reflective and visual/verbal dimensions are present in the visual-auditory kinaesthetic formulation of modality theory and neuro-linguistic programming. In cognitive studies of information processing the visual/ verbal difference is also central.

A study by Shams and Emamipour (2008) used the Felder- Silverman model to determine if there was a significant difference between the learning styles of monolingual and bilingual students, and its subsequent relationship to academic achievement and gender. The study showed that there is a significant difference between the learning styles of monolingual

and bilingual students. It was determined that monolingual students prefer an intuitive–visual learning style while bilingual students preferred sensational–verbal learning. Moreover, the study demonstrated a significant difference between the learning style preferences of monolingual and bilingual students in terms of gender. The study determined that male respondents preferred a visual–holistic learning style while female respondents preferred a verbal-consecutive learning style. However, the study found no significant difference between the learning style preferences of monolingual and bilingual students in terms of academic achievement.

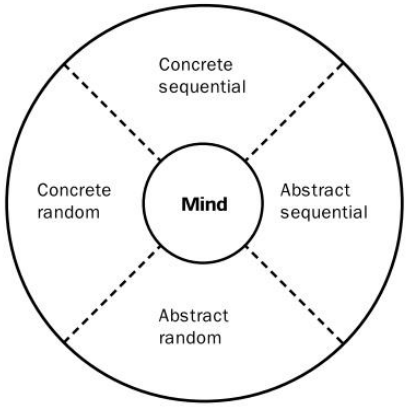
The theory of Felder- Silverman is most frequently used in engineering and adult education. The study which conducted by Shams- Esfandabad and Emamipour using this theory is considered one of the few studies which used FSLSM to determine learning styles of students in grade six through eight.

Gregorc learning style model.

According to Swansburg and Swansburg (1995) in 1982 Gregorc combined the techniques of phenomenology and psychological forces with his own theory about learning to develop the Gregorc learning style model. This theory is also called the Mind Style Model of learning styles (Chapman & King, 2009). Gregorc's learning style was based on research into hemispheres of the brain. Gregorc's fundamental thesis was that people responded to their world through specific mental processes which they use to perceive and order the world around them (Joniak & Isaksen 1988; Russo & Bruen, 2001,). O'Brien and Thompson (1994) and Kamuche (2005) provided explanations the components of the Gregorc model, which used perceptual and ordering abilities. The perceptual ability is represented as a bipolar continuum ranging from concrete to abstract. Ordering ability is represented as a bipolar continuum ranging from sequential to random.

According Gregorc theory learners can be classified into four categories: Concrete Sequential learners; Concrete Random learners (CR); Abstract Sequential(AS) and Abstract Random (AR) (see Figure 4).

Figure 4. Gregorc's learning-styles model



Source: Coffield et al., 2004

Concrete Sequential learners (CS): According to Klavas (1992) such learners "acquire knowledge through hand-on experiences and direct step by step instruction" (p, 28). Swansburg et al (1995) stated that learners in this category preferred instructional methods like diagrams, flowcharts, workbooks with elaborate directions, documentation, computer-aided instruction and active tasks. This type of learner faces difficulty with multiple alternatives or solutions to questions.

Concrete Random learners (CR) become more familiar with an unstructured learning environment. They tend to expand on contentions; if they are able to utilize their intelligence they can work effectively, both independently and within groups (Chase, Driscoll, Stewart, Hayhoe & Leech 2007; Kamuche, 2005).

Abstract Sequential learners, (AS) according to Kamuche, (2005) choose a highly analytical, verbal and logical method that is based on intelligence. This kind of learner has strong decoding abilities with written, verbal and image symbols (Klavas, 1992). According to Chase et al (2007) they are strong in problem solving skills.

Abstract Random (AR) learners, according to Chase et al, (2007) prefer to centre on kinships and related emotions. They react to the visual approaches of group discussion, instruction and time for reflection. Learners in this category may be awkward with distance education methodology as it does not involve emotional engagement through face to face meetings. They have a poor response to step by step logical presentation.

Sagor and Cox (2004) stated that "Gregorc research indicates that most people have a profile that emphasizes one of these preferences over the others although everyone has within them some facility with each style" (p. 101). Coates (2007) outlined how Gregorc's work connects the abstract with the right hemisphere and the concrete with the left hemisphere.

Lowenstein and Bradshaw (2007) and Tittnich (1986) indicated that categorization of Gregorc learning styles is similar to the Kolb learning model.

Gregorc theory defines individual learning styles as inborn predispositions and proposes that it is the teachers' responsibility to adapt the instructional materials to match the students learning strength. Gregorc also believed that individual learning styles are flexible which mean the weakness of individual learning styles could be changed.

VARK theory.

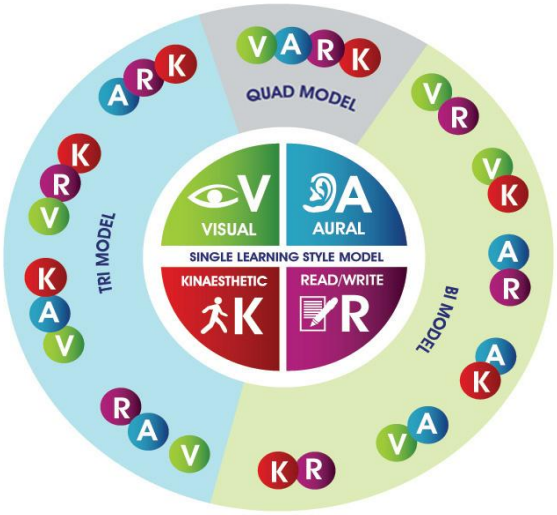
Fleming and Baume (2007) stated that "VARK is an acronym for Visual, Aural, Read/write and Kinaesthetic" (p. 5). It stimulates learners' senses by supporting a person's preferences for particular types of external events (Hassan, 2009).

Nilson (2010) noted that Fleming and Mills developed VARK as a framework that reflects the preferred physical sense of learners during the learning process. Murphy, Gray, Straja and Bogert (2004) claimed that the VARK model was expanded by Fleming in order to further differentiate the visual category into graphical and textual or visual and read/write learners. It was also the first model to systematically use a series of questions with help sheets

for students, teachers and employees in order to identify an individuals' preferred way of processing information.

The VARK model subdivides learners into four primary learning styles categories. Students whose learning is based on more than one style are called multimodal learners (see Figure 5). A brief description of those categories can be found below:

Figure 5. VARK categories.



Adaptation and design by the researcher 2011 based on the VARK categories.

Visual learners, according to Fleming (2006) and Drago and Wagner (2004) prefer to learn using materials such as charts, graphs, and other symbolic devices. They rely on sight when taking information in and when organizing information or ideas. They commonly use different colours and highlighters when processing information and are encouraged to use diagrams, drawing or recall pictures to reinforce information. Aural learners prefer to learn through spoken lessons, talking and discussion; they understand more when the learning material is explained to them, and thus excel more when traditional teaching methods are used. They also learn best by attending lectures, tutorials, and discussions (Fleming, 2006; Tennent, Becker & Keho, 2005). Read and write learners prefer to learn from printed or textual learning materials. They are characterized by their use of lists, headings, dictionaries, glossaries, definitions, handouts, textbooks and lecture notes when processing information

Fleming (2006). Kinaesthetic learners, according to Fleming (2006), and Ramayah, Sivanandan, Nasrijal, Letchumanan and Leong (2009) prefer to learn through direct practice, and are thus referred to as "hands on learners". They learn best through activities, field trips, tours, or activities where they can engage all senses when processing information. They have excellent hand-eye coordination skills.

A study conducted by Lincoln et al. (2006) focused on the learning styles of adult English as a second language (ESL) students in Northwest Arkansas using a VARK learning style model. A total of 69 students from 17 countries responded to a VARK questionnaire. The results showed that approximately one third of participants gravitated towards read/write as their favoured learning style. Of the remaining respondents, 20% preferred aural learning, 25% preferred kinaesthetic learning and 4% preferred visual learning. The remaining 17% preferred multiple mode learning. Meehan-Andrews (2009) investigated different learning styles among first year health science students to determine the benefits that students obtained from each teaching strategy. He used VARK in order to ascertain the learning style preferences of participants, and the results showed that the majority of students 54% were unimodal learners. Among this group, 7% preferred visual learning, 3% preferred aural, 10% preferred Read-write and 36% preferred Kinaesthetic learning. The remaining 46% were, multimodal learners, with 20% being bimodal, 10% tri modal and 16% quadmodal. A study by French, Cosgriff and Brown (2007) used the VARK model to examine the learning styles of 120 occupational students at La Trobe University. The result showed that the majority 33% of students were kinaesthetic learners, followed by quadmodal learners 18.1%), whereas either visual or aural (as the single modal), bimodal and tri-modal were the least preferred methods of learning for occupational therapy students.

Learning Style Instruments

Usually, learning style instruments reflect the theory that there are a number of methods by which individual learning style can be evaluated. Yang (1996) stated that learning style instruments are wide-ranging in format, length and complexity. He also stated that some instruments are easy to use while others require training to administer and interpret. Some leaning style instruments frequently used in the educational field include:

Kolb learning style inventory.

The Kolb Learning Styles Inventory (KLSI) is one of the most widely used learning style inventories in the educational field. According to Cassidy (2004) The Kolb Inventory was designed to measure four scales of learning abilities: concrete experience (CE), abstract conceptualization (AC), reflective observation (RO) and active experimentation (AE). The first version of the Kolb Inventory was developed in 1976 with nine items as a self report inventory (Cassidy, 2004). According to Kolb and Kolb (2005) the inventory was "originally developed as an experiential educational exercise designed to help learners understand the process of experiential learning and their unique individual style of learning from experience" (p. 9). The revisions of the inventory in 1985, 1993, 1999 and 2005 aimed to improve its effectiveness. The items of the inventory were increased to twelve scored items on each scale, where each item asks the respondent to rank in order four words that best describe the respondent's preferred learning style (Kolb et al., 2005).

Merrit and Marshall (1984) conducted a study to evaluate the reliability and validity of the original Kolb inventory. The researchers used an alternate normative questionnaire adapted from the inventory. This alternate version used the same list that comprised the original inventory and respondents were asked to rate the degree to which each word was characteristic of their preferred learning style. The Cronbach Alpha score for CE, RO, AC and AE scales were .29, .59, .52 and .40 respectively.

Heffler (2001) used test – retest correlation coefficients to examine the reliability for each scale in the Kolb inventory. A test and retest were conducted using undergraduate students commencing the general psychology course at Stockholm University. A sample of 85 individuals was used in the first test, whereas 61 were used in the retest. The result showed high significant correlation coefficients for all the inventory scales. The reliability of inventory scores were: CE = .65, RO = .81, AC = .63 and AE = .74. A later study conducted by Kayes (2005) also explored the reliability of the Kolb learning style inventory. The study calculated Cronbach's alpha as a measure of internal consistency with the results as follows CE = .77, RO = .82, AC = .76 and AE = .82.

The purpose of Platsidou and Metallidou's (2009) study was to test the reliability and validity of the Kolb inventory using a sample of Greek students. Four groups of participants were involved in the study: (a) sixty four primary school teachers with more than ten years experience, (b) 108 undergraduate students in the Department of Primary Education, (c) 89 undergraduate students in the Department of Psychology and (d) 79 undergraduate students in various departments of the School of Polytechnics. They reported satisfactory internal consistency reliability for all four scales of the Kolb inventory, with scores of CE = .81, RO = .72, AC = .76 and AE = .76, while the construct validity was found to be problematic. Ling (2008) stated that the Kolb inventory has strong face validity and acceptable internal consistency, and as a result revised the inventory permanently.

Dunn and Dunn and Prices learning style inventory.

Dunn and Dunn's initial 1978 inventory was called the Learning Styles Questionnaire (LSQ). It was the first in a series of Dunn's measurements, which consisted of a 228 item version developed to measure the learning styles of children from grades three to twelve (Jonassen et al. 1993). According to Coffield et al. (2004) the next version of the Learning Styles Inventory by Dunn, Dunn and Price (1992) was a reworking of the original version

based on factor analysis of individual items. It had 104 self report items with a three point Likert scale (true, uncertain and false) for students from grades three to four and a five point scale (strongly disagree, disagree, uncertain, agree and strongly agree) for students from grades five to twelve. The inventory asked students to respond to items relating to the key factors of the construct: sociological (pairs, peers, adults, self, and group); physical (perceptual strengths, auditory, visual, tactile, kinaesthetic, mobility, intake and time of day); environmental (light, sound, temperature and design); emotional (structure, persistence, motivation and responsibility) and psychological (global-analytic, impulsive-reflective and time of day). Wintergerst, DeCapua and Itzen (2001) indicated that the Dunn and Dunn inventory focuses on the instructional and environmental preferences of students.

Hickcox (1995) stated that "the Dunn, Dunn and Price inventories were psychometrically rated overall as good reliability evidence and good validity evidence" (p, 31). Price and Dunn (1997) reported that the reliability results indicated that 95% of the test retest reliabilities for 21 factors out of 22 were equal to or greater than .60, with the only exception being the area of late morning which was .56.

Gregorc style delineator.

The first appearance of a Gregorc style delineator was in 1982 (Sadowski, Birchman &Harris, 2006). According to Gregorc (1982) this style delineator is a self analysis inventory based on mediation ability. The Gregorc style delineator consists of 40 words arranged in ten sets of four. Respondents rank the four words from the least to most descriptive of themselves, scoring 1for the least descriptive to 4 for the most descriptive. The total score for each of the four subscales is the sum of the ranking of the ten words comprising the subscale, so the raw score for each ranges from 10 to 40. Cassidy (2004) stated that the Gregorc style groups individuals into four categories; CR, CS, AR and AS. De Bello (1990) noted that the Gregorc style delineator format and design is comparable to the Kolb inventory, and it has

been suggested that observation and interviews should be used with the instrument to identify students' learning style preferences.

The first attempt to examine the reliability of the instrument was conducted by Gregorc. He reported his results in the instrument's manual (1984) with the internal consistency provided in the form of standardized alpha coefficients ranged from .89 to .93, while test–retest reliability coefficients ranged from .85 to .88. This result was criticized by Sawall (1986), drawing attention to Gregorc's failure to control for differences in the test-retest intervals and the fact that the structure of the delineator's protocol was extremely easy for individuals completing the test. The internal consistency of the Gregorc style delineator was examined in study by Joniak et al. (1988). Data in this study was collected twice, with alpha coefficients for the four scales in the first time being .55 for CS, .23 for AS, .56 for AR and .57 for CR. The second time alpha coefficients were .66, .25, 60 and 61 respectively on all scales. The study by O'Brien (1991) was designed to investigate the efficacy of the Gregorc style delineator and the underlying theoretical model to the extent that the actual structure of the instrument would permit. The reliability result of this study showed alpha coefficients of .64 for the CS scale,.51 for the AS scale, .61 for the AR scale and .63 for the CR scale. Reio and Wiswell (2006) examined the psychometric properties of the Gregorc style delineator; Cronbach's alpha coefficients on all scales were acceptable at: .64 for the CS scale, .68 for CR scale, .58 for AR scale and .54 for AS scale.

Index of learning styles.

The initial version of the index of learning styles was produced by Richard Felder and Soloman in 1991, and was based on the work of Felder and Silverman model (Felder et al, 2005). According to Henry (2008) the index assesses learning styles on four bi-polar dimensions; active-reflective, sensing-intuitive, visual-verbal and sequential- global. Velazquez and Assar (2007) described the index of learning style instrument. It consists of

forty four questions with two possible answers, where each dimension has eleven questions and thus the intensity of a dimension can vary from one to eleven. Atman, Inceoglu and Aslan (2009) indicate that "the advantage of this model is it represents the individuals learning styles as a tendency and there is a third option that somebody can be equal in both directions" (p, 901).

Testing the reliability and validity of the index of learning styles formed the aim of many studies. Graf et al. (2009) evaluated the reliability of the index of learning style, the finding was lacking, they removed the weak or less reliable questions to improve Cronbach's alpha. When this was done Cronbach's alpha became .52 for the active- reflective dimension by removing one question, .68 for the sensing-intuitive dimension by removing one question, .69 for the visual-verbal dimension by removing three questions and the sequential – global become .59 by removing two questions. Bacon (2004) describes the index learning style subscales as having poor reliability, attributing this to the difference in reliabilities among different schools. Van Zwanenberg, Wilkinson and Anderson (2000) conducted a study to examine learning styles for 284 students from the School of Engineering and the School of Business at Newcastle University. They found that the index of learning styles had low internal reliability, with Cronbach's alpha being .41 for sequential- global, .51 for active – reflective, .56 for visual-verbal and .65 for sensing-intuitive. Zywno (2003) conducted a study to examine the reliability and validity of Felder–Soloman's index. More than statistical techniques were used to achieve the purpose of this study, as the measurement was administered twice within an eight month period and the correlation between the students who responded to the test and retest was moderate to strong, with Pearson's correlation being .50 for sequential scores, .51 for visual scores, .67 for sensing scores and .68 for active scores. Internal reliability testing was performed on the items measurement which was .59 for active – reflective, .69 for sensing-intuitive, .63 for visual-verbal and.53 for sequential- global. To

examine validity, an Analysis of variance (ANOVA) was conducted to examine the differences between 388 students and 68 professors from Ryerson University on the index of learning styles. Results showed significant differences between the two populations in the mean scores on three scales out of four. Aljojo, Adams, Alkhouli, Fitch and Saifuddin (2009) examined the reliability and validity of the Felder–Soloman index of learning styles in Arabic, using 170 female students from the Economics and Administration College at King Abdul-Aziz University. The results of the internal consistency reliability for the 170 students were .31 for active – reflective, .36 for sensing-intuitive, .62 for visual-verbal and .32 for sequential- global. In the retest, conducted after a five week gap, only 31 of 170 students responded to the index learning styles the second time. The results of the retest reliability in four scale were .52 for active scores,.38 for sensing scores, .74 for visual scores and .53 for sequential scores.

Issue of Learning Styles Instruments

Although it is widely accepted that individuals have distinct preferences for particular learning styles (e.g., Bozionelos, 1997), there has been no clear research evidence showing that a person could be categorised as a particular type of learner on the basis of subjective assessment. This is because learning preferences change depending upon the learner's past experience (Cuthbert, 2005). This makes it difficult to conduct research and gather evidence in regards to classifying a person within a specific category. The evaluation of one's learning style, therefore, is the main criticism that learning style measurement models and tools have failed to overcome. Many researchers have critiqued learning style measurements and raised questions about the scientific foundation of these models. Curry (1990) reported that the efficacy of learning style measures is limited by the lack of a convincing theoretical basis. Stahl (1999) questions the usefulness of these measures and asserts that the learning style models on which the instruments are based have very little or nothing to do with creating a

positive impact on the person whose learning style is being evaluated and matched to the instructional methods of the model. Coffield et al. (2004) have examined many questionnaires and instruments used to assess the learning style. They evaluated the statements the creators of the models made and the experiential correlation between the results of applying a certain model and the person's real learning. They came to the conclusion that there is no existing learning style measurement that can be soundly authenticated with scientific evidence. They raised questions about the consistency of learning style preferences and how they could be put under just one category of a learning style and linked to a certain model. Hargreaves et al. (2005) also critiqued learning style measurements and found in their research that nearly all measurements produced extremely inconsistent results, and that there was a considerable lack of evidence supporting the claims made by the authors of these models.

According to Coffield et al. (2004), the most frequently used learning style instrument presented by Dunn and Dunn is problematic because the lack of independent research limits psychometric evidence. They suggested further investigation to evaluate the reliability and validity of the measure carried out by external, independent researchers. According to the Dunn and Dunn instrument's Markham (2004) asserts that there is "no support for use its in higher education and the evidence given for primary and secondary education is open to serious questions" (p. 6). Markham's report also discussed a meta-analysis by Dunn, Griggs, Olson and Beasley (1995) in which they came to the conclusion that the Dunn and Dunn's inventory was well supported by independent research. Subsequently, when Markham (2004) reviewed this meta-analysis, he reported that Dunn and Dunn's inventory was seriously flawed because the conclusion was made based on the studies conducted by Dunn and Dunn and their groups. Markham also stated that "where there were difficulties in the data, second order mediating factors were used to explain differences but the explanations of how these factors worked were not at all clear" (p, 9).

Lovelace (2005) countered Coffield's (2004) research and provided answers to his questions to support the efficacy of Dunn and Dunn inventory. Lovelace's meta-analysis rejected the criticism of this model and his findings implied that measuring a student's learning style preferences can be well matched with the complementary instructional methods of the Dunn and Dunn model, leading to the enhancement of the student's learning process and academic performance. After comparing Dunn and Dunn learning styles and other learning styles Given (1997-98) stated that the Dunn and Dunn learning style "(a) includes greater comprehensives, (b) is more extensively researched and (c) demonstrates higher levels of consistent effectiveness" (p. 10). In spite of inefficiency of Dunn and Dunn to determine learning styles of the adult older learner this theory consider as the best method to help the younger learners to improve learning.

Although the Kolb learning styles inventory is commonly used in the educational field, many academics remain critical of its applications. Markham (2004) indicated there was only limited psychometric evidence of the Kolb learning style inventory in education. Tennant (2006) suggested that the Kolb model makes exaggerated assumptions about the learning style preferences, and that the empirical evidence used to support the basis of this model is also flawed. Miettinen (2000) concluded that Kolb's theory is likely to give false results and does not give an explanation about learning style modifiability and life experiences. He also stated that "Kolb gives an inadequate interpretation of Dewey's thought and that the very concept of immediate, concrete experience proposed by the experiential learning approach is epistemologically problematic" (p.54). Kelly (1997) contended that the greatest limitation of Kolb's inventory had been raised by Kolb himself, in that the results of applying this model significantly depend on how the learner rates themselves. Kelly stated that "it does not rate learning style preferences through standards or behaviour, as some other personal style inventories do, and it only gives relative strengths within the individual learner, not in relation

to others" (para.20). However, Kelly has not overlooked the positive elements of the Kolb model. He states that scientists should not "underestimate" Kolb's efforts, suggesting that despite the limitations in the model, Kolb has still been able to "move educational thought from the locus of the instructor back to the learner" (para. 21).

The Index of Learning Style Questionnaire is frequently used in many fields to assess learning style. Researchers critiquing the measure (e.g. Markham, 2006) have discussed the absence of support for the use of the Index of Learning Style as a measuring instrument. This inventory has been used in many fields (for example engineering) and data has consistently been presented in conferences, but we find very little of it in published in peer-reviewed journals. Platsidou et al. (2009) found in their research that the Index of Learning Style had some psychometric limitations. Although indicating that they hoped for improvement in the weaker points of this inventory through future research, their findings implied that this inventory cannot be confidently used as an assessment tool. Coffield et al. (2004) suggested that the Index of Learning Style can be used to encourage oneself to adopt a learning style but cannot be used as a measuring tool. They also believed that the Index of Learning Style is being used inaccurately to label students and recommend learning strategies to them.

Coffield et al. (2004) also criticized Gregorc's style delineator and claimed that this model included a number of hypothetical and psychometric errors that had been overlooked by the author. They asserted that this model was not suited to measuring and assessing individuals' learning style and categorizing their learning style preferences. According to Markham (2004) this model shows "no support for its use although the available public data is very limited" (p. 6). Sewall (1986) indicated that the reliability and validity which was reported in the application of this instrument are spuriously high. He also mentioned the fact that due to all the words of a scale being in the same row, it is possible for a person to "bias the results" unintentionally by continuing to rank the words as high or low. Joniak et al.

(1988) also indicated that there is no solid evidence regarding the non-correlation of the four subscales used in this instrument.

One of the more popular instruments used to assess students' learning style is the VARK learning style questionnaire. Some of the usability features of the VARK model were investigated by Wehrwein et al (2006). They concluded that the VARK model encourages teachers to be aware to students' differences before making decisions about them, supports the idea of matching teaching methods and students preferences, encourages educators to use a variety of teaching and assessment techniques, encourages educators to redesign resources and educational environments, and provides an opportunity for students to talk about their learning style with their teachers.

The validity and reliability of VARK, however, are yet to be fully verified. Boatman, Courtney and Lee (2008) noted that few studies evaluated the quality of VARK. The limitation associated with the VARKs validity and reliability were discussed by Breckler, Joun and Ngo (2008) who proposed that the VARK questionnaire is not a complete inventory as it supplies the users with a simple profile of their sensory learning preferences. Leite, Svinicki and Shi (2009) stated that "researchers using the VARK should proceed with caution because the use and proposed interpretation of VARK scores have not yet received a comprehensive validation" (p. 15).

Factors Affecting Learning Styles

There are various factors that affect learning styles. Several studies have indicated that learning styles are affected by gender, age, cultural heritage or ethnic background. Several studies have also determined that learning styles are affected by other factors. Dunn and Griggs (1998) determined some factors that affected learning style and such as gender, age, and culture. These factors have to be considered when identifying learning style preferences of students because they can influence learning outcomes.

Learning styles and gender.

Males learn in different ways to females. Several studies have determined that there is a difference between learning style preferences in term of gender. According to Raddon (2007) gender is generally considered as one of a range of variables in learning style studies. A study by Wehrwin et al. (2007) was conducted to explore differences between male and female undergraduate physiology students in terms of learning style preferences. The researcher implanted the VARK learning model as a framework and used a VARK questionnaire as the measure to collect data. The results showed that 54% of the female respondents and only 12.5% of the males preferred a single learning style. Among the female respondents, 4.2% were visual learners, 16.7% preferred textual learning materials and 33.3% were kinaesthetic learners. Within males, learning styles were evenly distributed among aural, read/write and kinaesthetic styles. Furthermore, 45.8% of female and 87.5% of males preferred multiple modes. In the female group, 12.5% of respondents preferred a bi-modal, while 12.5% preferred a tri-modal and 20.8% a quad modal learning style. In the male student group; 16.7% preferred a bi-model, 12.5% a tri-model and 58.3% preferred a quad model learning style. Based on this result, the study was able to determine that male and female learners have different learning style preferences. Park (1997a) conducted a study to evaluate if there were differences between the learning style preferences of Mexican, Armenian-American, Korean and Anglo students. A sample of 1283 students from ten high schools from grades 9 to 12 were involved in the Park study. The study showed that, across the four ethnic groups female students have a higher preference for a kinaesthetic learning style, while male students were more tactile than female students.

Lincoln et al (2006) investigated differences between 33 male and 66 female students based on the VARK framework. The study used ANOVA to further verify that there is a significant difference between the learning style preferences of male and female learners. The

result also indicated female learners preferred to learn using their auditory senses while male learners learn best when note taking (read/write learning styles).

By using the VARK, Ramayah et al. (2009) were able to determine the influence of gender on the learning style preferences of business students. The study used convenience sampling in order to test respondents in a business school, and the results of the study showed that gender influences the visual preferences of students. Furthermore, the study was able to determine that female business students have more of a tendency than male business students to use visual and aural learning styles. Dunn, Griggs and Price (1993), while focusing on Mexican and Anglo American elementary school students, determined that there was a significant gender difference in relation to learning style preferences. The study sample included 687 Mexican American students from grades four, five and six. The data from Mexican American students was compared to data from 70.000 Anglo-American students gathered by Dunn, Dunn and Price in 1985. Students in both studies responded to the Dunn and Dunn learning styles inventory. The researchers divided the sample into eight groups; (A) Mexican American female students, (B) Mexican American male students, (C) Anglo American female students, (D) Anglo American male students, (E) female students overall, (F) male students overall, (G) Mexican American students overall, and (H) Anglo American students overall. The result showed Mexican American female students preferred varied learning approaches; sound, rather than quiet; and had a need for mobility, whereas Mexican American males possessed strong preferences for tactile learning, late morning study and had a low need for mobility. Anglo American male students preferred mobility more than Anglo American female students. In general, female students were more persistent and motivated when learning, most conforming, preferred varied learning and less tactual compared with male students overall. According to Hlawaty (2008), German male and female students demonstrated significantly different preferences for learning styles. Female students tended to

prefer well-lit learning spaces, were self-motivated, responsible-conforming, enjoyed sociological variety and were more likely to need intake than male students. Dobson (2009) conducted a study among undergraduate physiology students to determine the relationship between learning style preferences and gender based on a VARK model. The respondents were comprised of 75% females and 25% males, and the study showed that male and female students have different learning style preferences. The majority of male students preferred a visual learning style (49%) followed by read/write (29%), aural (17%) and Kinaesthetic (5%) styles. In contrast, female respondents were found to be visual learners (46%), followed by aural (27%) read/write (23%) and Kinaesthetic (4%).styles. Furthermore, the chi-square result indicated that there was a significant association (χ^2 =21.87, p <.05) between gender and learning styles.

A study was conducted by Kia, Aliapour and Ghaderi (2009) to determine the relationship between learning style preferences and the academic achievement of Iranian students at Payame Noor University (PNU). The study used memletics learning style inventory, which categorised students into seven groups; according to their learning style. These categories were: visual, verbal, aural, physical, logical, social and solitary. The study showed that most male students preferred a verbal learning style, followed by solitary. The majority of female students, however, preferred aural learning followed by verbal, visual and logical learning style. Lu and Chiou (2010) also conducted a study to determine if gender can affect the quality of learning through E-learning by making sure that the learning style preferences of students were satisfied. The sample of 353 male and 169 female students from Northern Taiwan University were enrolled in online courses, and responded to a Kolb learning style inventory. The study showed that there is a direct and positive relationship between gender and learning styles.

In (2005), Garland and Martin also used the Kolb inventory to identify the difference between the learning styles of students in traditional courses and students in matched courses taught online. The participants were 102 female and 66 male students. Data for online courses were divided by gender, to determine if gender was a factor. The result showed moderate correlations between male students' online study and abstract conceptualization. The study emphasized that both the learning style and gender of a student must be taken into consideration in order to improve the learning experience and increase learning satisfaction.

Kolb's learning cycle proposed that female and male students are attuned to different learning styles, as established in a study by Philbin, Meier, Huffman and Bouverie (1995) which used a sample of 45 females and 25 males. The result showed that 48% of male and 20% of female respondents preferred an assimilative learning style. Furthermore, the study determined that more female than male respondents preferred convergent and divergent learning styles. Also chi-square analysis showed significant difference between genders on learning style (p = 05). Maubach and Morgan (2001) conducted a study to examine the truth of certain theories related to the relationship between gender and language learning with reference to preferred learning styles. The researchers determined that there was a significant gender difference between learning styles in classrooms. The results showed that male students were more likely to be spontaneous and take risks in the learning environment, while female respondents displayed a preference for organized writing and note taking. Mammen, et al (2007) examined general surgery residents at the University of Cincinnati during the period of 1994 to 2006. The sample was comprised of 56% females and 44% males. Chi-square analysis was conducted to explore the differences between genders. The result reported significant differences in learning styles between male and female general surgery residents based on the Kolb learning styles theory. The accommodating learning style was the preferred styles for the female, while male preferred assimilating style.

Can (2009) used the Kolb inventory to determine the learning style preferences of student teachers at Mugla University. The study found that there was a significant difference in learning styles preference according to gender. The result reported half of female participant were preferred assimilating learning style and nearly one third of them were preferred converging learning style.

Honigsfeld and Dunn (2003) conducted a study to investigate gender differences among learning styles of 1637 adolescents from Bermuda, Brunei, Hungary, Sweden and New Zealand. The study based on a Dunn learning style inventory, and Multivariate (MANOVA), results highlighted a significant difference for gender with a medium effect size. The result also showed significant differences with a medium effect size for interaction of country by gender. Isman and Gundogan (2009) also found significant differences between male and female medical students at Baskent University. They used a VARK questionnaire to determine students' learning styles. The results of the study indicated that female students were significantly more likely than male students to prefer a multimodal learning style and that, conversely, male students were significantly more likely to prefer a unimodal learning style. Tamaoka (1991) reported significant differences in learning styles among male and female students from grade seven to nine. The same result was found by Lau and Yuen (2010) when they used a Gregorc style delineator to evaluate the effect of gender on learning styles within secondary school students in Hong Kong.

Some studies such as Slater et al (2007), however, dispute the association between learning style and gender. Slater et al examined learning styles among first-year medical students to determine if there was a difference in learning style preferences in terms of gender. The study used the VARK learning model and achieved a 38.85% respondent rate (97 of 250 students). The study showed that both male (56.1 %) and female (56.7 %) respondents preferred multiple means of information presentation. In terms of single styles, female

students preferred visual, aural and read/write learning more than males. Although the study determined that female first-year medical students preferred variety more than male students, the researchers noted that there was no significant difference according to gender and learning styles performance. Another study conducted by Park (2000) investigated the basic perceptual learning style preferences and preferences for group and individual learning of Southeast Asian students. The results indicated that there was no significant difference between Asian and American students' learning style preferences in terms of gender.

A similar study was also conducted by Sizemore et al. (2005) whose study focused on Hispanic university students. The Barsch learning inventory was administered to 137 nursing students and the study showed that there were no significant differences between male and female nursing students. The study of Cezair (2005) found no significant evidence to conclude that there was any relationship between the learning styles of undergraduate students and their gender based on Kolb learning style inventory. Also Cornu (1999) examined differences in learning styles using 21 males and 19 females' undergraduate students. They responded to a questionnaire which aimed to identify students' learning patterns and habits. The chi-square result indicated that there was no significant difference between the learning styles and genders of undergraduate students at an evangelical interdenominational theological college. Demirbas and Demirkan (2007) focused on design education to determine if there was a direct relationship between learning style preferences and gender using Experiential Learning Theory. The study used freshman design students in three successive academic years, with the total number of students being 273 (140 female and 133 male). The results showed no significant differences by gender in the three groups of students. Bernardes and Hanna (2009) conducted a study to examine learning styles of students in an operations management class using the adult version of the VARK questionnaire. They reported no percentage differences between male and female students who presented unimodal or multiple

modes of sensory preferences. A multimodal learning style was found to be significantly preferred by female students, whereas, a unimodal style was significantly preferred by the male students.

Some studies were conducted in Arab countries to investigate differences between males and females in learning styles but no significant differences were found. Paul, Bojanczyk and Lanphear (1994) indicated that there were no significant differences between male and female medical students in the United Arab Emirates. Furthermore, a study conducted by Alkhasawneh, Mrayyan, Decherty, Alashram and Yousef (2008) aimed to describe learning styles of third year nursing students in Jordan's public university using the VARK questionnaire. The results showed no significant difference between the learning style preferences of male and female nursing students.

Gender has been found to be a factor related to learning styles in most of the studies which examined the interaction between the two variables. However, generalizations regarding male and female learning styles are difficult to state due to conflicts in published evidence.

Learning styles and age.

Age plays a role in how individuals learn and receive information. Several studies have shown that learning style preferences have a direct relationship with the age of the learner. Jensen (2009) indicated that learning preference of the learner relied on his or her age. A study by Price (1980) stated that individuals in early childhood develop kinaesthetic and tactile skills prior to auditory skills. Thus, it can be implied that learners at different ages may use and vary in their learning styles preferences. Price et al. (1981) proposed that young children preferred kinaesthetic and tactile learning styles but slowly shift to visual learning styles as they get older. Using the Dunn and Dunn learning styles inventory, Hlawaty (2008) evaluated the interaction between learning styles and age among German learners within three

age groups: thirteen, fifteen and seventeen years old. MANOVA showed significant differences among all three pair wise comparisons of age groups; thirteen versus fifteen, thirteen versus seventeen and fifteen versus seventeen years old. The researcher indicated each age stage has special learning requirements and concluded that learning demands vary according to age. In 2001 Chan conducted a study to assess the learning styles of 398 gifted and non-gifted Chinese secondary students. The students were divided into two age groups (11-13 years and 14-19 years). The study showed a significant interaction effect between younger groups and learning style. Chan noted that younger students interacted more with structured activities and games. Honigsfeld (2001) investigated the learning styles characteristics of 1637 adolescents from five countries based on Dunn and Dunn learning styles theory. Like the Hlawaty study, students were divided into three groups: 13, 15 and 17 year olds. The study showed significant differences for sixteen of twenty two learning styles elements among the three age groups.

Another factor identified as impacted on learning style preferences was maturity. Wenham and Alie (1992) tested the relationship between learning styles and age among seven occupational groups, with participants ranging in age from 22 to 64 years. The researchers used a Gregorc style delineator and found significant differences between age and concrete-random dimensions for technicians and abstract-random dimensions for mechanical engineers. However, there were no significant differences between ages when all occupations were combined. Lincoln et al. (2006) examined the relationship between age and VARK theory learning style among students participating in English as a second language (ESL) classes. The study comprised 69 students from 17 countries, in age groups ranging from late teens to late 40s. The study reported a low positive correlation between age and the read/write learning style(r = 0.197) among all participants. Likewise, the result showed a small negative correlation between age and a kinaesthetic learning style (r = - 0.32) for male students. The

study also reported a moderate negative correlation between age and a Kinaesthetic learning style for male and female Mexican students (r = - 0.42) and (r = - 0.48)

Despite these studies reporting a correlation between learning styles and the age of learners, other studies indicate that there is no relationship between age and learning styles. A study conducted by Adesunloye, Aladesanmi, Henriques-Forsythe and Ivonye (2008) examined the preferred learning styles among medical residents and faculty at Morehouse School of Medicine. A sample of 42 participants responded to the Kolb Inventory used as the measurement tool for the study, with ages ranging from 20 to 59 years old. The study reported that there was no association between age and learning style. Delialioglu (2003) also used a Kolb Inventory to investigate learning styles in tenth grade students' kinematics graphing skills. The age of the students ranged from 14 to 21years old, with an average age of 16.7. The researcher used an analysis of co-variance (ANCOVA) to evaluate the interaction between learning styles and age, and results showed that there was no significant interaction (p = .51). Heffler (2001) also used the KLSI to examine the correlation between learning styles and age. The age range was from 19 to 37 years old. The result showed there was no correlation between age and the four learning dimensions, according to Kolb's theory. The researcher justified this negative result by concluding that different learning styles are not related to the age of the participants.

Isman et al (2008) showed the lack of relationship between learning styles and age of undergraduate students based on the VARK learning styles theory. Vafa (2002) used an adapted version of the Environmental Preference Survey (PEPS) developed by Dunn, Dunn and Price (1993) to compare learning styles among University of Houston online students. The researcher organized participants into three groups according to age. The result of a one - way ANOVA analysis showed no statistically significant difference in learning styles between the groups.

This data demonstrates that both age and gender have a distinct impact in classroom based teaching and indicates that teaching styles need to take into account the age and gender composition of the students group.

Learning styles and culture.

Culture shapes people, who respond to things in the way that they are conditioned to respond to them. Kennedy (2002) describes culture as " not just a matter of mind over behaviour, it is also the (social) rules, beliefs, attitudes and values that govern how people act and how they define themselves" (p. 430). In this case culture is considered one of the factors which influence students' learning in schools. Nowadays, a typical classroom would contain students from different backgrounds and based on this, current educators have determined that learners from different backgrounds have different learning styles and preferences (Friedman, 2006). Guild (1994) states that "Using information about culture and learning styles in sensitive and positive ways will help educators value and promote diversity in all aspects of the school" (p.21).

The influence of culture on learning styles has been an object of study for many researchers. Dunn et al (1990) conducted a study among a population of African-American, Chinese-American, Greek-American and Mexican-American students. A sample of 300 students from grades four, five and six were selected from different areas of New York and Texas. The researchers used a Dunn and Dunn learning styles inventory (21 elements) to examine student learning styles. ANOVA was used to explore the interaction between ethnic groups on the learning style inventory subscales. The result showed African-American and Chinese-American students differed significantly in 15 of 21 elements. Within African-American and Mexican-American students, the ANOVA showed significant differences in 12 of 21 subscales. The comparison between African-American and Greek-American students showed significant differences in only 9 of 21 elements. The results also indicated that only 9

of 21 subscales were significant between Mexican-American and Chinese-American students. Furthermore, the statistical comparison between Mexican-American and Greek-American students presented the fewest number of significant differences in 6 of 21 subscales. The mean scores on the subscales for the Greek-American and Chinese-American students showed that for only 13 elements out of 21 there were significant differences between the two groups of students. Another study conducted by Tseng (1993) investigated the influence of culture on learning styles among elementary school students. The researcher used a Dunn and Dunn inventory to explore the differences in learning styles among Hispanic-American, Anglo-American and Chinese- American students. Samples of 90 students from grades three and four were used, with 30 students selected randomly from each ethnic group. The ANOVA result showed significant differences between the three groups in four elements of the learning styles inventory. A post hoc study (Tukey's Test) was conducted to further investigate differences between the three cultural groups. Chinese-American students preferred a well-lit study area while Hispanic and Anglo American students preferred faintly-lit study areas. Also, Chinese American students showed significant differences to Hispanic-American students with regards to structure, as the latter needed more precise direction with assignments. Furthermore, Hispanic-American students were significantly different to Chinese-American students on the intake element. The results also showed a significant difference between Anglo- American and Chinese American students in mobility elements.

Ewing and Yong (1992) used a Dunn and Dunn learning styles inventory to determine ethnic, gender and grade differences that existed in the preferred learning styles of gifted African-American, Mexican-American and American-born Chinese students. A sample of 155 gifted sixth, seventh and eighth grade students was randomly selected from public schools in the west and south sides of Chicago. A three-way analysis of variance on raw learning styles inventory scores of gifted African-American, Mexican-American and American- born

Chinese students revealed significant ethnic differences in preferences for noise, light, visual modality, time of study and persistence. Gifted African-American students were motivated, responsible and preferred to study in the afternoon. Mexican-American students were mostly characterized by responsibility, motivation and displayed a more kinaesthetic modality. Gifted American-born Chinese students were persistent, responsible, and they preferred to study in the afternoon and in bright light.

A study conducted by Park (1997a) aimed to explore the different learning styles of high school students in Los Angeles, according to their cultural background. Students from four different cultures were selected; 319 Anglo American, 276 Korean-American, 287 Armenian-Americans and 401 Mexican Americans. The subjects responded to a self report questionnaire of perceptual learning styles designed by Reid in 1987. The questionnaire classified students into six learning style groups; visual, auditory, kinaesthetic, tactile, group and individual learning. The researcher used a MANOVA technique to explore the link between learning styles and ethnicity. Statistically the result showed the main effect of ethnicity was on the auditory, visual, group and individual learning styles. More investigation of the effect between groups was conducted post hoc (Scheffe test). The results showed Armenian-American students were statistically significantly different from Anglo-American students in visual learning style. In addition Mexican-American students were statistically significantly different from Anglo-, Korean- and Armenian-American students in group learning styles. The result also showed Armenian-American students were, statistically, significantly different from Anglo- and Mexican- American students in individual learning styles. Another study was conducted by Park (1997b) to examine the learning styles of students from Asian cultural backgrounds comparing them with Anglo-American students in Los Angeles secondary schools. A sample of 319 Anglos, 276 Koreans, 98 Chinese, 60 Filipinos and 50 Vietnamese students used the Reid learning styles questionnaire. The

MANOVA result showed there was a significant link between ethnicity and learning styles, with statistically significant ethnic group differences in group and visual learning style preferences. The researcher also noted significant differences in the visual learning style preferences between Asian-American students as a whole and Anglo-American students. Specifically, Korean-, Chinese- and Filipino- American students showed minor preferences for visual learning and were statistically significantly different from Anglo-American students who had negative preferences for a visual learning style. The result indicated Vietnamese-American students as having the highest preference for group learning styles while Filipino-American students showed a minor preference for this style, Korean-, Chinese-, and Anglo-American students all had a negative preference for a group learning style.

Language schools are considered good areas to study the effect of culture on learning style. Reid (1987) examined the perceptual learning style preferences of students from different language backgrounds with a learning style questionnaire designed by the researcher. Data for students from nine language backgrounds was analysed. The researcher reported significant differences between student groups, with a post hoc Scheffe test demonstrating that Korean students had a preference for visual learning styles, more so than American and Japanese students (Scheffe test, $p < .05$), while Arabic and Chinese students were found to be strong visual learners. Arabic and Chinese students were also significantly stronger auditory learners while Japanese students tended less towards auditory learning styles (Scheffe test, $p < .05$). Japanese students showed significant differences to Spanish, Arabic, Chinese, Korean, and Thai students they tended to be single learning style. Spanish and Arabic students showed a strong kinaesthetic learning style, while Japanese students did not. Native English-speaking students showed a significantly lower preference for tactile learning style than Arabic, Chinese, Korean, and Spanish students (Scheffe test, $p < .05$). All language groups showed learning within groups as having a minor or negative preference mean.

Furthermore, Native English-speaking students had the lowest preferences for learning in a group. However English speakers showed a strong preference for an individual learning style, while Malay students showed less of a preference for an individual learning style.

The interaction between learning styles and culture within undergraduate students was another object of study for researchers. Investigating the influences of Asian and Australian cultures on learning styles was the purpose of a study conducted by Auyeung and Sands (1996) which used a Kolb inventory with a sample of 632 undergraduate students from four universities: Queensland University of Technology and Griffith University in Australia, Chinese University in Hong Kong and National Chengchi University in Taiwan. Because of the diversity of students in Australia, the study focused on students who identified themselves as having an Australian cultural background. The result showed statistically significant differences between learning styles of students within the four universities. Students from Hong Kong and Taiwan were more abstract and reflective, and less concrete and active. Australian students, however, were more concrete and active, and less abstract and reflective. While Hong Kong and Taiwanese students showed a preference for the assimilation learning style, Australian students showed a preference for the accommodation learning style. The researchers concluded that the diversity of learning styles within students was a result of different cultural backgrounds.

A study by Barmeyer (2004) was conducted to investigate cultural differences in the learning styles of business students in France, Germany and Quebec (French - Canadian). A total of 353 students from the three countries responded to a Kolb inventory. ANOVA was used to determine any significant differences between the three groups and their learning styles. The results showed significant differences in the concrete - experience dimension, with the scores of the French and Quebecois students being greater than those of the German students ($p < .01$). Furthermore, on the abstract-conceptualization dimension the scores of the

German students were higher than the French and Quebecois students, with statistically significant differences (p <.05). Another difference between groups was in the dimension of active experimentation (p< .05). The researcher noted that German and French students did not show any significant differences in dimension of reflective observation.

Charlesworth (2008) used an adapted questionnaire of Honey and Mumford learning style. The questionnaire examined four learning styles; Activist, Reflector, Theorist and Pragmatist. Each style had 20 questions in a six point Likert scale. 34 Indonensian students, 41 Chinese students and 38 French students responded to the questionnaire. The major aim for the researcher was to examine the relationship between learning styles and culture. An ANOVA was used to ascertain if differences between cultural groups would be larger than differences within groups. The ANOVA result showed statistically significant differences in learning styles between three groups for three learning styles out of four - activist, reflector and pragmatist all had a medium effect size. In particular, Indonesian students were low on the activist scale and high on the reflector scale, Chinese students were highest on the theorist scale and had same preference for activist as Indonesian students, while French students leant more towards the pragmatist learning style.

A study conducted by Joy and Kolb (2009) aimed to examine the role that culture plays in the way individuals learn. The study used the combination score of AC–CE (i.e., the cumulative rank for CE subtracted from the cumulative rank for AC) to represents the preference for abstract conceptualization over concrete experience and AE-RO (i.e., cumulative rank for RO subtracted from the cumulative rank AE) to represent the preference for active experimentation over reflective observation. The sample of 533 students from seven countries responded to the Kolb inventory. The ANOVA showed significant interaction between cultures of seven countries on AC-CE (F value = 2.93, P = .008) with culture

explaining 2% of the variance. There was no significant interaction between culture and AE–RO.

To examine impact of cultural factors on learning style preferences in Middle-Eastern students, Zualkernan, Allert and Qadah (2006) conducted a study to determine whether students from different cultures have different learning styles. The participants in the study were studying computer programming and engineering. The first group of participants consisted of 69 students studying at an American Midwestern University in the United Arab Emirates, while the second group consisted of 61 students from an American background. Both groups responded to the Felder Solomen index of learning styles. The researchers used t-test to compare the groups. The result showed no significant differences in learning style between Middle Eastern and American computer science students.

Although previous studies have used different measurements and examined various cultures at different ages, academic levels and from different nations, they revealed similar results regarding the effect of culture on learning style. As a result, using various teaching methods when teaching to different cultural classrooms is required in order to fit different learning styles.

Learning Style and Academic Achievement

In addition to gender, age and culture, academic achievement has also been investigated to determine if it has any influence and effect on learning style preference. Nolting (2002) emphasized that students' academic achievement positively increases if they are aware of their learning style and how they learn best. The relationship between learning styles and academic achievement in different level of education was examined by researchers.

A study which evaluated the relationship between learning style and students' academic achievement was conducted by Wallace (1992) at four elementary schools in suburban Syracuse, New York. The study aimed to evaluate the achievement of elementary

school students who preferred learning alone or with peers. A sample of 114 students was selected from grades three, four and five to respond to the Dunn, Dunn and Price learning styles inventory in the first phase of the study. Then, 17 students who strongly preferred learning alone and 17 who strongly preferred learning with peers were selected for the next stage of the study. The student participants were introduced to a small group learning method and were given five lessons with the option of working alone or with peers each time. An ANCOVA was employed to evaluate the result which showed statistically significant differences between the two groups. Students who preferred to learn alone achieved significantly higher mean scores than students who preferred to study with peers. Students who strongly preferred to learn alone did not achieve significantly higher scores when they opted to learn alone, also students who strongly preferred to study with peers did not achieve significantly higher scores when they opted to learn with peers. Also Collinson (2000) conducted a study among elementary students to investigate the influence of learning style on academic achievement. The sample of 110 students was selected randomly from grade three, four and five public school students. The researcher used a learning style inventory developed by Dunn and Dunn to assess students' learning styles. Academic achievement of students was based on Stanford Achievement Test (SAT) composite scores obtained from student cumulative folders. A one way ANOVA was used to measure the relationship between learning style and academic achievement. The results showed significant differences between academic achievement with three out of twenty two learning style elements. The study concluded that low achievers prefer to learn in a formal classroom with peers during the afternoon, whereas high achievers preferred studying along with self-directed objectives.

Yazicilar et al. (2009) conducted a study among fifth grade students in a social studies class to determine the relationship between learning style preference and academic achievement. A sample of 50 students participated in the study, divided into an experimental

and a control group. The experimental group were those who received an educational included audio, visual and teaching practices materials, while the control group received educational using teacher centred and primary school program methods. The results showed significant differences between the experimental and control groups in terms of academic achievement and retention.

A study by Bahar (2009) was conducted among 14 year old seventh grade students to examine the relationship between learning styles and performance in mini science projects. A sample of 80 students from two different primary schools responded to a Grasha – Riechmann learning style scale. This instrument consisted of 60 items with a five point Likert scale to evaluate six learning styles; competitive, collaborative, avoidant, participant, dependent and independent. A MANOVA was conducted to examine the relationship between students' learning styles and their academic achievement in the mini projects. The result showed a statistically significant connection between learning style and performance in mini projects. The study was able to determine that those who belong to high achiever groups were independent, competitive and participative in nature, while those who had relatively lower achievement level were avoidant, dependent and learned best in collaborative groups.

Matthews (1996) conducted a study to evaluate the relationship between the academic achievement of high school students and learning styles. Nineteen high schools were selected from rural, urban and suburban areas of midlands, northern and southern of Soth Carolina. A sample of 6218 students was asked to complete the Kolb inventory and a demographic questionnaire from which the researcher obtained data on each student's assessment of their academic achievement. The academic achievement used self ratings with students determining their achievement in one of five categories; excellent, good, average, fair and poor. Data from 5835 students were used for this study. The result showed a significant effect between learning styles and the ratings of students with regards to perceived academic

achievement. The convergent style had a higher mean (M= 3.60) on rating than accommodative, assimilative and divergent styles. High achievers tended to be convergers, while low achievers tended to be divergers. Students who attended mathematics and science groups in high school were the focus of research conducted by Ozkan (2003), who investigated the influence of learning style on academic achievement. A cluster random sampling method was used to select 980 students who responded to the Kolb inventory. The resulting ANCOVA showed significant differences between student learning styles and academic achievement in biology. The study noted that students who depend on an assimilative learning style to gather and use information were more successful than divergers, accommodators and convergers according to their academic achievement in biology tests.

Some studies were conducted to explore the learning styles of high and low academic achievement students. Hlawaty (2008) compared three academic achievement groups (low achievers, high achievers and gifted) and learning styles based on Dunn and Dunn learning style theory. The MANOVA identified significant differences between the three academic achievement groups. Furthermore, the MANOVA result showed significant differences among all three pair-wise combinations of the achievement groups. The study reported that gifted students were less parent and teacher motivated while high and average students were more mobile, and low achievement students were more authority and teacher-oriented. Jackson- Allen and Chirstenberry (1994) conducted a study to compare the learning style preferences of low achieving African – American male students with those who were high achieving. The study selected 131 freshmen and 96 sophomores from grades 9 to 12 at a southern urban high school. The study divided students according to the average marks of students in core academic courses (English, science, history and mathematics). Students with an average below 70 were considered as low achieving and those with an average above 80 were considered as high achieving. A Dunn and Dunn learning styles inventory was

conducted to determine students learning style. A t- test was conducted to examine the differences between low and high achieving auditory, visual, tactile, and kinaesthetic learning styles. The t-test results showed no statistically significant differences (p .05) between the two groups on auditory, visual, tactile, and kinaesthetic elements of learning styles whereas motivation, mobility and parent motivated factors showed significant differences at the .1 level. The post hoc analysis indicated that students in low achieving groups were less self motivated than high achieving groups, Furthermore, low achieving students needed a more active involvement in their learning experiences and they had less desire for academic achievement.

Park (1997a) found significant differences among high achieving, middle achieving and low achieving students based on a Reid learning style questionnaire. The researcher used a preference mean of 18 and above = major, 16.50 and above = minor and 16.49 or less = a negative preference. The study found a statistically significant relationship between academic groups and learning styles. Furthermore, he observed that students from high and middle achieving groups preferred an auditory learning style whilst the low achieving group had only a minor preference for auditory learning. For a visual learning style the high and middle achieving group had minor preferences whereas the low achieving group had a negative preference. The low achieving group preferred learning in a group style while the high achieving group had a negative preference for this style. The high achieving group had a major preference for an individual learning style; while the low achieving group had a negative preference for the individual learning style. He concluded that “high achievers appear to have multiple learning styles preferences” (p.106).

Another study was conducted by Crosley (2007), to compare student achievement of those who attended traditional classrooms with those who attended multisensory classrooms. The researcher used a multisensory instructional package to determine the sensory styles of

the students. A sample of 282 middle school students was divided into a control group with traditional teaching techniques and a test group with multisensory teaching. Students in the multisensory instructional classroom were taught using an instructional strategy incorporating self-correction, task cards, electro-boards, pic-a-holes, flip chutes (a kinaesthetic floor game) and programmed learning sequences. A pre-test was conducted with both groups, after which students learned three units of science using the teaching technique of each particular group and were tested on their knowledge. Then, the researcher switched the groups so that the control group learned the next science units using a multisensory technique and the students who were in the test group learned the same unit using traditional teaching techniques. Students in both groups also took pre and post tests to assess their learning. The ANOVA result showed a positive and significant impact on achievement with students learning more and having a better attitude to learning when they were in the multisensory classroom.

The link between academic achievement of undergraduate students and learning styles was the subject of a study conducted by Jones, Reichard and Mokhtari (2003). A sample of 103 college students responded to an adapted Kolb inventory, as well as the original Kolb inventory. Students were measured in four disciplines: English, science, mathematics and social studies. The researcher modified the Kolb inventory to be discipline - specific with each of the 12 questions re-written to include the names of particular disciplines. The ANOVA was conducted to determine the interaction between learning style and the academic achievement of students (using GPA average) and the result showed significant differences for overall GPA and learning styles. The students with highest GPA were assimilators while students who were lowest GPA tend to were the divergers. Mckee (1995) used the Kolb inventory to investigate the interaction between learning style and academic achievement among 709 undergraduate students using the grade point average after 15 credits, and 75 credits. The grade point average for the major course was collected for each student from the

institutional data base. The result showed a small, statistically significant relationship between learning styles preference and academic achievement. Furthermore, no relationship between learning style preferences and first term and fifth term academic achievement was found. Students who were not in good academic standing preferred reflective observation style more than students who were in good standing.

Kia et al (2008) noted that "academic achievement of students with different learning styles is different" (p, 32). Kia et al. found high academic achievers have social, aural and solitary learning styles, while low achievers use logical and physical styles. Cano-Garcia and Hughes (2000) investigated the influence of learning style on academic achievement among 210 college students using a Kolb inventory. The researchers used regression to assess the interaction between learning style and academic achievement. The regression analysis predicted that students showing a preference for concrete experience learning style would have the highest level of academic achievement. Also in 1999 Garton, Spain, Lamberson and Spiers found a low positive relationship between student learning styles and student's achievement. Alkhasawneh et al (2008) indicated that students with multimodal learning styles achieve higher than other.

In 2006, Abdulkadir et al. used a Kolb inventory to evaluate the interaction between learning styles and academic achievement among secondary school students in Malaysia. A sample of 241 students from two urban secondary schools participated in the study. Students were grouped based on academic achievement, with 123 students in the high achievers group and 118 in the low achievers group according to their results in the Malaysian public school examination. A t-test analysis was conducted and the results did not show any significant differences between high and low achievement groups. Abdulkadir et al. justified this result because students in secondary schools are exposed to a limited variety of experiences in their learning process. Fox and Bartholomas (1999) studied the relationship between learning style

and academic performance of 419 undergraduate students who were enrolled in four introductory family financial management courses. A Kolb learning style inventory was used to assess the learning styles of participants. Students were divided into three categories according to their GPA; low, middle and high. Low category students had a GPA of below 2.3 and made up 22% of the sample while students in the high category had GPA of 3.3 or above consisted of 24% of the sample. In this study, the Kolb learning style inventory was unable to determine a significant relationship between learning style and academic achievement. A study by Roig (2008) was done among biology students at a South Florida multicultural college. A sample of 162 students was selected by choice of subject classes. Data was examined using Felder – Soloman learning styles with the faculty supplying the researcher with final student grades at the end of the course. Students preferred sensing, visual and sequential learning styles. The ANOVA was used to assess the mean differences between academic achievement and learning styles with results showing no significant difference. The study also concluded that, no relationship existed between preferred learning styles and acadmic achievement.

Most of the studies indicated learning styles as the factor which has greatest effect on students' academic achievement. However, researchers should be aware of other factors such as motivation to learn and age which may have more effect than learning styles.

Learning Styles and Reading Achievement

The learning styles of students are uniquely diverse due to differences in their reading strategies. Corcos and Willows (2009) noted that the reading performance of readers may be attributed to the cognitive perceptual mechanisms that are required in order to carry out the activity of reading. Several studies have been conducted to investigate the relationship between learning style and reading achievement.

Price, et al. (1981) conducted a study among elementary school students to explore reading achievement and learning style. Thirteen students from grade three and seventy two from grade six responded to New York state's Pupil Evaluation Program (PEP) in reading and a Dunn and Dunn learning style inventory. Students were divided into two groups, high and low reading achievement, according to their mean reading score. The result showed significant differences between high and low reading achievers in eleven elements of learning style. The study showed different characteristics between high and low reading achievers. Students in the high group did well in indistinct light and were self-motivated. In addition, they learned to satisfy themselves and were persistent and aware of their responsibility. They preferred not to study in late morning, enjoyed eating while studying, and liked mobility, but they preferred not to use tactile or kinaesthetic factors to learn. Students with low achievement preferred an informal and brightly lit environment to study and waited for adults to motivate them to study. They preferred to learn through their tactile and kinaesthetic senses and preferred studying in late morning. Carbo (1983) conducted a study using the reading style inventory, consisting of eighteen elements based on the Dunn and Dunn inventory. A sample of 293 students from grades two, four, six and eight were divided into three groups, poor, average and good, according their level of reading achievement. The ANOVA result indicted that tactile and kinaesthetic styles were favoured by poor readers, while good readers exhibited significantly greater visual and auditory preferences. Caldwell et al. (1996) used Dunn's inventory and the Taxes Learning Index (TLI) in reading and maths to compare low and high achieving students with low socioeconomic status. A sample of 60 third and fourth grade students was studied. The number of boys and girls was equal in the sample. The result showed significant differences between high and low achieving groups in their learning styles. Students in the high group showed high motivation, persistence, were more responsible and more aware of teacher motivation.

Research into learning styles and reading continued with Foley (1999) who described the effect of students' learning style on their reading achievement. In her study, 106 third grade students responded to a Dunn and Dunn inventory. The researcher measured reading achievement by using the Texas Assessment of Academic Skills (TAAS). This test has a variety of different types of passages which represent four basic purposes of language (informative, persuasive, literary and expressive) and four basic modes of organization of language (description, narration, classification and evaluation). A t-test was used to evaluate the link between elements of learning style with students' reading achievements. Results showed statistically significant differences between low and high reading achievers, as students in the high group were more persistent and took more responsibility. Leone (2008) evaluated the effects of more versus less congruent parental learning styles on the vocabulary achievement, comprehension and attitudes of elementary students. 84 boys and girls from grades four through six and 158 parents participated in the study . The researcher analysed learning style elements through two very different frameworks; model one examined the effects of more-versus less congruent learning styles using only select learning style elements, and model two examined effects taking into account all 21 comparable learning style elements to determine if a more comprehensive examination might reveal discrepant results. The t-test results showed no statistically significant increase in the number of correct items on the vocabulary achievement test scores of students who received homework support from the parent whose learning style preferences they were more congruent with, as opposed to the parent whose learning style preferences they were less congruent with, for all participants according to model one and two.

Investigating the effect of teaching remedial readers according to their learning styles was the purpose for the study conducted by Brooks (1991). The sample consisted of forty two students from two elementary schools, from grades two through six, who performed at the

36% or lower level on reading achievement tests and attended the remedial reading program. 22 students were put in the experimental group, while 20 were put in the control group. Reading achievement in both groups was determined in a pre-test using the Spadafore Diagnostic Reading Test. Students in the experimental group responded to Reading Styles Inventory as thus: 19 students were considered to prefer the tactual-kinaesthetic style, as they learnt most effectively through tactual-kinaesthetic reading instruction. One student demonstrated a preference for being taught by auditory reading instruction, and two students demonstrated a preference for being taught by visual reading instruction. The tactual-kinaesthetic reading instruction consists of writing assignments, reading games and dramatics. Auditory reading instructions consist of recorded books. Auditory students' were asked to listen to the tapes and move their fingers under the word being spoken. Visual reading instruction consists of flashcards for vocabulary, filmstrips and computer. The control group did not receive reading instruction according to their learning styles. The post-test was utilized for both groups. The pre-test versus post test results were significant in oral, silent and listening comprehension reading for the experimental group. Furthermore, the significant differences between experimental and control groups were evident in scores on the post-test for oral, silent and listening comprehension reading. Students in the experimental group tended to achieve higher than the control group. This result showed the effect of using activities and instructions that match students learning styles on their reading achievement.

Some researchers have shown interest in investigating the effect of one or more elements of Dunn's inventory on students' reading achievement. For example, a study was conducted by Pizzo (1981) to investigate the relationship between the auditory element of learning style and the reading achievement of students. The sample consisted of 125 grade six students, who were asked to respond to Dunn's inventory in order to diagnose their preferences for sound in an acoustic instructional environment. Only sixty-four students (32

male and 32 female) comprised the sample population for the investigation. Students were divided into two subgroups - those who preferred quiet and those who preferred sound. They were then further divided into four groups based upon their sex. A sample of 16 male and 16 female subjects were diagnosed as preferring quiet, and 16 male and 16 female subjects diagnosed as preferring sound in an acoustic instructional environment. Subjects were then randomly and equally assigned to one of the two conditions, quiet or noisy, that was congruent with their learning style preferences for sound; while half were randomly and equally assigned to one of the two experimental conditions that was incongruent with their learning style preferences for sound. In the noisy instructional environment, an audio recording of classroom noise was made while students in the sample school were engaged in a team learning activity. The researcher used the Gatest-MacGinitie reading tests to measure important knowledge and skills that are common to school reading curricula. The result showed that were no significant differences between students who tested in quiet conditions compared to students who were tested in noisy conditions.

Another study was conducted by MacMurren (1985) to investigate the influence of the intake learning style element on reading achievement. A sample of 173 grade six students from two elementary schools in New Jersey responded to Dunns' inventory. In the second stage of the study 40 students who scored either between 20-40 or 60-80 on intake element in the inventory were studied. Students were assigned randomly and equally to two experimental groups - one with an intake environment and another without an intake environment. In each group half the students had strong preferences for the intake element whilst other half did not. A standardized achievement test and a semantic differential scale were administered to both groups. The researcher used the Iowa test of reading skill to measure the reading achievement of students. The ANOVA result was significantly higher in reading achievement ($p < .01$) for

students whose preferences for intake were matched compared to those students whose preferences were mismatched.

Virostko (1983) examined the relationship between students' preferences for times of day and their instructional schedules in reading and maths. The researcher used Dunn's inventory to explore students learning styles and the Metropolitan Achievement Test in reading and mathematics to evaluate students' achievements. According to the results in relation to preferred time using Dunns inventory, 286 students in grades three and four were divided into two groups. The first group consisted of students who had reading class scheduled during their preferred reading time ,while the other group consisted of students who studied reading at a time other than that which they preferred. The study lasted two school years. The ANOVA was used to measure the link between the preferred time of students and their achievements in reading. The results were significant ($p < .01$), with greater achievement in reading for students whose time preferences for reading coincided with their scheduled reading time when compared to those students whose identified time preferences did not coincide with scheduled reading time.

Clyne (1984) conducted a study to evaluate the effect of learning style on Alaskan native students and Anglo students from grades four through six. The researcher also used Dunn's inventory to assess the learning styles of students and the Iowa Tests of Basic Skills (ITBS), which provides multiple scores in the subject areas of vocabulary, reading and language arts skills, study methods and mathematics. A sample of 141 native Alaskan students and 478 Anglo students were involved in the study. The Pearson result showed a strong and significant relationship between two elements of learning style inventory (noise level and responsibility) and the reading achievement of Alaskan native students. The results showed that high achieving native students were more responsible and preferred higher sound levels, whereas native students who preferred a lower noise level with less responsibility

tended to achieve lower scores. The results also showed that the reading achievement of Anglo students had positive correlation coefficients with six elements of learning style (noise level, motivation, persistence, responsibility, intake and adult motivation) and negative correlation coefficients with four elements of learning style (authority figures present, learning in several ways, late morning and mobility).

Littin (2002) conducted a study to evaluate the relationship between reading achievement and learning and cognitive styles, hemispheric preferences and gender for urban elementary school students in Brooklyn, New York. A sample of 253 students from grades three through five participated. The researcher used the Citywide Reading Test (CBT Reading) to assess students reading achievements for all grades. This test categorizes students according to their scores in one of four quartiles. The first and lowest quartile consisted of students scoring between 1and 25 %, the second ranged from 26 to 50 %, the third from 51 to 75 % and the fourth and highest quartile ranged from 76 to 99 %. Dunn's inventory and Our Wonderful Learning Style (OWLS) were used to assess the learning styles. The OWLS resulted from the collaboration of Guastello and Dunn (1998). The inventory used stories, pictures, imagery, fantasy humour and imagination. Each of the five stories incorporated the categories found in Dunns' inventory. The first story, "Fun in the Forest Museum" assessed physiological, sociological and environmental elements. The second story, "New Friends in the Forest" assessed physiological, sociological and emotional elements. The third story, "A Lesson for Raintree" assessed physiological, sociological and environmental elements. The fourth story "Waking Up that Wendle" assessed physiological, emotional and environmental elements. The fifth story, "Getting it Done Your Way" assessed physiological, sociological and emotional elements. OWLS also assessed the psychological categories of global/analytic processing and impulsive - reflective. The ANOVA result showed a significant relationship between reading achievement and learning style. According to Dunn's inventory, tactual and

kinaesthetic elements were preferred styles for students in the second quartile, while students in the first quartile preferred warm environments, external motivation and self structuring. The Pearson also showed positive correlations between learning style and reading achievement, with high level readers showing preference for learning styles elements such as persistence, intake, late morning study period, and close work with teachers. Negative correlations between low level readers and learning styles elements included early morning study periods and external motivation.

The relationship between reading achievement of disabled students and learning styles was the aim of a study conducted by Lashell (1986). The sample consisted of 90 students diagnosed as having a learning disability by a certified school psychologist. The selected students were in grades two through six in two separate schools. There were 47 students in the experimental treatment group and 43 in the control group. Students' reading achievement was assessed at the beginning of the year (pretested) and the end of the year (post tested) by the Gray Oral Reading Test. The researcher also used Reading Style Inventory to identify individuals reading style preferences and strengths of students when they read. The teachers of the treatment group took a one week training course on learning styles followed by two weekend courses on reading styles. Students in the treatment group were classified and taught according to specific reading styles. The instructional methods used for the treatment group was phonics-linquistics, orton-Gillingham, whole word, individualized, language experience, Fernald word-tracing method, and Carbo recorded books. The materials used included games, recorded stories, dramatic plays, simulations, book from different strands of literature, basal readers, audiovisual materials, workbooks, reading kits, and activity cards. The results showed that the treatment group students achieved three times more than the control group during one school year. The result also represents a significant increase in the internal locus of control when reading style was matched with learning style, with a significant decrease when

reading and learning styles were mismatched. The study also showed significant effects on reading achievement when the reading method and materials are designed to match students' strengths of students. It also indicated that more than half of the learning disabled students were global – tactual learners.

Schuchardt (1987) conducted a study to determine the effect of teaching students according to their learning styles. A case study research method was used in this study. The researcher selected two students whose reading achievement was below their expected grade level, one being classified as A, and the other as B. The reading achievement of students A and B was behind rest of the class by six and eight months, respectively. The researcher used Reading Styles Inventory to determine the students' learning styles. The reading achievement of students A and B was determined at the beginning and end of the study by use of the Informal Reading Inventory and Minimal-Grade Competencies: Reading 2 test as the pre-test and post-test. Both students were provided with reading resources, activities and a reading lab that fit their learning styles. The result showed the improvement in reading achievement for both students in Minimal-Grade Competencies: Reading 2 reading skills.

The relationship between learning styles and high school students' reading achievement was examined by Murray (1980) who administered a Dunns' learning style inventory to identify learning styles of students in grades seven and eight. The sample consisted of 61 low level reading achievers and 61 high level reading achievers. There were 31 students from grade seven and 30 students from grade eight in both the low and high achievement groups. The researcher divided students according to reading achievement based on the Houghton Mifflin reading series. Students who achieved two or more years above grade level in reading were considered as high achievers and students who achieved two or more years below grade level were considered as low achievers. A t-test was used to determine any significant difference between low and high reading achievement and learning

style. The T-test results showed a statistically significant difference between two groups in six elements of Dunns' inventory (self motivation, lack of motivation, responsibility, need for structure, learning alone or learning with an adult). The data indicated low reading achievers were less motivated, needed more structure and needed adults to assist in learning, while high reading achiever were more responsible, motivated and preferred learning alone.

Williams (2010) conducted a study to determine the relationship between sensory learning style (kinaesthetic, tactile, auditory and visual) and reading comprehension. A sample of 343 Grade 7 students from two schools responded to the research measurements. The researcher used a Kaleidoscope profile designed by Haggart (1998) to assess the sensory learning style of participants and the Scholastic Reading Inventory to assess participants' lexile levels. The Scholastic Reading Inventory classifies students according to lexile scores at five levels; beginning reader, far below grade level, below grade level, on grade level and above grade level. The chi square result showed a significant relationship between sensory learning style (kinaesthetic, auditory and visual) and reading comprehension level. The ANOVA results also represented significant differences in auditory kinaesthetic and visual learning styles between students who struggled in reading and students on grade level. The result also showed a significant distribution for students with below grade level reading comprehension on kinaesthetic and visual styles. The study also confirmed the relationship between sensory learning styles and reading comprehension.

Hainer (1987) conducted a study with high school students to investigate the relationship between learning styles and reading achievement. The researcher used a Kolb learning styles inventory to assess students learning style and the Adult Basic Learning Examination (ABLE) to assess reading achievement. Significant correlations were only observed between students' reading achievement and reflective observation. Queitzsch (1990)

found a strong correlation between learning styles and reading achievement among high school students based on learning styles inventory (NASSP).

The relationship between learning styles and reading achievement in elementary and high school students was examined in the previous studies. According to age range in this level of education, most of the researchers depended on Dunns' inventory to determine students learning styles. There was agreement that low achievers studied have different learning styles than high achievers. The kinaesthetic learning style was a common style for all low achieving students according to Price et al. (1981) , Carbo (1983) and Williams (2010), while high achievers were more persistent and responsible, whilst also capable at visual and auditory learning.

Learning Style and Teaching

Understanding and being aware of student learning style preferences is an important factor for teachers in schools. O'Connor (1997) showed that learning styles provide teachers with new ideas for changes in their classrooms and opened the classroom to different approaches to intellectual work. Also, Guild et al. (1998) asserted that when a teacher is aware and accepts that there is a diversity of learning styles within the learning environment it consequently creates an atmosphere wherein students are individually encouraged to reach their full potential. Whittington and Connors (2005) noted that lesson plans are commonly prepared on a general basis and may not accommodate the special needs of students. Pizzo (1981) and McMurren (1985) determined that students have a relatively higher academic achievement when their learning style preferences meet the teaching methods, but have low academic achievement when the teaching method is not compatible with their preferred style of learning.

A study was conducted by Isom (1997) to investigate the relationship between learning styles, teaching methods and academic achievement. The researcher used a Kolb

inventory to assess 43 nursing students, with students being divided into two groups, A and B. Selected content was taught to group A by the lecture method and group B by the case study method, and then a different selection of content was taught to group A by the case study method and group B by the lecture method. The mean achievement scores on the post-test and grade point averages were used as measures of achievement. The ANOVA result showed a significant effect between learning styles of participants and teaching methods (lecture and case study).

In addition Lindsay (1999) conducted a study based on the Kolb inventory that examined the effect of teaching, learning styles and educational technology on achievement and satisfaction of students. The participants in the study were 107 students and six instructors. The study design included six sections, three of six were with modern educational technology (e.g. multi-media computer presentation, CD-ROMs, liquid crystal panels, colour transparencies, PowerPoint presentations, digital photography and videos) and the other involved the use of traditional technology(e.g., chalk and chalkboard, flip charts, black and white overhead transparencies and lecture notes and handouts). The instructors were categorized according to the Kolb inventory into three groups; two groups of divergers, two groups of assimilators and two groups of accommodators. Students were distributed randomly to the six sections. Pre-test, post-test and final exams for the Exploring Leisure Alternatives course were administrated to measure achievement. The ANOVA result showed that teaching and learning styles had a significant effect on students' achievement. Students who matched their teachers teaching styles and had the enhancements of emerging educational technologies demonstrated significant achievement gains on both midterm and final term. Furthermore, in the traditional teaching sections, significant increases in achievement were found for students whose learning styles match those of their instructors. Another study was conducted among 190 physical therapy students by Olson (2000) to evaluate the relationship between learning

style, teaching methods and instructional activities. The researcher used a questionnaire for preference scales, including teaching methods and instructional activities, and the Gregorc Style Delineator to assess student learning styles. The teaching methods questionnaire consisted of four teaching methods (collaborative, self-directed, detailed and structured methods).The researcher used a correlation analysis between the four scales on Gregorc scale and students scores on the teaching methods with alpha level at .05. The result showed a significant relationship between collaborative teaching methods and two learning styles, abstract random dimension and abstract sequential dimension. Furthermore, a strong positive correlation was found between preferences for self directed teaching methods and concrete random learning styles. The relationship between structured teaching methods and concrete sequential learning styles also represented a positive correlation, while there was a negative correlation between this teaching method and concrete random learning styles. The study reported no significant differences in instructional activities and learning styles groups. Another study by McClogin (2000) used Grash-Reichman inventory to examine the effects of matched versus mismatched learning styles. teaching methods and students' academic performance. The study focused on first year nursing students - three nursing courses were selected and each course taught by different method. A sample of 77 students was used with 33 students taught using the lecture method, 32 taught by the collaborative method and 12 students taught by an independent method. Furthermore, students were evaluated using Instructional Report II and their achievement was measured by averaging all exams administered during the course. A regression analysis was used to predict the relationship between matched or mismatched learning styles and teaching methods with students' achievement. The result indicated that a match between learning styles and teaching methods did not prove to be a significant predictor of a student's academic achievements. Similar results were found in the study of O'Brien et al (1994) based upon a Gregorc delineator. They

indicated that students who were mismatched with the teaching styles of their instructors tended to have higher achievements.

Alkhasawneh et al. (2008) aimed to assess whether problem based teaching methods had an impact on students learning styles, based on the VARK theory. The t-test result showed a significant difference between VARK groups using problem-based learning teaching methods, particularly with students who preferred a multi-modal learning style.

Hong (2005) conducted a study to examine the impact of teaching methods and learning styles on students' learning methods via online instruction. The study used a convenience sample consisting of five teachers in five online biology courses and 195 of their students. The researcher used web sites to collect data. Three instruments were sent via the internet to participants. Teachers responded to the Teaching Approach Inventory at the beginning of the semester to measure the ways teachers approached their teaching in a particular situation. Students responded to the Kolb inventory and Study Process Questionnaire to assess the different approaches used by students to learn and also assess the three motives and strategies consisting of those approaches (the surface approach and deep approach). The ANOVA was conducted to examine the impact of teacher approaches to teaching and learning styles on deep and surface approaches to learning. The result showed there were no significant differences among the four Kolb learning styles with deep and surface approaches to learning.

Davidson (2000) studied the interaction between teaching methods and the learning styles of high school students. A sample of 112 students enrolled in the required computer applications course participated in the study. Students responded to three measurements: Spreadsheet Declarative Knowledge Test (SDKT) developed by the researcher and participating instructors; Computerized Procedural Skill Test (CPST) to assess students' spreadsheet skill level; and Group Embedded Figures Test (GEFT) to assess students'

dependent and independent learning styles field. The learning styles inventory, information sheet and declarative knowledge pre-tests were done on the first day of the spreadsheet unit. Students were categorized into two groups, A and B and they used the same textbook. Group A students received the guided-practice activities where they were guided step by step through the chapter's objective and practices and given a schedule of end of chapter exercises. This schedule required that the students complete specific exercises at a designated pace. Students in group B received the supervised-practice activities where they were given a brief lecture and demonstration on the first day of the spreadsheet unit covering the objectives. Also they were asked to complete the chapter practices and end of chapter exercises at their own pace. Both groups completed the same practices and exercises during four weeks then completed the SDKT post test and CPST. The ANCOVA and MANCOVA results showed no significant interaction between teaching methods and students' learning styles relative to declarative knowledge and procedural skill level in the spreadsheet unit. Jackson (2001) examined the achievement, attitudes and retention of microbiology students. Two groups consisting of 52 students participated in the study. One group was taught using the 4MAT model and the other taught by traditional method (lecture). The students' knowledge of microbiology was assessed through pre and post-testing at the beginning and the end of the semester. The ANCOVA result showed significant difference was found on achievement, attitudes and reiteration in the 4MAT group. The interaction between learning styles and instructional methods was negation. The result also reported no significant in gender according to achievement, attitudes and reiteration.

A study by Powell (1987) investigated the effect of teaching methods on elementary students who preferred one of several perceptual learning styles in relation to mathematical achievement. Students from grades three and four responded to Dunn's inventory. Participants were categorized into an experimental group and a control group for each grade. Third grade

participants in the experimental group consisted of 3 auditory students, 7 visual students, 3 tactile students, and 11 kinaesthetic students, with 16 students in the control group. Fourth grade participants in the experimental group consisted of 3 auditory students, 9 visual students, 3 tactile students, and 4 kinaesthetic students, with 14 students in the control group. Teachers who taught the experimental group were instructed to teach new information according to their strongest perceptual preference. Lesson plans were formulated and discussed weekly with the researcher. Instructional areas in the two experimental groups included learning stations, an interest centre, a game table, magic carpets and a media corner. The control groups were taught concepts and skills using a directed maths lesson approach. Students' achievement in mathematics was assessed at the beginning and end of the study by Metropolitan Achievements Test mathematic subtests. The ANCOVA indicated to the signification differences between auditory students in grade four. Furthermore, no significant differences between other learning styles groups were found in grade four and all learning styles groups in grade three.

Matching students' learning and their teachers' learning is considered the basis for enhancing students' achievement. Goodwin (1995) linked the level of students' achievement in the classroom to the compatibility of students' and teachers' respective learning styles. Murphy (1990) conducted a study to investigate the relationship of matched and mismatched learning styles with selected learning style characteristics of students (tactual and kinaesthetic) and their teachers in relation to student achievement in reading comprehension. A sample of 120 students from grades two through to five participated in the study in addition to 22 reading teachers. Teachers responded to two instruments of the study: A Reading Style Inventory for adults, and a Gregorc style delineator. Teachers' preferences for tactile and kinaesthetic styles were identified from responses to the reading style inventory for adults. A student sample responded to The Reading Style Inventory and the reading comprehension

subtest. They were categorized into two groups, either ‘matched’ or ‘mismatched,’ based on comparisons of students and teachers. Tactile styles were reported as strong, moderate or mild while kinaesthetic styles were reported as strong or moderate. Students’ learning styles matched their teachers’ learning styles when they shared the same descriptor (strong, moderate or mild) for each element of reading style. A t-test analysis was used to examine the effect of matched and mismatched learning styles of students and teachers on reading achievements. The result showed that there was no statistically significant difference between matched or mismatched students and teachers on reading comprehension scores. In addition, there was no significant relationship between perceptual learning styles and gender.

A study by Alsan (2009) determined that the teaching style preference of teachers can directly impact the level of academic achievement of students. The study was conducted among general chemistry laboratory students and a Grash-Reichman learning styles inventory was used to gather data. The result of the study showed that a majority of the surveyed respondents demonstrated an avoidance teaching preference, and that such a preference causes low academic achievement among independent learners.

Cafferty (1981) conducted a study that focused on grade point average as the data for academic achievement. A sample of 44 teachers and 239 high school students participated in the study. The results of the study showed that there was higher grade point average from students whose learning styles matched the teaching methods used than those whose learning style did not match the way the content was delivered. Moreover, the study determined that the greater the mismatch between learning style and teaching method, the more the grade point average decreases. Jacobsen (1988) also conducted a study to examine the relationship between matched or mismatched learning styles of students and their teachers. Ten teachers from two schools participated in the study, and 160 students were identified as being enrolled in their classroom as the first time. Each student was rated on a five- point scale by the

teachers as to expected level of achievement. A Kolb inventory was conducted to determine the learning styles of teachers and students, and regression analysis was used to examine the relationship between matched or mismatched students and teacher learning styles with expected and actual student achievement. The result showed a significant relationship between achievement when students learning styles matched or mismatched their teacher's learning style.

A study conducted by Roark (1986) compared reading comprehension scores of high and low ability grade four and six students when their learning styles matched or mismatched their reading teachers. Furthermore, the study looked at the effect of isolating one element of learning style on reading comprehension. A sample of 550 fourth and six grade students and 24 teachers at nine elementary schools participated in the study. The researcher used several instruments: the Productivity Environmental Preference Survey was used to determine teachers learning style, while the Learning Styles Inventory was used to determine students' styles. The Science Research Associates Achievement Series was conducted at the beginning to assess student's ability and the student's reading comprehension was assessed by a comprehension subtest of the Stanford diagnostic Reading Test after they had received reading instruction for one semester in regular classes. A three-way analysis of variance was used to examine the study hypothesis and the result showed a significant interaction when students learning styles matched their reading teacher's learning styles - they achieve highly in reading comprehension, especially when students match with teachers in terms of authority figure orientation. The study also mentions that matching students' and teachers' learning styles may not always increase students' achievement.

Matching between students' learning styles and teachers' learning styles in the field of special needs education enhanced student outcome. Foriska (1992) took a different approach in emphasizing the vitality of identifying learning styles and matching them to the teaching

method in order to increase the quality of learning. The researcher used the National Association of Secondary School Principals' Learning Style Profile (LSP) in identifying student deficit, specifically in cognitive skills. Through this method, it was identified that seventh grade students in the study had deficits in the areas of sequencing and memory. After identifying students' deficits, an educational intervention was performed, the results of which showing that there was a significant difference between the academic achievements of those who received an educational intervention and those who did not. This implies that teachers are in a position to make learning experiences better for students, which would consequently increase their academic achievement.

Foley (1999) states that some researchers emphasize the development and modification of students' learning styles while some state that students should be taught through their strengths. The majority of prior studies illustrated that students' reading achievement improved when reading resources and reading teaching methods were modified and designed to be compatible with students' learning styles. The result emphasises the importance of proper assessment and understanding of learning style and the factors that impact on the ability to learn.

Stability of Learning Styles

While it is possible to determine the essential features of a learning style, it should be noted that the learning process varies for an individual over the passage of time. Thus, individual learning styles may also change over the time (Church, 2004). Robotham (1999) asserted that once students develop a learning style, they tend to refine that style based on three factors: unconscious modifications made by the learner themselves, conscious modifications made by the learner, and modifications made by an external influence.

Research has shown that since most of the constituent elements of a learning style are based on biological factors, it is more likely to change during the initial years of a student, i.e.

the elementary stage. This is because these years cover the critical growth period of a child, and their learning style will also vary with biological alterations (Creative Learning Systems, 2010). However, after the teenage years, when biological factors are less chaotic, learning style becomes stable enough to forsee any significant changes over the course of one's life.. This is also supported by Cohen (1984) who stated that second language learners can consciously make use of such interventions, which have been known to accelerate or modify the learning process

Church (2004) proposed that learning styles can vary with age because learning styles are developmental, with many people's styles continuing to be change as they grow older. This is true, because the auditory and visual perception characteristics of a learner build up as an individual ages. According to Church, the factors accountable for learning style modifiability include sociological factors, motivation, responsibility, and the internal versus external structure of the learner's environment. Kolb (1981) indicated that "learning styles represent preferences for one mode of adaptation over the others; but these preferences do not operate to the exclusion of other adaptive modes and will vary from time to time and situation to situation" (p, 290).

Macduff (2005) argued that although it is evident that learning modifiability is related to an individual's developmental changes, it is not clear exactly how. Robotham (1999) stated that "longitudinal studies of groups of students during their degree studies would help to identify how learning styles may change". Macduff (2005) reported that learning style does change over time and the result of learning modifiability is a stable plateau of learning with temporary modifications "in what seems important to learn; he also suggested that learning is also influenced by the learner's past good or bad experiences. Doolan and Honigsfeld (2000) detailed the key biological and developmental elements of a learning style that are responsible for its modifiability. They indicated that more than three fifths of learning style is biological,

less than one fifth is developmental, and that natural maturation contributes significantly to modification of learning style.

Barbe and Milone (1981) conducted their research on learning style modifiability with elementary school children who were both native English speaking and second language learners. They found that learning styles changed with the developmental phases of a child. They noted that students learning styles were changeable between kindergarten and grade six when visual learning styles become the dominant style and the kinaesthetic overtakes the auditory. In addition they reported that another change for individual learning styles occurs between late elementary school and adulthood. However, Copenhaver (1979) conducted a involving study secondary and post-secondary students and found that learning styles remained consistent. This finding implies that learning style modifiability is more likely to occur in the initial developmental phases of an individual, slows down and finally diminishes beyond the teenage years. Dorsey and Pierson (1984) examined the type of learning style modifications that typically occur as an individual grows older. They conducted their research on adults of approximately 30 years of age. They found that age definitely has an influence on learning style modifiability, as does past work experience. The data they collected reveals that as a person grows beyond the age of 33, they are more likely to learn by a kinaesthetic mode of learning, something which might not have been their learning style when they were younger.

Reid (1987) suggested that the students, whether they are native English speakers or only speak it as a second language, should be made aware of the concept of learning style and its modifiability, especially if it is accepted that learning style preferences are likely to change over time and that unconscious learning styles can be made conscious ones with little effort. This will result in better results shown by the students. They should be given the choice to choose their own learning style preferences so that they are able to diversify their experiences

and make modifications to their learning styles. Hayes and Allinson (1996) suggested changing the learning styles to become more interactive with different learning environments in order to enhance learning outcomes.

Very few studies have examined the stability and change of learning style. Guillory (1990) conducted a study to investigate the stability of learning styles in developmental reading. A sample of 100 freshman undergraduate students participated in the study. At the beginning of the course, the Academic Skills Centre administrated the Nelson - Denny test to assess students' reading skills. Students were categorized into two reading classes (low and advanced) according to their reading score. The researcher also used Canfield learning style inventory to determine students learning styles. The Canfield inventory assesses four major scales - conditions, content, mode and expectations. The inventory consists of 30 items, and each item requires the students to rank four options in the order in which they describe learning styles. Both classes studied the same reading course and no special considerations were given to students. At the end of the course, the Nelson- Denny reading test and Canfield learning style were also administered. The result indicated that learning styles were generally stable, despite some instability found in self- reported aspects of learning styles.

Several researchers have examined the stability of learning styles while assessing the validity of learning styles instruments. For example, Sims, Veres, Watson and Buckner (1986) administered the original and a revised copy of the Kolb inventory three times during an academic semester, with a five week time gap between each administration of the inventory. Graduate and undergraduate business students responded to study measurement and the number of the sample was varied from time to time for both copies of the inventory. The result represents a distinct change in learning styles from one administration of the inventory to another for both copies of the Kolb inventory. Furthermore, Veres, Sims and Locklear (1991) conducted a study with a large sample of 763 participants with mean age of 28 years in

the initial study, and 1115 participants with mean age of 26 years in the replication of the study. They used a Kolb inventory and they administered the inventory three times at eight week intervals to all participants. The study reported that few subjects changed learning style classification from one administration of the inventory to another. Ruble and Stout (1991) completed a study with graduate and undergraduate business students. Although the total sample was 644 students, 231 students responded to the standard Kolb inventory (1985) whereas the second group of 413 students responded to a scrambled version of Kolb in which the items were scrambled within each block of four items but the order of the 12 blocks contained within the Kolb (1985) was not changed. The instruments were administered twice with a five week time gap. The results were that 56% of the respondents to the standard version were placed in the same category for both tests and 53% of students who responded to the scrambled version were placed in the same category in both tests.

A study by Loo (1997) used the Kolb inventory to examine the stability of the learning styles of 152 undergraduate students. The researcher administered the inventory at the beginning of the semester, as well as at the end of semester after 10 week interval. The results indicated that half of the total number of participants' demonstrated the same learning style on both testing occasions. The small percentage change was observed on assimilator, accommodator and converger styles. Also, the result showed that only 13 % of participants changed their learning styles to an opposite style and that female students were less likely to change to opposite styles than males.

Garner (2000) stated that "change in learning styles is not being denied but rather the difficulty of such change is being acknowledged. The stability developed by the styles is such that it exhibits many of the qualities of traits, but they should, despite the stability, be perceived as states" (p, 345). Guillory (1990) proposed that individual learning styles were

changeable in one of four broad categories: (a) the nature of the learning styles (b) content interaction (c) ethnic or cultural interaction and (d) teacher and student interaction.

Hence, we conclude that an individual's learning style is typically modified over the child and adolescent growth periods. Every person has a unique learning style which is likely to change when they go through developmental phases in the early years of childhood. Since learning styles are made up of biological and developmental constituents, there is the strong possibility of alterations occurring prior to a more stable representation of learning style being present in adulthood. Learners should be encouraged to understand the concept of learning style modifiability so that they can make best use of the learning styles with which they are most comfortable with. The next section in this literature discusses reading.

Reading

Reading is fundamental to learning. According to Brown (2008), reading is a required skill for an individual to achieve their goals in education and the workplace. Armbruster, Lehr and Osbrn (2003) described reading as a complicated process, and achievement in reading has been linked to learning styles. Previous studies (e.g. Carbo 1987, Carbo 1988) have identified that matching students learning styles to reading teaching methods results in improved reading achievement.

The first part of this chapter examined literature pertaining to learning styles and approaches that theorists have used to define, describe, and measure aspects of learning style. In this chapter I will now explore reading in a similar way. First, there is an examination of the approaches which are used to teach reading, followed by reading material which is utilised when teaching reading in schools, and an explanation of reading skills and their measurement. This is followed by an examination of students' reading habits, characteristics of good and poor readers, and reading assessment. The evidence supporting factors affecting the reading achievement will be discussion and conclusion drawn.

Reading Approaches

Reading approach refers to the method used by teachers to teach reading to students. The reading approach influences the reading program used in the school. Most reading programs are based on a specific underlying theory or approach to teaching reading. Phonics and Whole Language are the major approaches to teaching reading.

Phonics approach.

Teaching students to make a connection between the letter and sound of the letter is the phonics or phonemes approach. Carver (2000) stated that the phonics approach is "a code-emphasis approach that typically involves learning abstract rules about the spelling of words and their pronunciation" (p, 373). According to McGuinness (2004) phonics is actually a method utilized in the language in order to allow teachers and instructors to encourage the individual to read and write in the same language. It focuses on allowing the students to connect the sound with groups of letters or individual letters. For instance, the sound 'C' can be represented by 'K' and vice versa. Both letters can also be represented by different spellings such as 'ch'. This method basically allows students to blend the sounds of the letters being learned in the order to best aid them in their pronunciations, especially when there are new words being taught. McGuinness, noted that students are taught how to read using phonics at a very young age, and while teachers have the responsibility to provide students with basic information about using phonics, students are expected to learn how to connect letters and the sounds that represent them. Throughout history, the use of phonics in teaching reading has been highly controversial, since language in itself is extremely complex. Reyhner (2008) indicated the phonic is a 'bottom up' approach used to teach students how to decode the meaning of text. According to Andrejevic (2001), Phonics was the major method of teaching reading from 1955 - 1980,. Trachtenburg (1990) claimed that teaching phonics to beginning readers maximises their opportunity to achieve.

There are various approaches in teaching phonics to students. Adams (1990) and Tassoni, Beith, Bulman and Eldridge (2007) identified 'synthetic phonics' and 'analytical phonics' as the two main approaches. Adams (1990) and Lewis and Ellis (2006) explained the synthetic phonics approach, which refers to the method usually used during the early stages when a child has just started to learn how to read. It involves the child having to first examine the spelling of a word, learn the letters that make up the word, learn the sound of each letter and blend the sounds together. It works best if the child is made to practice this method again and again with other words so that the same method can be used to read new words being introduced. The analytical phonics approach, according to Adams (1990) and Hall (2007) referred to students being taught to group certain sounds together. Thus in a single word, such as 'cat,' the students will first be taught how to pronounce 'kuh'as a single unit, then 'tuh,', gradually moving through all the consonants and vowels that make up a given word.

Another type of approach to teaching phonics is analogy phonics. According to Pressley, Gaskins and Fingeret (2006) and Ehri (2009), analogy phonics is a sub-category of analytical phonics, and refers to use of phonograms in a word. Teachers instruct their students to first analyse a word according to its phonic elements. Embedded phonics is the type of phonic approach, according to Linan-Thompson and Vaughn (2007) stated that "teachers who use embedded phonics teach letter-sound relationships during the reading of connected text. Embedded phonics is less explicit than synthetic phonics instruction" (p. 32).

Agnew (2005) stated that asking students to link sounds (phonemes) is the most common method used in schools to assess their phonic skills. Furthermore, the development of phonic skill depends on the development of phonemic awareness. Hempenstall (2003) stated that in the phonemic approach, the learner is concerned with the structure rather than the meaning of a word, and the learner should be able to link spelling to sound.

The National Reading Panel (NRP) (2000) identified phonemes as the sound that can be heard when reading out the letters of the alphabet. It has been considered that being aware of phonics (phonological awareness) is critical to developing reading skills. Instructional strategies in schools have taught phonemic awareness through the segmentation of different words into the smallest sound possible. Whitaker, Harvey, Hassell, Linder and Tutterrow (2006) noted that some students seem to have difficulty when it comes to segmenting a word according to its sound. When this happens, the instructions from the teachers tend to focus on dividing the word into larger components from the onset of instruction, which refers to initial consonants and rhyme, referring to the vowels and letters after the consonants that make up the remainder of the syllable. After this, the instructions move towards the segmentation of individual sounds. The results of a study conducted by Juel, Griffith and Gough (1986) strongly suggested that "without phonemic awareness, exposure to print does little to foster spelling- sound knowledge" (p. 243). Armbruster et al. (2003) indicated that teachers and instructors must be able to effectively determine the student's stage of phonemic awareness in order to find out how to best teach the learner. They also emphasised the importance of the fact that phonemic awareness allows students to notice, emphasize, and manipulate sounds when speaking.

Many studies were conducted to examine the effect of phonics approaches on students' reading achievement (e.g., Barrett, 1995; Troia, 1999; Turan & Gul, 2008). A longitudinal study was conducted by Shareet al. (1984) to investigate sources of individual differences in reading achievement. A sample of 487 students from Kindergarten and grade one participated in the study. The researchers used many measures to cover pre-reading abilities: oral language abilities, motor skills, personality, home background (concerned with literacy at home), the quantity and quality of television viewing, the educational aspirations of the parents for their child, family size, and birth order. The phonemic segmentation test was

used on a group of students. This test consisted of two parts - the first part contained nine items which required the students to say the initial phoneme and then the remainder of the word with initial phoneme elided. The second part of the test asked students to segment the word into initial, medial, and final phonemes. The results showed that the phonemic awareness was the top predictor of reading achievement along with letter knowledge. Also, phonemic awareness was correlated with reading achievement in kindergarten r = .66 and with reading achievement on students in grade one r = .62. Similarly, Kilcrease (1989) evaluated the effect of the synthetic phonics reading program on reading achievement in second grade elementary school students. The study employed an experimental research design with 30 students who were randomly selected. The reading achievement of the sample ranged between average and low average according to the Stanford Achievement Tests (SAT). Students were divided equally into experimental and control groups. The Metropolitan Achievement Test, Primary I-form L (MAT) was used to determine reading achievement in the pre-test. Students in the experimental group received phonics reading instruction from Reading With Phonics by Hay, Hletko and Wingo. The Reading With Phonics program was presented by the researcher over two 60 minute sessions a week for a total of 18 hours. Students in the experimental group also received their regular reading instruction from the classroom teachers. The control group received a program of oral and sustained silent reading from the researcher in two 60 minute sessions each week and basal reading instruction from their teachers. The researcher used the Metropolitan Achievement Test (MAT) to assess the reading achievement as the post-test. The result of t-tests showed significant differences in the pre and post-test reading achievement scores of the experimental group in total reading, vocabulary and word recognition. The result also showed significant differences in the pre and post-test reading achievement scores of the control group in total reading and word recognition, while comparing between the mean post-test scores of the experimental and

control groups on total reading scores, vocabulary, word recognition and comprehension as measured by (MAT) showed no significant differences.

Dahl et al. (2000) conducted a study to investigate how phonics were being taught in whole language classrooms. They examined phonics teaching and students' reading achievement. A sample of 178 students at a grade one level from eight different schools participated in the study. Four instruments were used to measure reading achievement - two decoding (Text Reading Level 'TRL' and Qualitative reading Inventory –II 'QRI-II'), and two encoding, (Hearing and Recording Sounds in Words 'HRSW' and Developmental Spelling Analysis 'DSA'). The dictation task test 'TRL' was conducted at the beginning of the year to determine students' abilities to hear and record sounds in words and reading achievement. According to pre-test dictation task, students were categorized into three groups, 123 students were classified as grade one readers, 42 students as 'pre-primer' readers and 13 students below pre-primer readers. The dictation task test 'TRL' was conducted as post-test at the end of the year and the result showed a clear increase in reading achievement after teaching phonic approaches through whole language classrooms. The reading levels of students who were in grade one jumped to a grade five level. The scores of pre-primer readers rose to grade one, while those below pre-primer also rose to a grade one level. The study found that phonics were both taught and learned in whole language classrooms, giving credibility to the fact that phonics can be taught and learned within the context of meaningful reading and writing instruction.

Another experimental study aiming to investigate the relationship between phonics and reading achievement was conducted by Nunez-Leib (2001). This study was based on Saxon programs. Saxon's primary phonics series is a program which teaches students how to read by introducing them to language in small increments. The study sample consisted of 402 grade three students, who had completed the reading curriculum at kindergarten through to

second grade. The sample was divided into two groups; the treatment group, comprised of 201students who engaged in the Saxon phonics program in addition to the basal during the 1995 through 1998 school years. The control group consisted of students who did not receive the Saxon phonics program during the 1991 through 1994 school years. Student reading achievement was measured by Iowa Tests of Basic Skills scores during the 1994, 1995, 1998 and 1999 school years. The T-test result showed significant differences in reading achievement between students who received Saxon Phonics and students who did not. Students who received the Saxon program were better off than those who recieved standard teaching methods, and the t-test was significant on all three subscales of Iowa reading tests.

A comparison of the reading achievement of students who were taught by using phonics approaches and those who were taught by balance methods (teaching reading involves the use of phonics and whole language practices) was the purpose of a study conducted by Agnew (2005). The study used the Stanford Achievement Test Series to determine the reading achievement levels of grade four students at Christian schools. This measure classified students in four levels according to their achievement: level 1 for students who had low or limited of knowledge and skills, level 2 for students who had partial knowledge and skills that are fundamental for satisfactory work, level 3 for students prepared for the next grade, and level four for students who showed superior performance beyond grade level. 371 students participated in the study, the sample divided into 146 students in the experimental group and 225 students in control group. The control group was taught using a strictly scripted phonics program, with over 70 % of the time spent on phonics skills, drills, practice, grammar and penmanship. The experimental group was taught using the balance program, with less than 50 % of class time spent on phonics skills, drills, practice, grammar and penmanship. More time was spent on literacy development, and students had chance to choose the books they preferred. Most of the language arts program was not scripted in the

balance group. The Stanford Achievement Test was administered twice, in Spring 2002 and Spring 2003, as the pre and post-test. Students in both groups were distributed through four levels according to Stanford achievements. The ANOVA result showed no significant differences between control and treatment groups on reading achievement. Low students in both groups (phonics approach and balanced approach), however, showed a significant increase in scaled score on reading comprehension by the end of fourth grade when compared with the other three reading performance levels.

Thompson, Connelly, Fletcher-Flinn and Hodson (2009) conducted a study to test whether reading instruction completed during the early school years had any continuing effect on the ways in which adults read. Undergraduate students from two universities participated and were allotted to one of two study groups. Students in the first group had received explicit phonics instruction in childhood, whereas the second group had no specific phonics based instruction. The ANOVA result showed significant differences between the two groups. Students who had childhood phonics instruction used more regular grapheme-phoneme correspondence that was context free, and used less vocabulary – based contextually dependent correspondences than adults who had no phonics instruction.

Whole language approaches.

This approach to teaching reading is also called the 'top down' theory of reading, which underlines the value of teaching language as a single entity. This approach to teaching reading involves acquiring as much information about the meaning of a given word as is possible, in order to achieve a deeper understanding of language. Goodman (2005) stated that "whole language is the most powerful grassroots pedagogical movement ever to have developed in education" (p, 3). Lapp, Brock, Fisher and Flood (2007) considered that a whole language approach is the best method to represent philosophies of reading.

There are a number of terms used to express the philosophy of whole language. According to Goodman (1989) the term ‘whole language’ came from the teachers who were becoming aware of advances in knowledge surrounding oral and written language development and the reading and writing processes. Clay (1990) enumerated some of the terms which were used in lieu of ‘whole language’ such as a teaching movement, a philosophy, a method, a way of teaching, and a belief system. In addition, Ellis (2005) proposed that the terms meaning-centred, integration, and the term ‘natural learning’ are associated with whole language approaches.

No clear definition has been made for the whole language approach. Batenhorst (1994) described researchers’ attempts at defining the whole language approach as an elusive endeavour. Ellis (2005) indicated that “even whole language advocates openly admit that the concept is difficult to define” (p, 186). In describing the whole language approach, Pahl and Monson (1992) noted that it has theoretical roots which are hidden below the surface of instruction. Furthermore, Goodman (2007) stated that “I define whole language, as I have always viewed it, as a social and political teachers’ movement” (p. 17). Eagles (1995) described it as the term used to identify a different philosophy, based on the beliefs and theories about how the student learns language.

Watson (1989) identified three factors which make whole language difficult to define. Firstly, there is no dictionary type definition that can be looked up and memorized. The definitions reflect personal and professional growth of the advocators. Secondly, most whole language advocates are argumentative about it. Another reason why it is difficult to reach a specific definition could be that the teachers of whole language have not been consulted, although this is beginning to change

Similar ideas were identified by Altwerger, Edelsk and Flores (1987) as the basis for the whole language approach;

> "(a) language is for making meaning, for accomplishing purposes; (b) written language is language thus what is true for language in general is true for written language; (c) the cuing systems of language (phonology in oral, orthography in written language, morphology , syntax, semantics, pragmatics) are always simultaneously present and interacting in any instance of language in use; (d) language use always occurs in situation; (e) situations are critical to meaning making" (p, 145)

The learner's use of the whole language approach was described by Sweet (1996), who stated that students use a 'look and say' methodology which requires them to memorize the whole word, only in whole language the learner is taught the word using the authentic literature. Edelsky, Draper and Smith (1983) described the whole language classroom as different to a conventional classroom as there is no spelling book, sets of reading or writing assignments, and the children's writing and authorship are included with the reading program of children's literature.

A three year experimental study was conducted by Clay (1990) to evaluate the impact of whole language on students' reading achievement. A sample of 129 first grade students participated in the study. Students were recruited from seven classes. Three classes were grouped to comprise a control group of 53 students, and four classes were grouped to comprise an experimental group of 73 students. Seven teachers also participated to teach two different instructional philosophical approaches and report to the researcher at the end of the third year. Four teachers taught the experimental group using the whole language approach, and three teachers worked with the control group using the traditional basal-centred program. Four instruments were used to evaluate reading achievement during the study: (a) the Gates-Macginitie reading test-level A (1987) which consists of a vocabulary subtest, comprehension subtest and the total score, (b) Texas Educational Assessment of Minimum Skills (TEAMS), which measures areas of reading, writing and mathematics, wherein scores are reported as

passing or non-passing for each of the areas tested, (c) the Conroe Language Arts Curriculum (CLAC) test, related to the district's language arts curriculum and (d) the California Achievement Test (CAT), which is norm referenced and yields a comprehensive set of measures. The districts provided the researcher with the TEAMS and CLAC test scores, and the researcher also administrated the Gates-MacGinitie reading test to the first grade. A Chi-Square statistical technique was used to examine the differences between the two groups. At the end of the first grade only scores for 54 students from the experimental group and 40 students from the control group were determined. On the Gates-MacGinitie test the result showed significant differences between two groups on the vocabulary subtest, with students in the experimental group being more proficient in this subtest than their peers in the control group. Further significant differences were found between two groups on the CLCA, while no statistical differences were identified between the groups on TEAMS. In the end of the second grade, only 40 students from the experimental group and 33 students from the control group responded to the CAT test and the result showed significant differences between the students on the vocabulary section. By the end of grade three, 36 students from the original first grade experimental group were tested with the third grade CLAC and TEAMS, while 29 students from the original first grade control group took the CLAC test at the end of the third grade and 30 students from the control group took the third grade TEAMS test. The chi-square result showed no statistical differences between the two groups on both tests. The research reports that the teacher and student interviews revealed that student attitudes toward reading were improved and that the whole language philosophy was more rewarding personally and professionally for the teacher.

A longitudinal study was conducted by Engelhardt (2000) to compare the effects of whole language approaches and traditional instruction using basal reader approach on reading achievement. In the first year of the study, 95 students were selected randomly form the first

grade student population - 19 students of the 95 were randomly allocated to an experimental group and taught reading using the basal reader approach. The control group consisted of 76 students, who were taught using the whole language approach. The whole language group were taught by four teachers in the first grade and four different teachers in second grade, while the experimental group were taught by two teachers for each grade. The researcher used the Missouri Mastery and Achievement Tests (MMAT) to assess students reading achievement at the end of second grade. The reading subtest in MMAT for grade two consists of story elements, real/make-believe, cause-effect, main idea, outcome prediction and directions. Four questions test each skill. A T-test result showed no differences between the control and experimental groups on reading achievement. This is consistent with the previous research by Clay (1990) who reported no difference in reading achievement using whole language.

A study conducted by Azwell (1989) investigated the effect of a whole language approach on reading achievement in students from grades three to five who differ in scholastic ability and cognitive style. Two elementary schools (A and B) were selected to participate in this study. A sample of 102 students was selected, comprising 49 students from school A and 53 students from school B. School A students were instructed in reading using a whole language approach, and students at school B were instructed reading using the district wide adopted basal reader. The researcher used the regular district- administered Sra Educational Ability Series SRA and SRA Survey of Basic Skills (1985) to determine reading achievement and scholastic ability. The students' cognitive styles were identified by Group Embedded Figures Test (GEFT). According to scholastic ability level, students in both groups were categorized into three categories; high, average and below. Students reading achievement levels were measured as pre and post-test. Two way ANCOVA interactions between reading teaching method and scholastic ability level showed significant difference,

with high and average ability students at school A demonstrating a clear increase in their reading achievement.

Brace (2001) compared the effect of the whole language and phonemic awareness teaching methods on students' reading achievement. A sample was selected from grade three, and 30 students were divided equally into two classrooms. All students had completed third grade and students had volunteered for summer school for reading improvement. One class used the whole language approach while another used phonemic awareness instruction. The reading achievement in both groups was assessed by the Stanford 9 Achievement Test at the beginning and end of the course. The Kruskal-Wallis statistical test was used to compare the effects of instructional reading methods on student reading achievement. The result showed significant variance of growth in reading abilities within each group, and students in the whole language group had greater growth during the study. Smith (1998) conducted a study to determine the different effects of whole language and integrated phonics methods of instruction for beginning reader students. Four schools were selected randomly, and then two classes of four-year olds from each school were also selected randomly to participate in the study. The study involved 114 students, and each school had two groups of participants, with group A students as the control group and B as the experimental group. Students in group A received a whole language method of instruction, while group B received an integrated phonics method of instruction. The reading achievement was measured by the Woodcock-Johnson test of achievement, revised form A and B. The five subtests (letter-word identification, word attack, passage comprehension, vocabulary and dictation) of the reading achievement measures were administered to each participant. A t-test was used to examine the differences in reading achievement in both groups. The pre-test of reading achievement showed no significant differences between the two groups in reading achievement, while the

t-test result for post-test showed a significant difference. Students in the experimental group performed significantly higher than the control group in reading.

Reading Resources

Reading resources in the class room create a unique environment and assist students to develop their reading skills. Different materials can be used for reading activities in the class-room such as books, computers and CD-ROMs. Pang, Muaka, Bernhardt and Kamil (2003) suggested that the type of teaching method and resources are determined by the type of learner. They also commented that a lack of variety in materials leads to limited reading and language experiences. Books are considered as a fundamental resource in schools. According to Juel (2006) the main origin for vocabulary is the book, as it provides a stimulus for child's conversations that can promote knowledge and thinking. Juel also postulates that when a student has greater exposure to books; it is highly likely that they would develop reading skills at a faster rate compared to other students who are not. This is because one of the major components of reading, the improvement of one's vocabulary, is crucial to enhancing reading development. This idea is supported by McKeown and Beck (2006) who agree that the text of the material itself, the reading style and its quality, and the frequency with which books are reread are all important in developing the student's vocabulary. Justice, Meier and Walpole (2005) stated that there has been much speculation as to whether children would be able to appreciate the text written in the book, but according to research studies, there is not enough evidence to show that exposing children to books with written text is useless as children often ignore the text itself and appreciate the images more. Anderson, Hiebert and Wilkinson (1985) explains that the reason why some students disappoint when it comes to exhibiting satisfactory reading skills is because these students are not being provided with instructional materials that are challenging enough. The problem can be easily understood however, since teachers are constantly struggling to meet the needs of students who have learning disabilities

as well as students who do not suffer from learning disabilities at all. In addition, teachers also have to know how to deal with students who are able to read above their own respective grade levels (Rickford, 2001). A study conducted by Reis et al (2004) focused on the instructional strategies of teachers in the third and seventh grades at urban and suburban schools. Twelve groups of students were selected to participate to this study. The study used observational methods to collect data focused on talented readers. The talented reader was defined as a student reading at least two grades above their chronological grade placement, who also possessed advanced language skills and processing capabilities in reading. Three classes comprised cohorts of talented students, and they received some differentiated reading instruction, while nine classes were offered no challenge in reading materials. The result indicated that differences were most obvious in urban classroom and in middle school classrooms in which classroom libraries had considerably fewer books of high challenge levels. The researcher found that when teachers made use of advanced books or materials, these items were rarely or never used at all and were simply shelved. Good readers were considered the same for reading in the 12 classrooms that were observed in the study. In fact, students who were able to read above grade level received the same instructions and materials as with their peers who read at their own grade level, including those who read years below the appropriate grade level. An experimental study also conducted by Reis et al (2005) investigated the effect of an enriched reading program on elementary students' reading skills. Four schools participated in this study. In the first year of the study students from grades three to six at two urban schools with low socioeconomic status were selected at random. One school was selected as a control group to learn the reading using a traditional basal reading series, while the treatment school group learned reading using the Schoolwide Enrichment Reading Model (SEM-R). The Schoolwide Enrichment Reading Model provided enriched reading experiences by exposing students to exciting, high interest books. The SEM-R

includes listening comprehension skill, high quality literature read aloud by teachers, and higher-order questioning and thinking skills instruction. In the second year, two additional schools, one urban and one suburban, were added to treatment group in the study. The control school continued with previous instruction and the SEM-R was implemented for 14 weeks in the treatment schools. Based on the results, the study concluded that teachers should make use of the 'pedagogy of gifted education' in order to improve reading instruction for all the students involved. This reading intervention was referred to as the School Wide Enrichment Reading Model, which aimed to provide students with proper materials and instruction to boost their reading levels by being challenged. Renzulli and Reis (1997) stated that the SEM-R was actually adapted and modified using an earlier model, the Enrichment Triad-Model as its base. Both models were actually used in order to develop talent all over the United States. The SEM-R included a total of three categories of reading teaching techniques that were designed to allow the instruction and flexibility according to the need of both the teachers and the students. As previously mentioned, the SEM-R was adapted from the Enrichment Triad-Model, the latter being composed of three enrichment levels. The first level included maximum and varied exposure to areas that would interest the students. The second level focused on training method instruction, and the third level focused on providing the students with sufficient opportunities so that they would be able to pursue their own subjects of interest. Cooper (2001) emphasized the use of variety in the type of books used for instruction to meet the varying needs of students as they learn to read. The researcher suggested that wordless books can be used to develop students' oral language, self expression and develop a concept of themselves as readers, and predictable texts (described by the researcher as texts that utilize a repeated pattern of some type to introduce students to reading and to provide practice through repetition). Controlled High-Frequency Vocabulary texts are the supplementary material to provide practice in reading high-frequency words. Decodable texts

such as the aforementioned materials help students in phonics and structural skills that have already been taught. Authentic literature is also used for practice and applied reading. Created texts are stories and informational texts which are written to control the level of difficulty.

Berardo (2006) enumerated the various type of reading material which can be used in the classrooms such as newspapers, magazines, TV programs, movies, songs, literature, and the internet, which he considers the most useful type of material because it is continuously updated. Demman (2004) claimed to integrate the technology and reading curriculum, and the researcher said the software needs to be sound in instructional design. A study conducted by Agee and Altarriba (2009) examined the influence of everyday computer use on students literacy practices. The study involved two suburban schools, and 189 students from grades six and seven students were selected to participate in the study. The researchers used quantitative and qualitative methods to collect data. All students responded to the literacy inventory of 73 items to provide an overview of the ways in which these students used computer technologies. Data was also collected by individual interviews with 24 students (12 from each school). These students were categorized according to their reading scores as advanced, proficient or basic readers. Students who selected for the interview were asked to a read short story consisting of 36 idea units and were then given unlimited time to write down what they could remember about the story before the interview. The reading time and the number of idea units were recorded. The overall ANOVA showed the advanced reader can read fastest and remember a higher number of idea units followed by proficient readers and then basic readers. In terms of using email, students in the basic reader group showed less interest than the other groups. A Chi-Square analysis showed significant differences between proficient readers in grades six and seven and advance readers in grade seven, who showed more interest for reading email than advance readers in grade six. The interviews' result showed that reading from a screen was difficult and uncomfortable for students in both grades, and that books or

magazines were the preferred type of reading material for six grade students. There was agreement between all students about the problems with reading from a computer screen. Similarly Karchmer (2001) explored 13 Kindergarten to Year-12 teachers' reports that their students preferred to use library books and encyclopaedias rather than the Internet. They also noted that the Internet was not always the best medium for their students. The concept of the Internet in the class room has radically changed in the last ten years and the Internet has become one of the most important tools in the modern classroom.

Computer software has become one of the most helpful tools in helping to teach children. Lapp et al (2007) demonstrated a range of software designed to teach students key aspects of language, art, and reading. Sullivan (1989) examined the effects of an integrated-learning system (ILS) format of computer assisted instruction on reading and mathematics achievement for students in the fourth and fifth gradea. Two groups were selected - group one consisted of 44 regular students who had taken and completed the Stanford Achievement Tests in both subjects during the last three years. Group two consisted of 29 students who met the criteria for at-risk students for the last three years on the Stanford Achievement test. The three years' reading achievement scores for each student served as the achievement baseline for the computation of control data for both groups. Students in the regular group attended the ILS laboratory for 25 minutes twice a week, while at-risk group attended the ILS for 25 minutes on a daily basis. The Stanford Achievement test was also administered as the post-test for both groups. A t-test result showed significant achievement gains in reading for both groups according to the Stanford Achievement Test. That means the ILS was the most suitable resource with which to enhance the reading level of students.

Talley (1994) conducted a study to examine the effect of a computer CD-ROM storybook on literacy development. A sample of 73 four year old students participated in the study. The emergent literacy skill was assessed in the first phase of the study as the pre-test

using five measures: print awareness test, concepts about print, picnic assessment (a wordless picture book used to measure student progress when comparing three different early literacy programs), title recognition test and story retelling. The title recognition test and story retelling were later dropped from the study because the two measurements were determined to be less effective. According to the pre-test results students were divided into three groups. Twenty percent of students were scored in the top and categorized as well-read control group while 80 percent of the sample was categorized into two groups, a not-well-read control group and a not-well-read experimental. The interactive storybook on the computer program was available only for experimental group students three times per week. The researcher used the three measurements of the pre-test phase to assess the development of literacy skill as the post-test measures. An ANOVA was conducted to examine the increase of the comprehension abilities between the experimental group and control groups. The results showed significant differences between the groups on the print awareness test scores and concepts about print scores. The mean scores in the experimental group were higher than for the control group, but not as high as the well read group. A T-test also evaluated the change in student scores, and the results indicated a statistically significant difference between pre and post-test scores. The researcher concluded that the CD-ROM storybooks were useful in the preschool classroom to develop emergent literacy instruction.

Reading Skills

Reading skills are the individual ability to process and comprehend print information. Comprehension, vocabulary and fluency are considered as the most important reading skills for learners to possess in order to achieve their goals in education.

Reading comprehension.

Understanding the text is a specific target for students. According to Aarnoutes and Leeuwe (1998) reading comprehension refers to “understanding the meaning of written word,

sentences and texts" (p. 144). Harris and Hodges (1995) defined reading comprehension as the construction of the text's meaning through a reciprocal interchange of ideas between the interpreter and the message in a context. Snow (2002) indicated that reading comprehension consists of three elements: (a) the reader with his abilities, knowledge and his experiences; (b) the print or electronic text, and the activity including; (c) the purposes and consequences associated with the act of reading. Pang et al. (2003) proposed that comprehension is the active process of using the prior knowledge of the reader. Durkin (2004) described the reading as the complex cognitive process which asks the reader to process interaction between the reader and text to construct meaning. Leu and Kinzer (1999) suggested that reading comprehension requires students be able to understand the meaning in the text, and this understanding has to be based on the background knowledge of students and their ability to connect between different pieces of information in the text.

An analysis of the extant research data conducted by NRP (2000) found that:

> "three predominant themes emerged: (1) reading comprehension is a cognitive process that integrates complex skills and cannot be understood without examining the critical role of vocabulary learning and instruction and its development; (2) active interactive strategic processes are critically necessary to development of reading comprehension; (3) the preparation of teachers to best equip them to facilitate these complex processes is critical and intimately tied to the development of reading comprehension" (p, 4-1).

The NRP (2000) team analysed 203 studies on instruction of text comprehension, and identified 16 types of effective procedures. In addition the team outlined eight procedures considered to be effective to improve the comprehension of text in the classroom. These instructional methods include: comprehension monitoring, cooperative learning, graphic and semantic organizers, story structure, question answering, question generation, summarization and multiple-strategy.

Reading comprehension based on vocabulary and fluency. According to Curtis and Longo (2001) instruction vocabulary has significance in developing students' reading comprehension, whereas Pikulski and Chard (2005) considered fluency as the bridge to reading comprehension.

The NRP team (2000) found that effective classroom instructions used to improve students reading comprehension included: (a) monitoring the reader and teaching him or her to deal with problems as they arise; (b) instructing readers to work together to apply different reading methods; (c) directing the readers to represent the meaning and the relationship of the words in the text graphically; (d) asking the readers to build a story structure from which they could ask and answer different questions about the plot, characters, and events in stories; (e) answering questions posted by the teacher and questions asked by the readers themselves;(f) directing the reader to summarize the text to include the main ideas into a complete solid structure; (g) applying different and multiple teaching methods in which the reader interacts with the teacher over the text.

McKeowm, Beck, Omanson and Perfetti (1983) investigated the relationship between vocabulary instruction and reading comprehension. Grade four students from two different schools were chosen to be sampled, one class from each school in the control group and three classes in the experimental group. The Iowa Test of Basic Skill was administered as the pre-test. The experimental group went though 104 difficult words in approximately 75 lessons, each 30 minutes in length, over a five month period. The control group received traditional language arts instruction. At the end of the five months, the groups were given the post-test. The study reported the vocabulary instruction had a strong relationship to text comprehension. In addition, Wixson (1986) conducted study of 120 fifth grade students from two different schools, who were average and above average in reading skills. He used the Iowa Test of Basic Skill to determine the students' reading level. The researcher selected two stories (Cave,

King) for the fourth and fifth grades to use in the study. In addition, two teaching methods (dictionary and concept) were used to teach the stories for students. Students were divided equally into eight groups according to word level (central or non-central) and method of instruction (dictionary or concept). These groups were: central concept King, non-central concept King, central dictionary King, non-central dictionary King, central concept Cave, non-central concept Cave, central dictionary Cave, and non-central dictionary Cave. All groups attended to a 30 minute vocabulary lesson before being given 15 minutes to read the story silently. The post-test was utilized after 24 hours, when they were asked to freely recall the story they had read, followed by definition and example questions and ending with a comprehension question. The ANCOVA result showed a significant effect on achievement in recall and comprehension. The study also suggested that "the comprehension questions designed to evaluate students' understanding of story ideas that were related to the instructed vocabulary provided a more sensitive measure of children's comprehension than general recall measure" (Wixson, 1986, p317).

Fluency is regarded as the best indicator for overall reading competence, which includes comprehension (Fuchs, Fuchs, Hosp & Jenkins 2001). The relationship between fluency and reading comprehension was examined by Jenkins, Fuchs, Broek, Espin and Deno (2003). The sample of 113 fourth grade students was selected randomly from six schools. The researchers measured context and context-free reading performance. The performance was measured by asking students to read aloud for one minute and counting the number of words read correctly and incorrectly. The Iowa Test of Basic Skills was used to assess reading comprehension. The result showed strong correlation between fluency and reading comprehension. Exploring this relationship was the aim of a subsequent study conducted by Wise et al (2010), who examined it with a different measurement. The researchers used three measurements to assess the fluency: nonsense-word oral reading fluency, real-word oral

reading fluency, and oral reading fluency of connected text. Reading comprehension was assessed by the comprehensive test of reading related phonological processes. Two groups from grade two were selected to participate to the study:(a) 146 students who evidenced difficulties with nonsense-word oral reading fluency, real-word oral reading fluency, and oral reading fluency of connected text (ORFD), and (b) 949 students who evidenced difficulties only with oral. The correlations between reading comprehension and fluency measurements (nonsense-word oral reading fluency, real-word oral reading fluency, and oral reading fluency of connected text) in ORFD sample were .32, .20 and .23 respectively, while in CTD sample they were .70, .53, and .64 respectively.

Reading comprehension is the aim of teaching reading in schools. To develop students' comprehension skill, teachers should develop vocabulary and fluency which consider as the basis for this skill.

Reading vocabulary.

School is not the only place where an individual can learn vocabulary. According to Weizman and Snow (2001) vocabulary is being learnt through daily interaction in the home and the environment outside the home. Beck and McKeown (1991) defined vocabulary as being concerned with the knowledge of meaning, which involves the lexical concepts connected with these meanings. Lehr, Osborn and Hiebert (2004) noted that vocabulary is more complex than this broad definition suggests, and defined vocabulary as "knowledge of words and word meaning in both oral and print language and in productive and receptive forms" (p. 5). Armbruster et al (2003) differentiated between oral vocabularies and reading vocabulary, oral vocabulary represents the words used in speaking or recognized in listening while reading vocabulary refers to the words which are used in print.

Children have a varying range of vocabulary when they come to school, which is a result of the combination of many factors, For example, Snow (1993) noted that mothers in

particular, are responsible for initially influencing the vocabulary of their children. Thus, important factors to consider include the mothers' educational level, her educational expectation and the entire development of the home with regards to literacy levels. In addition Taylor (1995) discovered that other factors such as television viewing frequency, reading frequency and personal interaction all contribute towards the literacy level of child.

A NRP (2000) study found a strong relationship between learner reading ability and their vocabulary. Weizman et al (2001) also found a relationship between a child's development as it relates to vocabulary and their reading development. In fact, children who do not have extensive vocabularies are less likely to understand what they are reading and will experience more difficulty in reading throughout school. This is supported by Beals and Tabors (1993) who have shown through their research study that children who heard and utilized rare words were able to gain higher scores in academic tests and other areas to support academic achievement. This would only be possible if the reader were able to recognize the words being read in the text. If the reader does not recognize a large volume of words in the text, then this would inevitably affect the reader's comprehension level.

Vocabulary is an important area of knowledge that contributes to academic achievement. Iman (2009) indicated that increased teaching that supports vocabulary development increases academic knowledge and helps students to understand what they read. Bromley (2007) encourages teachers to use the K-W-L strategy(know, want to know, and learned) when they teach a new word, this strategy identifies what students know about the word and what they want to know about it after they are taught the word. This should involve teaching root words and prefixes to help students understanding the meaning of new words. Juel and Deffes (2004) determined that discussing the word helps students to understand the meaning, and furthermore, asking students to point to the word helps students to learn spelling. Flynt and Cooter (2005) recommended that graphic organizers such as discussion

webs should be used three times per week, because they prove to be useful in connecting ideas and introducing new vocabulary. Charlesworth and Paul (2004) suggested using poetry to teach students new vocabulary which can extend their vocabulary. Armbruster et al (2003) reported that most vocabulary is learned indirectly and some vocabulary learned directly. Students learn vocabulary indirectly through engaging in conversations, listening to adults when they read for them and reading extensively on their own, whereas difficult vocabulary is learned via being taught directly to students.

Previous research studies have focused on how to measure the vocabulary acquisition of an individual and their vocabulary knowledge. This is because simply knowing a word consists of more than just knowing the form or the meaning of the word. Richard (1976) realized this and had made a number of statements on the subject. According to Richard, word knowledge involves a number of facts: knowing the meaning of the word, semantics, and sentence usage of the word. Vocabulary techniques are discussed according to the way that they attempt to build up these aspects of vocabulary knowledge. However, other researchers have criticized Richard's (1976) framework because it lacks the consideration of orthography, collocation and phonology. Nation (2001) attempted to expand Richard's framework, and in so doing, successfully conceptualized that word knowledge also involves both productive and receptive use.

Reading fluency.

Reading through the text with accuracy in a short time is called fluency. The NRP (2000) consider fluency as one of the five critical components in being good reader and they describe the fluent reader as the reader who reads rapidly with precision and proper expression. According to Binder (1996) fluency is "the combination of accuracy plus speed that characterizes competent performance" (p. 164). Worthy and Broaddus (2002) believed fluency is not only demonstrated via rate, accuracy and automaticity, but also via phrasing,

smoothness and expressiveness, and as such they liken fluency to music. Ming and Dukes (2008) noted that, there are no shortages of definitions for fluency and presented this provided the inclusive definition: “fluent readers must be able to quickly (automatically) and accurately recognize words, read the words with adequate expression and phrasing (prosody), and draw the intended meaning from the text (comprehension)” (p. 4).

Samuels (2002) traced the importance of fluency because it has an important influence on comprehension, in the sense that the reader should have the ability to identify words quickly and easily to possess good comprehension. In addition Armbruster et al (2003) determined the importance of fluency because it links between word recognition and comprehension. Guyne (2009) noted that fluency should be built into the daily reading instruction to improve the fluency of students who have had reading difficulties. Carbo (2005) illustrated that one of the most neglected skills of the five critical reading areas is instruction in fluency. The optimum fluency instruction includes: setting up fluid models for reading, making non-fluid readers read fluently before reading loudly to others by listening then practicing the modelled passage repeatedly, utilizing different reading models such as shared reading, echo reading, recorded books, neurological impress, choral reading and pair reading. The choice of the model depends on the student reading level. Preparing high-level reading material on both tape and text allows the child to make a comparison between printed and spoken words. DeFord (1991) indicated that students should be encouraged to read their favourite stories frequently to become fluent readers. Blum and Koskinen (1991) considered the repeated reading strategy as a powerful and flexible strategy which is suitable for use in the classroom to enhance fluency. Kuhn and Stahle (2000) analysed fifteen experimental studies which assessed the effects of repeated reading on fluency. They found only six studies out of fifteen indicated significant effects for repeated reading on treatment groups. Kuhn and Stahle also noted the fluency instruction has the best effect with children between pre-primer

level and late second grade level. The NRP (2000) claimed that repeated oral reading practice leads to improvements in a given student's fluency. Manning (2004) suggested that teachers should teach their students some important concepts about fluency: students should be the most fluent readers in the classroom, they should demonstrate fluency when reading aloud, they should practice thoughtful reading and take their time, they should realise that reading at different speeds within a text depends on the reason for doing so. the familiarity of the vocabulary and the difficulty of the text, that the fluent reader may correct words and phrases as a self-monitor, that the fluent reader requires repetition of words and phrases to hold meaning, that some fluent silent readers are not necessarily fluent in oral reading and that development of fluency is supported thought good, silent reading.

Reading Class Activities

Classroom reading activities such as oral reading, reading aloud, silent reading, listening, writing, and discussion are considered as helpful activities in developing reading achievement. Reading aloud should be considered the most important activity in reading class (Anderson et al, 1985). It is the most fundamental practice for literacy development over the century (Snow et al, 1998). A study was conducted by Monda (1989) which used sixty disabled students from grades four through six to explore the effect of repetitive oral, silent and listening activities on reading. The study used 498 words of text, divided into two passages. The first passage was an experimental passage (P1) of 242 words designed to determine the effects of repeated readings, while the second passage (P1) of 256 words was intended examine the transfer of these effects to a subsequent portion of text. The sample was divided into three groups: group one was asked to read P1 aloud twice, group two was asked to read P1 silently, twice, and group three was asked to listen to same passage twice, after which all three groups were asked to read the passage aloud. Following this, they were asked to complete the comprehension questions. For P2, students were asked to read the passage

once orally before responding to a set of questions. A NOVAs result following significant analysis of oral repeated readings of passage one revealed a significant increase in reading rate from the first to the third reading. The study suggested that oral activity could have an effect on reading achievement. The effect of teachers reading aloud on vocabulary and comprehension was examined by Brabham and Lynch-Brown (2002). A sample of 246 students in grade one and three along with 15 teachers participated in the study. Three reading aloud styles were used, including: interactional, in which teachers simultaneously read and discussed stories with students, and performance, in which teachers utilized discussion before and after reading. The last style involved teachers to only read the text out aloud, which students being asked to listen to the story without asking any questions or making comments. Teachers used two informational storybooks in this study. Vocabulary pre-tests were conducted during the school day before they read the first book. Re-reading was then performed over the next three days, and a post-test for vocabulary and comprehension was conducted after the third reading. The same procedures were used in the following week. The MANOVA result was significant for vocabulary on the two books while the result was significant for the comprehension in only one of the books.

Two studies were conducted by Elley (1989) to examine vocabulary acquisition from listening to stories. Seven classrooms from seven schools were involved, with a total of 157 seven year old students along with seven teachers participating in the first study. A new storybook was selected and read three times over seven days. The teachers were not the children's regular classroom teachers, but did teach at the same schools. The pre-test consisted of 20 words thought to be unknown by the target population and was conducted 7 days before the first reading. The story was read three times over one week. The second reading was done by the regular class teachers, whilst first and third readings were by the other participating teachers. An initial discussion of title, cover picture and main characters

was utilized before the first reading. During the reading, the pictures were shown, but no definition or explanation was given for the words. The post-test consisted of the same 20 words on the pre-test and was conducted 2 days after the third reading. The result showed an overall mean increase for 15.4% across the schools, with mean gain of between 13% and 21% in each class.

The second study was performed to confirm the findings of the first, and to also examine the effect of teachers' explanation of new and unknown words. Eight classes from eight schools were selected to participate in this study. The sample was divided into three groups: Group A, consisting of 72 students in three classes, Group B, consisting of 55 students in three classes, and the control group C, consisting of 51 students in two classes. Teachers selected two storybooks under supervision of the researcher, the first, *Rapscallion Jones*; the second, *The White Crane*. In group A, teachers read *Rapscallion Jones* aloud with explanation for the unknown words in first week. In group B, teachers read *Rapscallion Jones* without explanation following the same procedure in first study. The second story was read to group A without explanation, while the story was read with explanation to group B. Each story was read three times over a period of 7 days for both groups. A pre-test was administered one week before the first reading for each group. The test consisted of 41 multiple choice vocabulary questions to test knowledge of unknown words from both stories. The post-test was utilized twice, one week after the respective books were read and again three months later. The control group took all tests at same time. The result for group A showed an overall gain of 39.9% when they heard the story with explanation and 4.4% without explanation. The increase for group B was 17.1% with explanation while the increase was 14.8% without explanation. Less than 2% improvement was recorded for the control group. Sharif, Ozuah, Dinkevic and Mulvihill (2003) also indicated to the same effect of reading aloud on reading comprehension.

Writing is another activity that can be used in reading class to increase reading achievement. Determining the effect of writing on reading achievement was the purpose for a study conducted by Christopher (1991). He investigated the effect of process writing supported by the Writing to Read program (WTR) on reading achievement through kindergarten and special education primary-level students. The study consisted of five groups. Group one and two were the control groups, consisting of students from the kindergarten: Group 1 was not exposed to process writing, while group 2 received training in process writing without the use of computers. The remaining groups were subject to experimental conditions: group 3 consisted of special education students, who attended the WTR centre for a minimum of 40 minutes on a daily basis. Group 4 were kindergarten students consisting of 12 classes at three schools. These classes continued their committee structure with activities designed to support math, art, music and science. Whole language activities were the basis for the committees. Their time in WTR was considered to be language arts class time. Some classes attended WTR for 40 minutes a day for four days, and some 50 minutes a day for three days. All students in this group were from a low socioeconomic background. Group 5 included three kindergarten classes. Two classes were attended the WTR centre for five days and the third class was schedule four days weekly. Reading achievement was assessed via pre- and post-testing. The t-test analysis compared the control and experimental groups' significant gains in reading achievement. The study also reported significant gains for the students who attended WTR daily. The study also recommended the application of the process of WTR in reading class.

The effect of writing on reading was also explored by Rundle-Schwark (1992). She conducted a study using sixty one fifth grade students. The study used some writing activities in reading class, involving workbooks, skill worksheets and assigned comprehension questions. The study reported that the processes of writing positively affected reading ability,

specifically reading comprehension. The performance of the students in reading and writing was favourable when compared with students in the traditional classroom. Another study was conducted by Hamby (2004) to investigate the effect of explicit writing instruction on writing and reading for grade six students. The sample consists of 124 students from tow schools. Students in school A was the treatment group and received the explicit writing instruction, while school B not. The study reported significant gains in reading for sixth grade students who participated to the study.

Classroom discussion is an activity teachers can utilize in reading class. The importance of this activity was illustrated by Moffett and Wagner (1991). They believed that this activity gives an opportunity for students to ask questions that help them to know more about things they had not experienced. This discussion could have a strong effect on student achievement. Foertsch (1992) stated that:

> In general, eighth and twelfth grade students who reported more frequent class discussion had average reading achievement. For example, twelfth graders who reported being asked by their teachers to discuss their reading on a weekly or monthly basis had significantly higher proficiencies than those who said they did so less often. Also, students at both grade levels who said their teachers asked them to engage in vocabulary discussion on at least a monthly basis, performed better than those who reported being asked to do so less often, and those who reported being asked to explain their understanding and discuss different interpretations of what they had read had higher proficiencies than those who reported never doing so (p.10-12).

This result was confirmed by Lawrence and Snow (2011) who stated that some studies found a strong correlation between discussion and reading achievement. Students enjoy discussion because they find it an opportunity to practice their skills (Perren, 2010).

Reading class activities have an observed affect on student reading achievement. Thus, variety in reading activities in class could meet the different needs of students, which could help teachers to enhance students' performance.

Characteristics of Good and Poor Readers

Good student readers usually have different features than poor readers. Students who read with ease, accuracy, and understanding tend to read more to develop their vocabulary and knowledge (Pang et al, 2003). Pressley (2002) outlined the characteristics of a good reader within a proposed framework of three stages. In the first stage the good readers identified their reading goal, skim the text, and activate their previous knowledge before they read. During the second stage, these individuals read on time, have the ability to predict what is coming in the text, identify important information, and identify the best strategy to process that information. In the third stage, they can merge the text ideas to get the main ideas of the text. After reading they can mirror what they have read, can recount the text and they think to use the new information in future. Furthermore, according to Duke & Pearson (2002) good readers "do not read even traditional texts linearly. Readers routinely skip ahead to sections of a text that they believe are most relevant to their reading goals or return to reread sections they first encountered much earlier in the reading" (, p.232).

According to Carbo (2008), because the brain of a good reader is working and thinking while they read, they are also good at comprehension. The intent of good reader can be managed by their reading achievements. Pressley (1998) stated that a good reader can read about 200 words per minute when they read to learn material, while they can read between 250 to 300 words per minute when they read with more relaxed manner. Some good readers read tardily to reflect and understand the meaning of the text (Guyne, 2009). The vocabulary size of good readers was evaluated by Alderson (2000) as being from 10.000 to 100.000 words which supported their proficiency level and comprehension.

Some students are depicted as low reading achievement students or poor readers. The characteristics of a poor reader are opposite from good readers. Readers who are not fluent have a difficult time recognizing words, understanding various type of reading materials and lack the motivation to continue reading. Poor readers are also likely to not read as much as their counterparts who are good readers (Chard, Vaughn and Tyler, 2002). Poor readers were described by Ziegler and Goswami (2005) as readers who had poor phonological awareness skills.

Reading Assessment

Reading assessment is the technique used to evaluate students' reading development and improve teaching materials and teaching methods. Assessing the performance of students is necessary in order for school administration to be able to develop efficient and effective policies and programs that coincide with the needs of the students (Torgesen, 2006). Morris (2002) suggested that teachers should use the outcome of children's reading assessment to modify their teaching methods. The purposes of reading assessment were detailed by Caldwell (2008). He proposed that the examiner should understand the assessment procedure to identify good reader behaviours, use the good reader behaviours as the criteria to identify the reader weaknesses, know the reading level of reader (which would help to provide the appropriate reading material) document the reader's progress and use these documents to follow the reader progress.

Two types of reading assessments were identified by Pang et al (2003). The first is the diagnostic test, which clarified the weaknesses of the reader and suggested solutions, while the second type of reading assessment is used to evaluate the students reading progress. Pang et al suggested that both types of assessment are required for effective reading instruction. According to Moss et al (2006), in following the guideline set by the Reading First Initiative, assessing the reading performance of students should focus on the five main components of

reading instruction which are: phonemic awareness, decoding, fluency, vocabulary and reading comprehension.

Different components of reading require different assessment methods. According to Pang et al (2003) teachers' questions are the most common tools to assess students' comprehension and questions asked should be clearly concern the main ideas of the text. Applegate, Quinn and Applegate (2002) were more specific in saying that open ended questions are the best assessment method to measure student comprehension and assess students' ability to use the text information to explain their thinking

Teachers listening to their students reading aloud is an assessment method most commonly used to assess student fluency (Pang et al, 2003). According to NRP (2000) the students fluency is assessed in the classroom by number of informal procedures, and these assessment procedures are based on students' oral reading of text. Armbruster et al (2003) indicated that formal and informal procedures should be used to evaluate the development of students' fluency. The assessment of fluency covers the three components of fluency: accuracy, automaticity and prosody. The accuracy and automaticity of the readers can be assessed and quantified by reading rate or percentage, while the prosody assesses quality (Rasinski, 2004).

Assessing vocabulary is considered to an effective tool for evaluating student's progress in reading. The purpose of assessing vocabulary is to evaluate student's knowledge about the essential meaning of a given word (Klingner, Vaughn & Boardman, 2007). Vocabulary assessment is based on the vocabulary size of students, the students' ability to use the word and acquisition of the particular word taught (Paratore & McCormack, 2005). According to Musti-Rao, Hawkins, Cartledge and Utley (2009) there are many ways to assess students' vocabulary. Firstly, in some cases students are asked to read a sentence or passage and then are asked to find the synonym for an important word in the text. Alternatively,

vocabulary assessment may involve the students being asked to match between the word and its meaning.

Factors Affecting Reading Achievement

Reading achievement is affected by various factors, which have the potential to result in high and low reading achievement. According to Spor and Schneider (1999) factors such as home environment, economics, motivation, classmate and diversity can affect reading achievement.

Socio-economic status has been found to have a significant effect on students; reading achievement. According to Russ et al (2007), one of the major determinants of literacy rates has been identified as the low income of families. Children in these families hear and learn fewer words, which limits their vocabularies and places them at educational risk. The percentage of low income students in grade four who scored below proficient levels was 85% on the 2009 reading test administrated through the National Assessment of Education Progress (Viadero, 2010).

Home environment is another factor affecting students' reading achievement. Home literacy environment was defined as when parents read to children, their reading ability is likely to improve(Butdisuwan, 2007). Five reading activities were suggested by Peters (2007) to parents to improve their children's reading: (a) let your child see you reading different types of reading material frequently, (b) lay enticing books in every room, even the bathroom and car, (c) read for the child all the time, not just at bed time, (d) give them books as gifts and visit the library and (e) browse the books with them. The quantitative meta-analysis study conducted by Bus, van Ijzendoon and Pellegrini (1995) focused on studies examining the frequency of book reading to preschoolers. The study reported the significant correlation between parents reading book and reading achievement r=.27, and they noted that parents reading books was a strong predictor of reading achievement. The correlation between

reading level of first grade students and the amount of time parents are involved with their child in reading activities was examined by Peissig (2002). The Development Reading Assessment Kit was used in the beginning and end of the school year to assess students' development in reading level and comprehension. The time spent at home reading (child reading to parents, or vice versa) was reported every day by parents during the month. The result showed significant relationship between parental involvement with their child in reading activities and their child's reading achievement $r = .65$.

Students reading achievement is also based on their reading motivation, and as a result, motivation is a factor which affects student achievement. A study was conducted by Filandro (1981) to assess the correlation between the motivation to read and reading achievement. A sample of 22 grade five students responded to a motivation questionnaire, while their reading achievement was assessed by the Gates Macginitie Reading Test. The study showed strong and positive correlation between motivation to read and students reading achievements. The motivation of students enrolled in kindergarten through to third grade was assessed by Hussien (1998). Students' reading achievement was measured pre and post-test by the Wide Range Achievement Reading Test and students' motivation was assessed by their teachers using Teachers Questionnaire on Students Motivation to Read (TQR). The TQR consists of 15 items, each the with response categories not applicable, rarely, seldom, sometime and often. Student motivation was observed for one month and students were rewarded for the number of books read twice during the study. The correlation between motivation to read and reading achievement was examined and the result showed significant correlation between the variables ($r = .32$). A study conducted by Unrau and Schlackman (2006) examined the effect of motivation on reading achievement. A sample of 1032 (80% Hispanic and 20% Asian) students in grades 6, 7 and 8 participated in the study. Development of the Motivation for Reading Questionnaire was used to assess student motivation and

students' reading achievement measured by the Gates-MacGinitie Reading Test. The results indicated that reading achievement had a stronger relationship with intrinsic motivation and extrinsic motivation in the Asian group when compared to the Hispanic group. In the Asian group, intrinsic motivation had a positive correlation with reading achievement while extrinsic was negatively correlated. For the Hispanic group, neither intrinsic motivation nor extrinsic motivation had a direct effect on reading achievement that was statistically significant. A similar study was conducted by Pecjak and Peklaj (2006) to examine reading motivation of primary schools students' in Slovene. A large sample participated in this study, with 1042 students from grade three and 1124 students from grade seven. The study used two types of questionnaires to assess students' motivation. The participants in grade three responded to the Reading Motivation Questionnaires for Young students, while grade seven students responded to the Motivation for Reading Questionnaire. Reading achievement in both grades was evaluated by their teachers, and students were classified into groups labelled poor readers, average readers and good readers according to their reading achievement. The two-way ANOVA was used to examine the differences in motivation according to students' achievement in reading. In both grades, the result showed significant effects were found, indicating that those in the good reader group were more motivated to read than poor readers.

There is a gender bias in reading achievement, with boys generally having lower levels of reading achievement than girls (i.e. Millard, 1997; Rosen, 2001). Zambo and Brozo (2008) noted that it is commonly believed that girls have higher reading achievement than boys. The result of the first phase of a study conducted by Alloway, Freebody, Gilbert and Muspratt (2002) highlighted differences between boys and girls reading achievement in Australian primary school students. In 2002, The Nation's Report Card evaluation conducted in the United States detailed higher average scores for girls in grades three and eight than boys. A study across countries was conducted by Johnson (1973) to examine the belief that

girls are better than boys at reading. A sample of 1081 students in grade 2, 4, and 6 from four countries who speak and read English (United States, Canada, Nigeria and England) participated, and students responded to tests which measured vocabulary, reading comprehension, structural analysis and three aspects of phonics. The results of the Canadian students showed, significant differences in grade two in comprehension, variant consonants and vowels that favoured girls. Also, Canadian girls in grade four demonstrated higher skills on the variant consonants and test of structural analysis. The Canadian boys showed significant differences in the vocabulary test. No significant differences were found between boys and girls for the English students groups in grade two, while boys in grade six were higher than girls in vocabulary and grade four boys were higher than girls in vocabulary, beginning consonants, variant consonants and vowels. The Nigerian student results showed boys achieved higher scores than girls in most tests, while girls were higher than boy in grade four in beginning consonants, variant consonants and structural analysis. The statistical analysis showed significant differences in the grade two groups, all favouring boys in the phonic skills. Within the United States, girls' student cohorts were better than boys in reading. The girls in grade two and grade four were better than boys on variant consonants, and the grade four girls were also better on comprehension. The result also showed that female students in grade six were better than boys on structural analysis. According to Lokan, Greenwood and Cresswell (2001) all countries showed significant differences in term of gender in the Programme for International Student Assessment (PISA), managed by the Organisation for Economic Co-operation and Development (OECD).

The report stated that:

> All gender differences were significant, ranging from a low of 14 points in Korea to highs of 53 points in Latvia and 51 points in Finland. Next highest were New Zealand and Norway, with differences of 46 and 43, respectively. The difference was 30 points

> or more in 19 of the 31 participating countries. In Australia the gender gap on total reading literacy scale was 34 points (p. 34).

A study was administrated by White (2007) to analyse archival data from the reading component of the Ontario Secondary School Literacy. The research considered the question of whether girls are better readers than boys. Students' reading achievement was measured by the Ontario Secondary School Literacy Test, which assesses three reading skills: (a) directly stated ideas and information; (b) indirectly stated ideas and information; and (c) connections between personal experiences and the ideas and information found in selection. The skills were assessed using three text types that were informative, graph and narrative. The responses of 113,050 grade 10 students were used in this study. The MANOVA result showed significant effect for the gender and the girls reading results were found significantly exceed the boys reading achievement. Most of the previous studies confirm that girls stand out in reading more than boys, which implies that the girls may have more interaction with reading curricula.

Summary

This chapter is presented in two sections; this thesis examines a range of conceptualizations detailing the styles of learning, as they apply suited to an individual, in order to optimise their learning. This chapter includes the definition of terms used in this thesis to review the literature related to learning styles, and highlight issues or concerns in the learning style domain either examined in the literature or perceived as a shortfall in the existing literature.

The first section explored the concept of learning styles, explaining that there are a number of different research viewpoints. Some researchers presented a simple method to describe 'learning style' (Slavin, 2000), while others pointed out that there is no generally agreed definition of the term (Suski, 2002). Others pointed out that learning style refers to

individual differences in approaches to learning based on preferences (Atkin et al, 2001; Dunn et al, 2002; Gregorc, 1979; Petrus-Vancea, 2009). Others stated that learning style refers to the ability of the individual to adopt the method that most effectively acquires information, and retains it (Felder et al, 2002; Kolb, 1979; Reinert, 1979). Otherwise, Guild et al (1998) Riding et al (1999) Jackson (2005) consider learning styles as the component of the individual personality, while others look at learning styles as social psychology (Fuhrmann et al, 1983; Jonassen et al, 1993). This part of the chapter also introduced the differences between learning style and cognitive style, which was a critical point for many researchers such as James et al (1995) and McFadden (1986).

There are many theories of learning style, and most of these theories make use of: Kolb's theory, Dunn and Dunn's theory, VAK theory, the Felder-Silverman model,, the Gregorc Model and the VARK model. Each learning style theory has its one measurement derived from it's which depends on the theoretical basis of the theory. The reliability and validity of learning styles measurement was the aim for the researcher, some of whom recommended more studies to examine learning styles measurement, while other recommended their tools as the valid tools for learning styles.

Factors such as gender, age and culture affect individual learning styles. In terms of gender, some studies Dobson (2009), Lincoln et al. (2006),Wehrwin et al. (2007) found differences between males and females in learning styles. In regard to age, Price (1980) and Price et al. (1981) indicated that younger learners were more kinaesthetic in nature. Hlawaty (2008) reported that each age has special learning styles, despite Isman et al. (2008), Vafe (2002) stating that there are no statistical differences in learning styles according to age. That earning styles are affected by culture was the conclusion drawn from studies conducted by Charlesworth (2008), Ewing et al (1992), Tseng (1993) and Park (1997a&b).

In this part of this chapter, the relationship between academic achievement and learning styles was discussed. Learning styles have a significant influence on learners' academic achievement, as shown by studies such as Wallace (1992) and Yazicilar et al (2009). These studies reported students' academic achievements as being negatively affected if they were taught by teaching methods that did not fit their learning styles. According to Matthews (1996) and Ozkan (2003), higher achievers have different learning styles to lower achievers. The relationship between reading achievements and learning styles was examined by many researchers, for example, Price et al (1981), Caldwell et al (1996) and Foley (1999). They reported that the learning styles of high reading achievement students differed to that of students with low reading achievement. In this part, the effect of some learning styles elements (e.g. sound, intake and time of day) on reading achievements was also examined.

The second section in this chapter discussed reading. Reading approach refers to the method used by teachers to teach reading to students. The reading approach influences the reading program that is used in the school. Most reading programs are based on a specific underlying theory or approach to teaching reading. Phonics and Whole Language are the major approaches to teaching reading. Many studies were conducted to examine the effect of phonics approaches on students' reading achievement (e.g., Kilcrease, 1989; Share et al,1984). These studies reported that using a phonics approaches increases students reading achievement. The researchers also examined the whole language approaches and they indicated that whole language has positive impact on students reading achievement (Clay, 1990; Engelhardt, 2000).

This section also discussed reading resources in the classroom, and how they create a unique environment to assist students to develop their reading skills. Different resources can be used for reading activities in the classroom, such as books, computers and CD-ROMs. Reading skills such as comprehension, vocabulary and fluency were discussed in this section.

Students were found to be different in reading preferences. Some reading experts divided people into three categories according to their aim in reading, such as Ogunrombi et al (1995), while Taberski (2000) classified students into four categories according their habits in reading: transitional readers, early readers, fluent readers and emergent readers. Present day reading habits differ to those in the past according to Joint (2008). Furthermore, reading habits differ from country to country (Bratovic et al, 2010).

This section also discussed characteristics of good and poor readers. Good student readers demonstrated different characteristics to poor readers (Pang et al, 2003). Characteristics of good readers were identified by Pressley (1998, 2002), Duke & Pearson (2002), Carbo (2008), Guyne (2009), Alderson (2000), while Chard (2002) and Ziegler (2005) outlined the characteristics of poor readers.

This section subsequently discussed reading assessment. The type of reading assessment depended on the type of reading skill to be measured and the aim of assessment. The factors which affect reading achievements such as socio-economic status, home environment, motivation and gender were discussed in the last part of the second sections.

This thesis aims to examine the common learning styles within high and low reading achievement. This study adds to the body of knowledge in this important aspect by examining the learning styles of grade seven and eight Saudi students who were high or low in reading achievement. The next chapter considers the development of the Saudi education system and the reality of teaching reading in Saudi preparatory schools.

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Chapter 3: Reading Pedagogy in Saudi Arabia

This chapter presents an overview of the educational system in Saudi Arabia. It includes a profile of the country, the main characteristics of its education system, development options for the system, and benefits and constraints pertaining to those options.

Profile of Saudi Arabia

Saudi Arabia is located in south-west Asia and is the second largest country in the Arab world. It occupies more than 2.25 million square kilometers (Al-Shareef, 1995). Saudi Arabia has large border (see Figure 6). It is bordered on the west by the Red Sea, to the south by the state of Yemen, to the east by the Arabian Gulf and the states of Qatar, the United Arab Emirates and Oman and to the north by the states of Kuwait, Iraq, and Jordan (Al-Shammari, 2009)

Saudi Arabia is divided into 13 administrative divisions, collectively contaning over 6000 cities, towns and villages. The six main cities are: Riyadh, the capital, in the central region (Najed); Dammam, the main port, in the eastern region (Al-Ahsa); Mecca and Medina the Holy cities of Islam; Jeddah, the main port, in the western region (Al-Hijaz); and Abha in Asir (the southern region). Most of the population is concentrated in large cities such as Riyadh, Jeddah, Dammam, Mecca, Taif and Medina (Al-Sadan, 2000, p.144). The total population of the Kingdom of Saudi Arabia is 27.136.977, of whom 18.707.576 are Saudi nationals (Central Department of Statistics & information, 2010).

The official language in Saudi Arabia is Arabic. It is the sacred language of the Holy Quran and therefore of Islam, although English and other European languages are widely used by banks and companies that employs or serve non-Arabs (Al-Sadan, 2000). Subsequently, Saudi Arabia is widely considered as the heartland of Islam- its constitution is based on Holy Quran, and its law is the Islamic Sharia (Hurst, 1983).

Figure 6. Map of Saudi Arabia

Source: Maps of world (2008).

The kingdom of Saudi Arabia, commonly referred to as Saudi Arabia, was first established in 1902 by King Abdualaziz Al-Saud. It was formally founded in 1932, when Abdualaziz Ibn Abdur-Rahman Al Saud, who was simultaneously King of Hijas and Sultan of Najd and dependencies, united the two parts of his state under one administration (El-Mallakh, 1982).

Education Development in Saudi Arabia

It is possible to divide the history of education development in the Saudi Arabia into two basic stages, comprising the periods before and after King Abdualaaziz Al-Saud's establishment of the Saudi Kingdom. These will henceforth be known as the pre-Saudi and post- Saudi eras.

Education in the pre-Saudi era.

This stage of education's history is also known as the traditional education stage. Al-Aqeel (2005) stated that education in the pre-Saudi era was practiced in a very narrow range and that education was absent from a very great sector in the nomads area and rare in the urban sector. Al-Hamed, (2007), and Al-Gamedi (2005) both assert that only three types of education existed in the Arab Peninsula, particularly around this time: Mosque education, Katateeb and schools, (both public and private).

Mosque teaching.

Mosque education, both in general and at the two Holy Mosques (Makkah and Al-Madinah), was considered to be one of the most continuous and consistent education systems at this time (Msheemsh, 1998). According to Al-Aqeel, (2005) and Metwalli (2008) the reason for such continuity and consistency was due to the Holy status mosques possess amongst all Muslims, especially the aforementioned Holy Mosques. Al-Salloom (1986) referred to three types of teaching and learning seminars at the Mosques. The first type is the corners seminar. This was managed by individuals with sufficient knowledge in language sciences, mathematics, and life. The second type was called the Asateen seminars and was managed by the religion and fatwa scholars. The third type was known as the Chairs seminars, also referred to as the storytellers, in which the stories and events past nations were recited.

The education at the two Holy Mosques reflected the highest stages of Arabic and religious education because they played a major role in teaching religion sciences and the Arabic language as well as creating a scientific environment based on dedication and commitment to learning and achievement(Al-Shamekh, 1985). According to Al-Aqeel (2005) the overwhelming part of Mosque education has no set curriculum as is the case in

current education institutions- rather, it was conducted in form of seminars in which the student selects that which they desire to learn.

Al-Katateeb education

Al-Katateeb is the second type of education that was prevalent during the pre-Saudi era. According to Al-Salloom (1986) Al-Katateeb emerged at an early stage of Islamic history and prevailed in many regions in the Arab peninsula. They were considered as basic, informal institutions staffed and taught by figures known as Al-Mutawe, who often the Imam of local mosques. Al-Katateeb teaching was mainly based on indoctrinating students in the alphabet and reading and writing the verses of the Holy Quran. According to Al-Shamekh (1985), Al-Katateebs were prevalent in Al-Hijaz, Al-Ehsa', Al-Qaseen, Aseer, Tohama and Najd, but the number of these Katateebs was much greater in Makkah and Al-Madinah.

According to Al-Hamed (2007) in the Eastern region there were three major types of Katateebs. Kut'ab for specific teaching, memorizing and reciting the Holy Quran; Kut'ab for teaching the Holy Quran and teaching reading and writing principles; and Kut'ab for teaching mathematics, and the reading and handling of books. Al-Hamed further stated that Al-Katateebs, in particular, accepted children from early ages till ten years of age. Students could remain in Al-Katateeb anywhere from one to four years depending on the student's level and capabilities.

Schools education:

School-based education is the third and final type of education within the pre-Sausi era. Ibrahim (1985) listed three types of schools that existed in that period: The Ottoman schools, the Hashemite schools and Private schools.

The Ottoman Schools**:** comprised the first attempt towards the establishment of systematic education in Al-Hijaz and the Eastern region areas under the supervision of the

Ottoman government (Al-Hamed, 2007). Al-Shamekh (1985) noted that the educational system at these schools consisted of three stages: the primary stage, with an education period of three years, followed by Rasheede'a stage three years, then the secondary stage, which is of two types: the first was five years and the second was seven years. A Rasheede'a school in Makkah was one of the first formal schools founded by the Ottomans between 1883 and1885. Following this, similar schools were founded in Madinah, while in 1910 the first Rasheede'a school was founded in Jeddah and another in Al-Taef in 1911 (Al-Aqeel,2005; Al Hamed, 2007; Al-Shamekh,1985). According to Al-Aqeel (2005) the subjects taught at those schools included Turkish language, mathematics and history, and most of the teachers were Turkish, teaching in the Turkish language, this resulted in a significant reluctance within many parents to send their children to such schools.

The Hashemite schools were the second model of schools prevalent during pre the Saudi era. These Hashemite schools were established by Al-shareef Hussain Ben Ali after gaining independence from the Ottoman authority in 1916 (Mursi, 1988).

According to Musleh (1981) the Hashemite preparatory charitable school was the first school established at the time of Al-Shareef Husain. This was followed by two primary schools, one secondary school, one agricultural school and one warfare school, all in Makkah. Al-Aqeel (2005) described the scientific level of these schools as not well-developed and as not meeting the purpose that the schools were established for.

Private education: according to Al-Aqeel (2005) and Al-Hamed (2007) the formal authority's failure to build an integrated educational system in pre the Saudi era forced the general populace, especially in Al-Hejaz, to open the schools themselves.

The Soltia School in Makkah was the first private school. It was established in 1875 thanks to Shaikh Mohammad's own efforts with financial support from a wealthy Indian woman. The school then carried the name of the Indian woman (Al-Shamekh,

1985). In 1880, the Al-Fakhre'a school was opened, with support from the Indian community's in Makkah. Al-Fakhre'a school was comparable to the Soltia School in terms of its curriculum (Musleh, 1981). Musleh (1981) also mentioned that the majority of students in both the Soltia and Al-Fakhre'a schools consisted of children from the Indian community. This had encouraged Sheikh Mohammad Husain Khayat one of the Makkah traders to open a school by the name Al-khairi'a, operating with curriculum that was largely the same as that of the Soltia School with some amendments and expansions. This school was free and enjoyed the Makkah residents' direct support and contribution.

In 1905 Muhammad Zainel founded the Al-Falah school in Jeddah, followed by another campus in Makkah seven years later. In its first year, 200 students were enrolled at Al-Falah schools in Makkah. These schools had three stages: a preparatory stage three years, an elementary stage and a Rasheede'a stage, each of which lasted three years (Al-Hamed, 2007). Al-Fakhre'a and Al-Falah schools were considered to be of the most important educational institutions in Al-Hejaz region, because a great number of scholars, literature and political figures graduated from them in the Kingdom of Saudi Arabia (Ibrahim, 1985).

Post-Saudi era education:

The development of education in the Saudi era has gone through several phases to reach its current status (Al-Gamedi, 2005). These phases are listed below:

***The first phase*:**

Establishment phases, lasted from 1901 to 1924(Al-Gamdi, 2001).When King Abdualaziz Ben Abd Al-Rahman regained power over Riyadh, he showed special interest in education, especially in educating nomads. He sent scholars to the villages to teach religion affairs and to disseminate science under his authority during that period.

The second phase

It was the foundation phase (1925-1953). According to Al-Sabeet (1995) this phase began when King Abdualaziz' Al Saud took control of Makkah in 1924. When Makkah became king under the Saudi rule, King Abdualaziz called for the establishment of the educational board in Makkah. The board included a number of religious and literary scholars. Al-Aheedab (1978) mentioned that the 1925 Royal Decree concerning the creation of the Directorate of Knowledge, was performed following the experiences of some scholars in the Arab countries such as in Egypt and Al-Sham, and was one of the most important milestones in this phase of development.

After the foundation of the Directorate of Knowledge, Saudi education entered a new era. The most prominent aspect of this phase was the opening of the Saudi Scientific Institute in Makkah in 1926. In 1928, it was decided that the education system would include four stages: the preparatory stage, the primary stage, the secondary stage and high school stage. In 1949, the first Sharia College was opened in Makkah, while the first Teaching college was created in 1952 (Al-Zarkali 1965).

The third phase

Historians said this stage was the phase of expansion and prevalence of education, in which legal principles and legislation related education were established. This phase lasted from 1953 to 1979. According to Al-Gamedi (2001), the most notable event of this period was when the Directorate of Knowledge became the Ministry of Knowledge in 1953. In 1957, the Ministry of Knowledge called for the first educational conference to be held in order to address issues concerning the education sector, tackle some of the problems facing the sector and draw plans for its future. Amongst the conference recommendations was the extra care for technical education and the expansion of industrial education as well as establishment of, King Saud University, the first Saudi university.

In 1960, a royal decree was issued regarding the establishment of the General Directorate for Women Education, which held the responsibility for the planning and supervision of women's teaching. This was followed by another royal decree in 1963 ordering the formation of the Higher Committee for Education Policy in the Kingdom to take charge of the education development policy (Ministry of Knowledge, 1998).

The fourth phase

This was the stage of the comprehensive planning of education in conjunction with the Kingdom's five-year development plan. This phase extended from 1970 to 2002 (Al-Sabeet, 1995).

One the most significant features of this phase was the package of rules and regulations put in place regarding the administration of educational institutions, according to Al-Gamedi (2005). The most important regulation was the Education Policy Document, a fundamental reference for the Kingdom's education system, its goals and the implementation of the related regulations. Al-Gamedi (2005) also stated that there were an increased number of education directorates in the regions reaching 42 directorates nationwide.

Al-Aqeel (2005) stated that one of the most important developmental aspects of this phase involved the Ministry of Knowledge abdicating some of its central authority in favour of to regional educational directors. In 1974 a royal decree was issued, establishing the Ministry of Higher Education which was to take over the supervision on the Kingdom's universities. Another royal decree was issued in 1990, establishing the Technical Education and Vocational Training General Authority.

The fifth phase

This phase started in the year 2002. Al-Gamedi (2005) considered this a milestone in the Kingdom's education history due to the Royal Decree combining the General

Directorate for Women Education with the Ministry of Knowledge. A year later, another royal decree changed the name of the Ministry of Knowledge to the Ministry of Education.

General Goals of Education in the Kingdom:

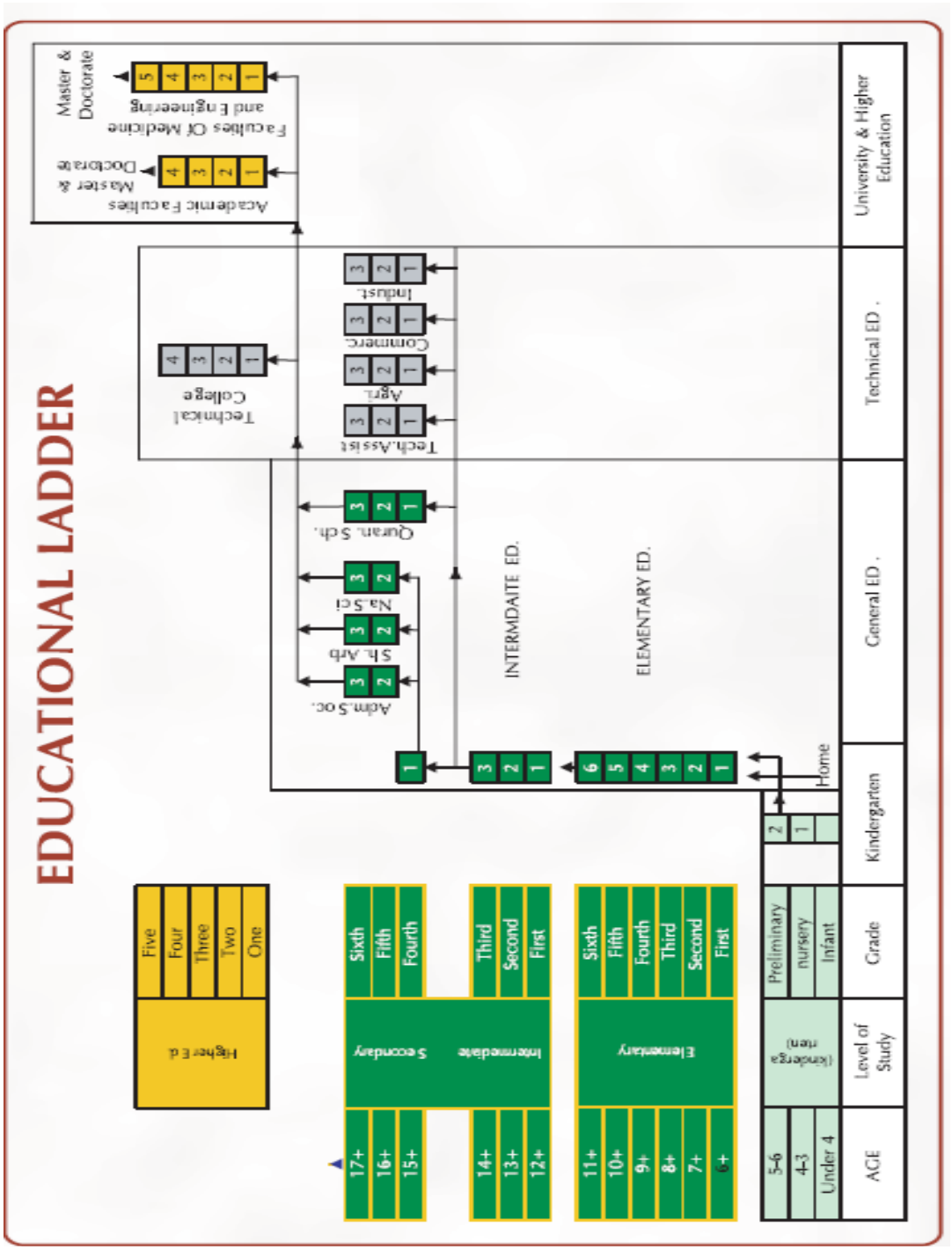
The education system's goals sre, in essence, based on the Islam derived principles and orientations of Saudi society. Al-Aqeel (2005) stated the general goals of the Saudi educational system concern the individual's moral, cognitive and professional skills. These goals are coherent and interwoven. Al-Gamedi (2005) and Metwalli (2008) stated that the general goals of education, as outlined by the Saudi Education Policy Document, were as follows: cognitive goals, aimed at provided learner with basic cognitive skills and developing their learner's mental abilities in a way that enables them to benefit from this cognition for their life (Al-Gamedi, 2005; Metwalli, 2008); proficiency goals**,** concerning the development of functional skills that equip the learner with the flexibility in the ability to accurately perform tasks (Al-Gamedi, 2005; Metwalli, 2008). moral goals, the educational system in the Kingdom works through emotional goals outlined in the Education Policy Document to develop the moral aspect and the related feelings, attitudes, concerns, trends and positive values towards science and society. This is to help the Saudi learner direct their energy and exert their efforts in accomplishing their tasks and developing their awareness towards society's problems (Al-Gamedi, 2005; Metwalli, 2008).

The Education's Ladder in the Kingdom of Saudi Arabia:

The Saudi education system implements the (6-3-3) methods, meaning six years primary education, three years preparatory (intermediate) and three years for secondary education. Al-Sonbol (2008) described this style of organizing the educational ladder as the most comprehensive and wide spread style of education in the Arab world. Additionally, Al-Gamedi (2005) illustrated that the organizational structure in Saudi

Arabia includes different styles of education besides that of public education. He adds that before there is pre-school education, which includes three levels: childcare, kindergarten and prep. There i also technical education which includes two levels: the secondary stage and the higher education stage. There's also the higher education at university faculties and higher institutions that allow students to obtain Bachelor, Master’s and Doctorate degrees. Al-Sonbol (2008) mentioned that the Saudi educational structure includes styles of equivalent education such as the special education, adult education, private education and the Holy Quran schools. Figure 7 illustrates the Saudi education's ladder.

Figure 7. Saudi educational ladder.



Source: Saudi Arabian Cultural Mission, 2006.

Education's Funding in Saudi Arabia:

Policy in Saudi Arabia states that the government is responsible for educational funding; meaning education in all styles and stages is free for all citizens and residents.

Private education is excepted as it is privately owned and students pay fees (Al-Hamed, 2007). Despite this, the government continues to support the private education institutions financially and otherwise, helping them satisfy their educational responsibilities and represent the different educational sectors. Without government support to the private education sector, study fees would be much higher (Al Sonbol 2008).

Furthermore, Al Sonbol (2008) indicated the status of education between the different developmental sectors in Saudi Arabia. This status is reflected by in the enormous funding the government allocated for this sector to implement education policy in Saudi Arabia pursuant to article number 230 of the policy, which states that the government should increase the education budget to meet the country's increasing educational needs. This budget should also be increased in line with the public budget. Table 1 illustrates the growth in the education budget in Saudi Arabia from 1970 to 2011.

Table 1

The Growth in the Education Budget in Saudi Arabia

Financial year	State's budget B SR M	Education Budget		M education sector		F education sector		Higher education	
		SR M	% of General Budget	SR M	% of Education Budget	SR M	% of Education Budget	SR M	% of General Budget
1970	6780	666	9.8	431	64.7	127	19.1	108	16.2
1975	110935	12941	11.7	8986	69.4	1857	14.4	2098	16.2
1980	245000	21294	8.7	9636	45.3	3872	18.2	7528	35.4
1985	200000	23540	11.8	10459	44.4	5462	23.3	6692	28.4
1990	156246	24214	15.5	10639	43.9	8107	33.5	4644	19.2
1995	160000	25624	19.9	12684	49.5	8020	31.3	4202	16.4
2000	185000	41275	23.3	16767	40.6	16414	39.8	6589	16
2007	368654	74468	20.2	30534	41.0	26167	35.1	11.478	15.4
2011	580000	150.000	25.9	90.000	60	Male and female		60.000	40

Source: Al-Sonbol, 2008. & Ministry of Finance, 2011.

Al Hamed (2007) concluded that when comparing the funding allocation for education to the state's overall budget, it is clear that spending on education as a percentage of the state's general budget during 2007, was more than double that of education spending in 1970. The percentage of the overall budget allocated to education has risen from 9.8% in 1971to 27.67% in the year 2005. Al-Sonbol (2008) pointed out the differences in education budget allocations. The spending goes to eight educational areas: management and organization, the educational process, developing the functional system, educational development, student's services, out-of-class activities, construction and facilities maintenance. It is noted that the expenditure on education is always the highest because it is considered as the basic activity through which the goals of the educational systems are achieved.

Development of Boys Education

Public education in Saudi Arabia is, notably divided along the line of gender. The division is in line with the attitudes of the Saudi society which is based on the Islamic principles that prohibit intermingling between men and women (Al-Aqeel, 2005). The Ministry of Knowledge (1999a) stated that primary education consisted of two basic styles: village schools and primary schools. The first type refers to schools in rural areas where the number of the students in each school is less than 60, managed by one or two teachers with a study period of four years. The second refers to city schools with a over 60 students and study period of six years. The Ministry of Knowledge noted the village schools were cancelled in 1954, while primary schools continued.

The Directorate of Knowledge played an important role in difficult circumstances, since it was in charge of managing the education process while there were as four primary schools in Al-Hejaz. The construction of schools continued, reaching 306 primary schools by r 1933 (Shalabi, 1987). The Ministry of Knowledge (1994) mentioned that, the number

of primary schools increased after fifth year of the Ministry's age, it become 518 schools with 79274 students and 3085 teachers working in these schools.

According to Al-Salloom (1986) the ministry developed and implemented its first five-year plan for the opening of new primary schools in 1961. 100 primary schools were opened by 1965, as priority was given to primary education. The Saudi Ministry of Knowledge (Ministry of Education) acknowledged the importance of this kind of education. The quantitative development primary education continued until the seventh five-year plan. Table 2 summarizes the development of the boys' primary education from the academic years 1969-1970 till 2003-2004.

Table 2

The Development of Boys' Primary Education

Academic year	Schools	Classes	Students	Teachers
1969-1970	1383	10972	267529	12157
1975-1974	2067	16891	391677	20454
1980-1979	3638	26607	517069	28156
1985-1984	4413	34801	688170	45405
1990-1989	4806	42763	919949	55381
1995-1994	5417	50194	1045401	68200
2001-2000	5790	52438	1058563	78898
2004-2003	3686	61460	1219569	96375

Source Al-Aqeel, 2005, p83

Metwalli (2007) listed several reasons for the significant increase in the number of primary schools in Saudi Arabia. this reasons including: a) the significant population growth (which exceeded the world's highest growth rates) resulting in a vast increase in school age children; b) the Kingdom's interest in providing financial support to

disseminate and generalize primary education in all cities and villages in the kingdom; c) the principle of equal education opportunities and full accommodation for all primary school age children; d) increasing social awareness about the importance of education in children's future, and as a consequence, the development of primary education. As a result, there was further development in the following education stages. Both Alotibi (2005) and Al-Zamel (2008) pointed out that the increase in population forced the Ministry of Education to hire buildings to use them as schools. The schooling environments in these buildings, however, were very poor due to severe overcrowding.

Preparatory education in the beginning was in conjunction with secondary education (Al-Salloom, 1996). Students attended a general exam for the preparatory competence certificate, and at the end of their third year, successful students would be able to continue their education at a higher stage. 1958 saw preparatory education become a separate stage to that of secondary (high school) education in the kingdom (Al-Aqeeli, 2005). The Ministry of Knowledge (1998) stated that preparatory education continued to be an independent stage until the year 1972, when it was combined with the primary stage. This plan was to encompass all primary school students, but continued for only two academic years. After which preparatory education was once more an independent educational stage with its own goals and curriculum.

The structure of the public education system in the Kingdom of Saudi Arabia is completed by the secondary stage. Students can enrol in secondary school after successfully completing the preparatory phase. Al-Aqeel (2005) indicated that the study at the secondary stage takes three years, and usually the students enrol when they are 15 years old and finish at 18. Students at this stage study more specialized subjects that provide them with the general literacy that allows them to qualify for university. Abd Al-Jawad (2005) commented that the secondary education developed rapidly in all aspects.

The real start of the secondary education in its modern form in 1936, when Albithat preparation school was established (Al-Salman, 1999). Al-Salman also said this type of education aimed to prepare students to continue their university studies. The study period at this school was five years. It then increased to 6 years, before it was split into two three years phases (preparatory and secondary) (Al-Salman, 1999). In 1942, when there was increasing demand for such education, a secondary school called “Taiba” was founded in Al-Madinah, and another one in Jeddah in 1944. Also in this year, a secondary school called Dar Al-Tawheed" emerged. While, in 1947, a secondary school was founded in Al-Hofoof city in Al-Ihsa', and another one was opened in Abha. In 1950 more secondary schools were constructed in the Kingdom based on the regions needs and the availability of resources (Al-Aqeel, 2005).

The Ministry of Knowledge then Ministry of Education expanded the construction of secondary schools in the following years. Statistics indicate a notable increase in the number of schools, students and teachers from the academic year 1953-1954 till the academic year 2002-2003 (see Table 3).

Table 3

The Development of Boys’ Secondary Education

Academic year	Schools	Students	Teachers
1954-1953	12	1697	176
1964-1963	18	3856	160
1974-1973	141	36774	1356
1984-1983	355	66701	4608
1994-1993	758	196480	10677
2007-2006	2207	538350	39324

Source Metwalli, 2007, p.104

In Saudi Arabia, the secondary stage of education is diverse. Al-Aqeel (2005) stated that this diversification was designed to satisfy the students' increasing both intellectual and psychologically maturity. In addition to the specialization system in the last two grades of the general secondary study, there are secondary schools which follow the approach of Al-Imam University and other schools for the Holy Qurans studies, as well that of as Dar Al-Tawheed secondary schools. These schools focus on religious education, while other types of secondary schools such as industrial, commercial, vocational and agricultural secondary schools. As well as postal and technical secondary institutes, aim to prepare students for vocational work. The study period at these schools and institutes is three years. Also, Abd Al-Jawad (2005) stated that the education system in Saudi Arabia provides schooling opportunities at night secondary schools to students who find difficult to join day secondary school because of their age or work commitments. Such students can also sit for the exams without regular attendance, or from home.

Development of Girls Education

Girls' formal education was neglected compared to that of boys' education for a number of reasons, according to Al-Aqeel (2005). These reasons include the economic situation in Saudi Arabia encountered at its establishment. There were also numerous social and cultural reasons, including to a number of sections of society denying the push for girls' education. This pushed the government to work towards the wider to acceptance girls' education by increasing the role of religious scholars, journalists and academics.

Al-Bakr (1988) stated that the Saudi government was able to persuade Saudi society to accept girls' education by establishing the General Directorate for Girls' Education. Amongst the major tasks of this directorate was the supervision girls' schools and development of these schools' curriculum. General Directorate for Girls' Education (1992) stated that the decision concerning the commencement of girls' education in 1960

set a group of general principles, including that the opening of these schools must be for teaching religious sciences and other sciences that are in line with the Islamic tenet. The decision also ordered the formation of a board under the Mufti's supervision which would organize these schools and other schools that were previously opened, as well as develop and monitor their programs.

The Ministry of Knowledge (1994) mentioned when girls' education was formally approved in the Kingdom, there were nearly 15 private girls' schools: five schools in Makkah, three in Riyadh and six in Jeddah.

Al-Aqeel (2005) stated that the Education Policy Document issued in 1970 included a set of rules and principles for the Saudi educational system in general, and girl's education in particular. These principles include the following:

-The goal in educating girls is to teach them according to the appropriate Islamic principles in order for her to perform her tasks in life; to be a successful wife and good mother; and to prepare her to do what is relevant to her nature, such as teaching and nursing.

-The government must give attention to girls' education and provide all necessary support to engage all girls of an educational age. This is in order to give them the opportunity to access all kinds of education to suit them as women to meet the need of the country.

- Mixed education between boys and girls- is prohibited at all education stages, except in child care and kindergarten.

-Girls' education must be conducted in an atmosphere of decency, virtue and chastity, and must obey Islamic rules in its types and forms.

The General Directorate for Girls' Education applied the Ministry of Knowledge's curriculum with some modifications to some academic plans and subjects. The Directorate

supervised the following types of education: public education in its three stages (primary, preparatory and secondary), female teachers' education institutes, which gradually vanished after the opening of the faculties, education, letters and home economic faculties; and special education of students with mental, visual and intellectual disabilities (Metwalli, 2007).

Growth in the education of girls.

Since The General Directorate for Girls' Education took over the responsibility for girls' education, it began to achieve its goals. Al-Aqeel (2005) Al-Gamedi (2005) Al-Hamed (2007) stated that the General Directorate for Girls' Education has succeeded in rapidly expanding schools, faculties and institutes according to the population's needs. Table 4 shows a statistical summary of girls' education according to stages and education type.

Table 4

The Development of Girls' Education

Education stage	Academic year	Schools	Classes	Female students
Kindergarten	1975-1974	10	100	200
	1981-1980	103	741	21501
	2006-2005	1512	6061	104999
Primary	1961-1960	15	127	0180
	1981-1980	2205	17346	397456
	2006-2005	3452	20319	515803
Preparatory	1964-1963	5	13	235
	1981-1980	011	3712	97252
	2006-2005	3452	20319	015803
Secondary	1964-1963	1	2	20
	1981-1980	175	1583	41819
	2006-2001	2189	17154	462451
Female Teacher Institutes	1961-1960	1	200	7626
	1981-1980	81	58	1242
	2002-2001	40		
Intermediate Colleges	1980-1979	4	Divisions	406
	1981-1980	7	Divisions	1081
	2002-2001	16	Divisions	15357
University Colleges	1971-1970	1	Divisions	80
	1981-1980	11	Divisions	8779
	2002-2001	58	Divisions	165511
Vocational Training Centre	1976-1972	2	10	137
	1982-1980	12	101	1289
	2002-2001	14	165	1937
Secondary Vocational Institutes	2002-2001	17	183	2779
Special Education Institutes	2002-2001	47	202	4132
Illiteracy Obliteration and	1973-1972	5	47	1400
Female Elders Education	1981-1980	1294	3851	54366
	2002-2001	2361	8027	73299
Female elders in Preparatory education	2002-2001	33	73	1541

Source, Al-Hamed, 2007 p 47

Preparatory Education in Saudi Arabia:

The preparatory stage is located between the primary stage and the secondary stage on Saudi educational ladder. Students attend the preparatory stage after successfully completing the primary stage. The Ministry of Knowledge (1998) stated that preparatory education was combined with secondary education until a decision was issued in 1951 to

separate the Preparatory stage from the secondary stage. The decision also moderated the courses and curriculum of preparatory education to better fit the characteristics of the stage. Al-Huqail (1995) stated that the practical separation of secondary education, however, did not really occur until 1958 when a separate certificate was designed for each stage.

The study period at Preparatory stage lasts for three years. Students who successfully complete it are able to enrol at public secondary or vocational education (Musleh, 1981). Al-Metwalli (2007) stated that preparatory education is an opportunity for students to achieve a deeper association to with their culture of origin. Also this stage provides better opportunities to develop students' abilities and readiness for further education.

The Goals of the preparatory stage.

According to Al-Huqail (1995) the Education Policy document introduced a set of achievable goals from the preparatory stage of education, including:

-The preparatory stage is a general cultural stage which aims at educating youth according to comprehensive Islamic education for his tenet, mind, body and conduct.

-Fostering the Islamic tenet in the student's spirit and make it the control over their behaviour and actions.

-Providing the student with the experiences and knowledge that suit their age, so as to be able to learn the basic principles of culture and sciences.

-Developing the student's intellectual abilities and skills and providing them with guidance and discipline.

-Teaching the student of Islamic social life, and training them in the spirit of loving and serving their society and nation, and enhancing the spirit of faith to the homeland.

-Preparing the student at this stage for other education stages.

-Motivating the student to search for knowledge and encouraging them to use scientific methods of thinking.

-To make the student familiar with the benefit of investing their free time in beneficial works.

Both Al-Aqeeli (2005) and Metwalli (2007) illustrated that these goals are consistent with the characteristics of the students' growth (both male and female students) in and around the age of adolescence, particularly via providing the student with values, and emphasising the mental, social, moral, and psychological sides of their growth.

Development of the preparatory stage:

Given the two independent supervising entities for girls' and the boys' education, the quantitative development of type will be dealt with separately.

Development of boys at the preparatory education:

The preparatory stage began in 1958 with 173 teachers employed by 20 schools dealing with a total of 2015 students. The development of boy preparatory schools shows in Table 5. The table illustrated the quantitative development of the preparatory stage at boys' schools from the year 1958-1959 till 2005-2006.

Table 5

The Development of Boys' Preparatory Stage

Academic year	Schools	Students	Teachers
1959-1958	20	2515	173
1969-1968	300	51234	2796
1978-1977	937	149305	10302
1988-1987	1635	258341	18978
1998-1997	3068	537635	40346
2006-2005	3844	584547	52302

Source: Al-Aqeel, 2005; Metwalli, 2007

Examining this table, there is clearly a continuous increase in the number of schools, students and teachers at the preparatory stage. These figures have doubled many times in less than 50 years. This came a as a result of the extensive educational growth the country experienced during that period.

Development of girls' preparatory education:

The beginning of girls' preparatory education in the Kingdom was in 1964 (Al-Hamed, 2007). The General Directorate for Girls' Education (1992) mentioned that this stage aims at providing girls with comprehensive Islamic education for their tenet and conduct. Girls are expected to receive the skills, knowledge and relevant experiences that suit their intellectual and physical capacities. The study period at this stage, as for boys, is three years. Table 6 illustrates the qualitative development of girls' preparatory schools in the Kingdom of Saudi Arabia.

Table 6

The Development of Girls' Preparatory Stage

Academic year	Schools	Female students	Female Teachers
1964-1963	5	235	-
1974-1973	85	28303	1296
1984-1983	677	113194	9210
1994-1993	1720	321137	33854
2006-2005	3452	515803	54058

Source: Al-Aqeel, 2005, Metwalli, 2007.

The table clearly indicates the continuous increase in the number of girls' preparatory schools and the number of teaching staff, despite the longer history of boys' education. We can see very close figures as per the quantitative development between the two, whether in the number of schools or the number of male and female students along

with a natural increase in the number of male and female teachers to accommodate the increase in students' numbers during this period. The number of teachers in 2005-2006 jumped to 106360 male and female teachers at both girls and boys schools.

Styles of Preparatory Education in Saudi Arabia:

When we look at preparatory education in the Kingdom at Saudi Arabia we can find this education includes three principal styles:

Public preparatory schools.

This the most common type for both boys' and girls' education. It forms approximately 95% of the total number of girls' preparatory schools and 94% of the boys' preparatory schools. Study in this style focuses on basic knowledge, Islamic studies, Arabic language, social sciences, mathematics and English language studies (Al-Aqeel, 2005). According to Abd Al-Jawad (2005) although the study plans for the girls' and boys' schools in the above mentioned subjects are largely the same, there are some differences for example while the girls participate women's education courses, boys participate physical education courses and so on. Abd Al-Jawad adds that there is a commitment to teach public preparatory students the essential subjects to prepare them well intellectually, religiously and psychologically in a balanced way, so as to be able to help themselves and their society as well as to have a better understanding of their life affairs. Table 7 shows the study plan for public preparatory schools.

Table 7

General Study Plan for the Three Types of Preparatory Schools

Subject	Areas	Preparatory schools styles								
		Public			Holy Quran			Scientific Ins		
	Grade	7	8	9	7	8	9	7	8	9
Islamic Science	Quran	1	1	1	10	10	10	3	3	3
	Hadith	1	1	1	1	1	1	2	2	2
	Tafseer (Interpretation)	2	2	2	2	2	2	2	2	2
	Theology	2	2	2	2	2	2	2	2	2
	Fiqh (jurisprudence)	2	2	2	1	1	1	3	3	3
	Tajwed	0	0	0	1	1	1	0	0	0
Sub-total		8	8	8	17	17	17	12	12	12
Arabic Language	Arabic Grammar	2	2	2	2	2	2	4	4	4
	Literature	1	1	1	1	1	1	2	2	2
	Reading	1	1	1	1	1	1	1	1	1
	Self-Expression	1	1	1	0	0	0	1	1	1
	Dictation	1	1	1	1	1	1	2	1	1
	Hand Writing	0	0	0	0	0	0	0	1	1
Sub-total		6	6	6	5	5	5	10	10	10
Social sciences	History	2	2	2	1	1	1	2	2	2
	geography	2	2	2	1	1	1	2	2	2
Sub-total		4	4	4	2	2	2	4	4	4
General sciences	Health sciences	4	4	4	2	2	2	0	0	0
	Maths	4	4	4	3	3	3	2	2	2
	English language	4	4	4	3	3	3	2	2	2
	Artistical Education	2	2	2	1	1	1	0	0	0
	Activities	1	1	1	1	1	1	0	0	0
	National Education	1	1	1	1	1	1	0	0	0
Sub-total		16	16	16	11	11	11	4	4	4
Total		34	34	34	35	35	35	30	30	30

Source: Metwalli, 2008, Figures refer to the number of weekly lessons (hours).

Holy Quran preparatory school.

This style of preparatory education focuses on Holy Quran studies (Abd Al-Jawad, 2005).The first preparatory school for the Holy Quran known as the first school of the Holy Quran memorization was boys only and opened in Riyadh in 1963 (Al Aqeel, 2005).These schools are parallel to other schools. Metwalli (2008) mentioned in the year when the Holy Quran memorization was opened, a regulation was put in place for these schools for all of the three stages: primary, preparatory and secondary. These regulations

outline the goals of this style of school. The goals include: (a) respecting the Holy Book by conserving and maintaining it, and learning the sciences included in it, so as to achieve the goals outlined by policies concerning this field; (b) to give youth an Islamic education which allow them to develop morally, socially and intellectually in the light of the Islamic tenet; (c) to provide youth with necessary science, literature, arts and scientific training in order to be good citizens as well as to believe in God, understand their duties and right and be proud of their Islam; (d) to prepare the student for life in general, provide them with scientific skills, and prepare them to continue their further studies at later stages. Students who have successfully completed the primary education and memorized the Holy Quran sections for that stage, and students who graduated from the Holy Quran primary schools, are qualified to be enrolled in the Holy Quran preparatory schools.

The Holy Quran preparatory schools' interests include an education in Islamic sciences, Arabic language and social sciences. The Islamic science subject represents 48.6% of the study plan, the Arabic language 14.3 %, and the social sciences 6.3% (Metwalli, 2008).Table 7 shows the study plan of these styles of schools. Metwalli (2008) also said that some inclusions and omissions have been made to the general curriculum of the preparatory stage so to that this curriculum is in line with the education programs and plans at the Holy Quran schools.

The Ministry of Knowledge (1994) mentioned that the preparatory school for the Holy Quran preparatory schools up till 1980 contributed to the qualification of few teachers to teach religious sciences at the elementary stage. Afterward, their role was limited to providing a general preparatory education for male and female students, with great care for Holy Quran sciences. Students who finish the preparatory stage at the Holy Quran education's schools, have many options, including attending the general secondary

education's programs, the commercial or the vocational programs, in addition to joining the secondary schools for the Holy Quran education (Metwalli, 2008).

The number of Holy Quran's schools increased in a limited way over the years, (see Table 8). According to Al-Aqeel (2005) this style of education has been widely accepted in Saudi Arabian society, causing the Ministry of Education to increase the number of schools in the country

Table 8

The Development of the Holy Quran's Preparatory Schools

School	Schools		Class		Students			Increase
year	Male	female	Male	female	Male	female	Total	percentag
1970	2	-	4	-	39	-	39	-
1975	4	-	10	-	150	-	150	284
1980	9	-	26	-	391	-	391	160
1985	37	-	130	-	2518	-	2518	617
1990	62	16	250	51	5270	952	6222	147
1995	106	52	448	175	8630	3305	11935	92
2007	247	1069	1069	1003	20401	21229	41630	286

Source: Metwalli (2008)

Preparatory scientific institutions

The third style of preparatory education is preparatory scientific institutions. The aim of establishing the preparatory scientific institutions at Imam Muhammad Ben Saud Islamic University in Saudi Arabia and abroad was to support the Islamic culture maintain the Islamic heritage, and to implement the teaching of Islamic science and the Arabic language sciences (Imam Muhammad Ben Saud Islamic university, 1991). Metwalli (2007) indicated that Education Policy Document issued by the Higher Committee for the Education Policy in 1970, devoted section one of the fifth chapter to discussing the goals of the scientific institutions, which included the following: (a) the scientific institutions move in line with the country's educational renaissance and follow the public education study subjects giving special focus to the Arabic language and Islamic studies; (b) this kind of education qualifies the students to further studies in fields of Islamic sciences

(Share'a) and the Arabic language branches, in addition to studies at the theoretical colleges; (c) this education provides the students with an education which is scientific and directs them morally in order to achieve its basic purposes to meet the country's need of specialists in the Islamic Sharee'a and the Arabic language sciences.

The Ministry of Knowledge (1999a) mentioned when the scientific institutions were established, they were in the form at two study stages, the primary stage of two study years for preparation. After this period, the student graduates and goes on to attend the secondary education. This system was modified so that the scientific institutions changed to three years at the preparatory stage. Metwalli (2008) states that the preparatory scientific institutions had notable growth when the number raised from 38 institutions with 5441 students in 1974 to 62 institutions 10007 students in 2007. Table 9 shows the quantitative development of the scientific preparatory institutions:

Table 9

The Development of Preparatory Scientific Institutions

Scholastic year	Number of the preparatory scientific institutions	Number of classes	Number of students	Percentage of increase
1974	38	189	5441	-
1980	50	464	11422	109.9
1985	57	441	13997	22.5
1990	54	442	12399	-11.4
1995	60	466	14910	20.3
2007	62	410	10007	329

Source: Metwalli, 2008, p 209

The preparatory stage's curriculum at the scientific institutions focuses on Islamic education and the Arabic language, with the Islamic education taking up 40 % of the study plan, the Arabic language taking up 33.3 % and the social sciences taking up 13.3 %. Both mathematics and the English language share only 6.6 % of the study plan (Al-Aqeel, 2005). Table 7 shows the study plan at the preparatory stage at the scientific institutions.

Assessment Methods of the Preparatory Stage:

Since the two-semester testing system came into use, it was applied to the preparatory stage, like other education stages. The student at the preparatory stage moves from one grade to the grade that follows after passing the tests of both semesters in each grade. When successfully completed, the student is qualified to attend one of the public secondary education or vocational schools (Metwalli, 2007).

Teacher's Preparation in Saudi Arabia:

Prior to the evolution of modern education in the Kingdom, there were no specific institutions for teachers' education. Ibrahim (1985) described an Al-Kutab teacher as someone who manages the educational process in a spontaneous way having qualification or competency in the education profession except in the area of memorization of the Holy Quran sections and Prophetic Hadeeth. The Al-Kutab's main function was to provide this kind of education, in addition to the principles of writing, reading and mathematics.

We can identify that the historical development of teachers' education in the kingdom as having gone through two basic stages:

Stage of necessity (No-Other-Choice Stage).

At this stage, according to Al-Gamedi (2005) the urgent need for teachers had pushed the Directorate of Knowledge to rely on anyone with reading and writing skills who wished to teach at the primary stage, provided that they are citizens of residents in the Kingdom. Then the Directorate of Knowledge began to plan a methodology to educate teachers. Ziadeh (2007) mentioned that the start was with the establishment of the preparatory institutions, including the Saudi Scientific Institute in 1926, which was the first institution to qualify teachers in Saudi Arabia. This institute accepted those who successfully completed the primary education stage. The study period was four years, and then increased to five years in 1945. Al-Gamedi (2005) stated the study in the Saudi

Scientific Institute was divided in to two levels: the first level consisting of three years. By completing this level, the student would receive a (primary) teaching competency certificate, while the second level consisted of two years, the fourth and the fifth. By completing the second level, the student would be granted the secondary teaching certificate, qualifying the student for higher education. In 1944, the Directorate of Knowledge further established theDar Al-Tawheed School in Al-Ta'ef with a study period of six years. Graduates students of this school are qualified to teach the religious sciences (Ziadeh, 2007).

In 1952 the Directorate of Knowledge established the teachers' preparatory institutes, which were considered as an extension and development from the Saudi Scientific Institute. These had a study period of three years following the primary stage (Metwalli, 2008). Many critiques were made of these these institutes because of the insufficient academic study time students spent to master the teaching process. Adding to that, younger age graduates were unable to address the problems encountered by the primary school students, which require teachers with emotional and intellectual maturity. Those institutes were terminated after they performed their assigned significant task in critical circumstances (Ziadeh, 2007).

Female teachers' education was performed with largely the same methodology as male teachers' education. Metwalli (2008) noted that the General Directorate for Girls' Education paid more attention to the Saudi female teacher. As a result, it opened the preparatory institutes for the female teachers when it first took over its supervision over girls' education in 1960, putting in place a study period of three years after the primary stage. Al-Gamedi (2005) indicated that a study plan and curriculum were put in place for these institutes in accordance with the preparatory stage plan, except for replacing English

language with subjects such as educational sciences, teaching methods and scientific education.

According to Metwalli (2008), these institutes have encountered severe critiques because of the graduates' poor professional level. The General Directorate for Girls' Education worked to develop these institutes and extend the study period to five years instead of three years to ensure female teaching graduates would have a competency level above that level of general secondary stage graduates. Metwalli adds that the work on the curriculum development for female teachers' education started in 1968, so the institutes were to become known as the advanced institutes for female teachers.

Stage of quality.

We can call the second stage of teacher's education the stage of quality or stage of care. At this stage, the relevant education authorities attempted to address and fix the problems encountered in teachers' education at the first stage, and worked towards qualifying specialized teachers. The Ministry of Knowledge (currently the Ministry of Education) supervised a number of teachers' education institutions, while the General Directorate for Girls' Education took the responsibility for getting female teachers' qualified. In addition, some colleges linked with universities, and then with higher education at a later stage. These institutions included:

Teachers' secondary institutes.

According to Al-Gamedi (2005) the teachers' preparatory institutes were replaced by the teachers' secondary institutes. The first institute of this kind was opened in 1965. The study requirements at these institutes were as follows: (a) the student's age must not be less than 15 years; (b) the student must be qualified with the preparatory stage certificate (Metwalli, 2008). These institutes were closed after they had achieved the goals set for them, with the last institute closing in 1990 (Al-Gamedi, 2005).

Sport education institutes for the male teachers.

In the light of the need for specialized teachers in some fields, the Ministry of Knowledge established sport education institutes in 1965. Students with a preparatory education certificate could enrol in these institutes for a three-year study period (Al-Gamedi, 2005). Ibrahim (1985) stated that the sport education institute prepares and qualifies students to teach physical education at the primary and the preparatory stage. In 1992 these institutes were replaced by the Preparatory Faculty for Sport Education (Al-Gamedi, 2005).

Teachers Institutes for art education.

The Teachers Institute for Art Education was established in 1966 by the Ministry of Knowledge. This institute accepts students who have a preparatory certificate to study for a period of three years. Following this, student would receive a diploma of art education giving them the qualification them to teach art education at the primary and the preparatory stages (Al-Gamedi, 2005). Metwalli (2008) stated that the study plan for this institute have a variety of practical and theoretical fields covered approx 60% of the weekly plan of the institute, whilst time allocated for vocational and cultural education was equal at 20% for each. According to the Ministry of Knowledge (1994) these institutes were closed in 1991 in light of the Ministry's trend to raise the primary stage teachers' competency.

Art institute's for female teachers, were established under the supervision of the General Directorate for Girls' Education in 1966 to achieve two goals: firstly, to provide girls with specific skills and experiences in life affairs; and secondly, to quality Saudi female teachers specialized in female art fields to work in primary schools (Al-Gamedi, 2005). The number of these institutes was increased to four in 1970, all of which accepted female students who had completed the primary stage. The study period was three years.

In addition to the theoretical materials, students studied practical subjects in technical education, women's affairs, cooking, house management, child care, and some home-based industries. These institutes, however, were closed in 1973 (Metwalli 2008).

Secondary institutes for female teachers.

These institutes were considered as an extension of the preparatory institutes for female teachers and the general preparatory schools for girls, with several essential modifications made to the curriculum. The female graduates of preparatory teaching institutes and advanced teaching institutes, as well as graduate students of the general opportunity schools were all entitled to join the secondary institutes for female teachers (Al-Asem, 1993). Al-Gamedi (2005) identified the goal of the secondary institutes for the female teachers to qualify primary stage female teachers religiously and culturally.

Preparatory colleges for the male students.

The preparatory colleges for male teachers were established to qualify and raise the level of teachers' education for the primary stage. In 1974 a decision was made by the cabinet of ministers to establish the preparatory colleges according to scientific and educational principles that meet the need of the primary education sector and reach a status of self sufficiency for teachers at this stage (Ziadeh, 2007). To join these colleges, students must have acquired the general secondary or equivalent certificate. The study period ranges from four to five academic terms (Al-Gamedi, 2005). Metwalli (2008) mentioned that study at the preparatory colleges follows the credit hours system, and is divided into two study terms, each of which lasting 17 hours. The student is required to complete 75 credit hours to be granted the preparatory college diploma, which is supervised by the Ministry of Knowledge (Ministry of Education).

Preparatory colleges for female.

In 1978 as part of its constant effort to develop teachers' education, the General Directorate for Girls' Education established four preparatory colleges to qualify female teachers in the Kingdom state wide. The number of colleges was then increased to seven in 1979, and then to become 21 in 2006 accommodating a total of 49929 female students (Metwalli, 2008). Al-Gamedi (2005) mentioned that the aim of establishing such colleges is to prepare and qualify primary and preparatory stage female teachers. Female students with general secondary certificates were able to join these preparatory colleges, which followed the term-based system in which the academic year is divided into two terms with a total study period of two years. Female students graduate with a Diploma (Metwalli, 2008).

Teachers' faculties.

In 1989, the Ministry of Knowledge adapted study guidelines by which a Bachelor degree was available in primary education commencing in the 1989-1990 academic year. Teachers' faculties were considered as the ideal educational institutions to qualify primary school teachers in Saudi Arabia (Metwalli, 2008). Al-Gamidi (2005) noted that the number of teachers' faculties reached 18 in different regions of Saudi Arabia. These colleges attracted large numbers of students with the number reaching 25429 students in 2000. Al-Aqeel (2005) stated this number represents approximately 13.25% of the total number of students studying at higher education faculties.

The Ministry of Higher Education began the supervision of teachers' faculties in 2007-2008, so that each faculty was included in the nearest university, and then included in the education faculties. Teachers' faculties in fact, became the nucleus to some newer universities established in the kingdom's regions (Metwalli, 2008).

Arabic Teachers' Preparation:

Generally, Arabic language teachers working in Saudi Arabian schools are graduates from the faculties of education or faculties of letters who have specialised in the Arabic language (Ministry of Education, 2007). According to Al-Shafei (2000) graduates of faculties of education differ from their counterparts who have graduated from the faculties of letters in terms of receiving the educational preparation and the practical skills prior to formally practicing education.

Students at educational faculties study specialised courses in Arabic language as well as educational, vocational and cultural courses. These are integrated and coordinated courses, focusing on making students less conscious of the difference between specialized academic study and the educational study. The student will be then granted the Bachelor's degree in education allowing him to teach the Arabic language in the public education schools (Ministry of Education, 2005).

The Arabic Language Teachers' Preparation Goal:

Because of the significance of the Arabic language teacher's role in Saudi Arabia, there are an important set of goals developed in the hope potential teachers can achieve them during their educational process. According to Lutfi (1992) these goals include: (1) the teacher should become able to determine short-term as well long-term goals in the teaching of Aribic. He should also understand the basics of the field of study in which he has specialized, regarding the goals, content, and research method, and is able to employ his knowledge in achieving the general and specific goals for this field. (2) Student teacher provided by the basics of educational and psychological sciences related to the teaching process. This preparation helps them to plan how to teach the language. (3) One of the most important things to consider when educating Arabic language teachers is providing them with knowledge about reading: its nature, types, experiences and the domain of

research and results, so he will be confident about the feasibility of his teaching methods. (4) The teacher should know the children's linguistic capabilities when he comes to teach them and how they may benefit from his teaching. (5) Providing the teacher with all teaching reading methods so as to have an awareness of all the features and benefits of each method to avoid any disadvantages while implementing a given method. (6) Teaching him, the most important social and physiological aspects that affect reading process. (7) Teaching student teachers how to use the library and how to direct their students so as they can benefit from it. (8) The teachers should master the reading evaluation process by learning the skills evaluating thoroughly, such as fluency, understanding, use of the dictionary, explaining a word's meaning along with the linguistic skills the student may have acquired.

According to Al-Shafei (2000) the process of educating the Arabic language teacher aims to train him to look at the Arabic language branches as integrated parts of a whole. To be trained on one branch does not necessarily mean that one is trained on all parts. Ashafei also indicated that training the teacher in the use of linguistic games and items such as training cards are critical in making students more interested and involved in learning the Arabic language. Training and educating the teacher also aims at training him in the relevant student activities such as school radio, journalism, linguistic clubs and drama. In addition, Abd Al-Hameed (2009) noted that a further aim of educating the Arabic language teacher is to train him to connect school-based linguistic activities with those happening in wider society and its literature. In the Arabic language, new teaching methods often appear that resolve some problems that both teacher and the student encounter. These may also help the teacher to make decisions on some issues of conflict, apply modifications to some methods and clarify incorrect mean of implementing those methods. It is important to train the teacher to use these methods and to discard inefficient

or feasible methods, as well as to provide the teacher with opportunities apply more methods while teaching Arabic.

Arabic Language Teacher's Role:

The reasons behind the importance of the Arabic language teacher's role, according to Lutfi (1992), are: (a) He is the first and most significant figure in teaching the Arabic language in schools, even though other subject teachers are responsible for ensuring that sound Arabic language is used by their student in their writing and reading tasks; (b) When teaching the Arabic language, the teacher is under the pressure to fulfil a vital and critical role, not only because of his commitment to use standard language in his speech, his teaching and the selection of appropriate phrases, but also to make sure his students appreciate literature and linguistic conventions. He is also required to direct their readings and connect them with their literary heritage; (c) He is teaching the mother language, which forms the foundation of Arabic nationality, preserves distinguished components and characteristics of the Arab Nation, and helps form its personality; (d) The Arabic he is teaching is sufficiently coherent and connected with the Islamic tenet, since Arabic is the language of the Holy Quran, and one of fundamentals of Islam's.

According to Fadl-Allah (1999) the Arabic teacher is often responsible for teaching religious education in addition to Arabic language in many Arabic nations. Fathalallh also said, the Arabic language teacher imparts the spiritual and national Arabic culture and he is responsible for establishing the pillars of the Arabic nationality.

Teaching reading at the preparatory stage:

Since Arabic is the official language of Saudi Arabia, it occupies a special position in Saudi education. Al-Shallal, Al-omar and Al-Salamah (2000) highlighted the Arabic language as being the language of the Holy Quran's and a tool for preserving Islamic and Arabic heritage. It is also considered as one of the most critical means for schools to

achieve their many functions. It is also the most important means for communication and understanding between the learners and his environment, and forms the basis of all aspects of education. Furthermore, it is the basis of all education activities performed at school, whether through listening, speaking, reading or writing.

The Arabic Language Department at the Ministry of Education (2003) set the goals for reading subjects at the preparatory stage as follows:

1- To develop the student's ability to read the Holy Quran and the honourable Hadeeth and appreciate their eloquent norms.
2- To enable the student to appreciate reading aloud, in order for them to read both poetry and prose aloud in a competent manner.
3- To help students correctly read texts without diacritics.
4- To develop student’s skills in following spoken language, and to enable them to understand and analyse it.
5- To develop student’s silent reading skills on a range of different types of text.
6- To develop student’s skills in understanding, analysing and evaluating the text.
7- To encourage students to identify the quality of the different expressive art styles.
8- To encourage students to identify some writers and their literary work.
9- To encourage students to use dictionaries, encyclopaedias and different sources literature.
10- To encourage students to be acquainted with a suitable amount of Arabic Islamic intellects.
11- To develop students’ acquisition of vocabulary and linguistic compositions.
12- To develop students’ literary gifts.

Typical Reading Lesson in Saudi Preparatory Schools

Teaching reading at the preparatory stage differs from teaching it at a previous stage. Al-Smaili (2002) mentioned that the educational stance at this stage should be positive rather than negative. Handling the situation should be based on the teacher's assumptions about what the students have acquired during previous stages. Al-Smaili said,these assumptions are based on the fact the students should have: (a) knowledge about punctuation in text and the ability to follow these signs in reading; (b) the ability to read fluently along with understanding and comprehension; (c) the ability read aloud (voice clarity, quality of performance, alphabetic pronunciation and good control); (d) the ability to read eloquently; (e) the ability to identify vocabulary meanings contextually; (f) the ability to orally answer questions with sound Arabic language; (g) the ability to ask relevant questions when required; and (h) the ability to summarize main ideas whether written or oral. Based on preparatory teachers' knowledge on the curriculum and stage goals, they believe students at this stage achieve most of the previous skills (Al-Smaili, 2002).

Experts in the field of teaching Arabic reading (e.g., Al-Dlaimi & Al-Waeli, 2003, Shehateh, 1986) all agree that reading lessons at the preparatory stage usually go through a number of stages, as explain below. The first stage is the preparation stage: According to Al-Dlaimi et al. (2003), the teacher prepares the lesson at this stage by planning one or all of the following steps. The first step is to talk about the biographical details of the author of a given text. Here the teacher's focus may be on the author's life, their main writings, and their position among other contemporary authors and writers. Alternately, the teacher may choose to talk about an event or a story related to the lesson. Story reading is considered as one of the best preparation techniques for a reading lesson, because it involves attracting the students' attention so that they can begin to look forward to reading

and exploring the dimensions of the text. It is also possible to talk about the general idea in relation to the lessons topic that is dealing with the main idea of the lesson. Some teachers may get their students involved in the preparation process by asking them some questions.

The second stage is called the teacher's typical reading. At this stage, the teacher reads the topic in a typical way, with accuracy and clarity, in a way that matches the lesson topic, considering the tone of voice and its level, and representing meaning during the reading. Applying the meaning will lead to better comprehension of the reading, and the students' readings afterwards will be more accurate (Shehateh, 1986).

During the third stage is the students read the text silently, trying to simulate the teacher's reading and understand the topics implications. This is especially required if it is the students first experience of the topic (Shehateh, 1986).

The fourth stage according to Al-Dlaimi et al. (2003) is when students read the topic aloud. Two-thirds of the lesson time should be allocated to this stage. However, the teacher should not interrupt the students reading to correct their reading mistakes, because this will reduce the value of their reading. During this stage the teacher should select students to read randomly, to ensure each student is following the text and is ready to read. Students read a paragraph or more according to the concept or length of the text. It would be more valuable if all students participated in the reading lesson.

The fifth stage covers, lessons and moral values. It is understood that in each piece of writing, the author is seeking to reach specific goals or express certain ideas. Therefore, the teacher should explain and illustrate, while the students are engaged, the lessons and values that are implied in the text. The teacher may ask questions, such as "What is the benefit of this lesson to our lives?" The teacher should also clarify that what people acquire from reading will benefit them increasing their literacy and will consequently

affect their practical lives and become part of their behaviour when implementing them in an accurate and scientific way (Al-Dlaimi et al., 2003).

The Reality of teaching and evaluate reading Saudi preparatory schools:

Many researchers have criticized the reading teaching methods and assessment used in Saudi schools. Both Musa (2001) and Yones (2001) agree that teaching reading is a constant, routine lesson wherein the teacher reads the text, before the students stand one after the other to read parts of the text before sitting down again. Each student performs the same role, reading the whole lesson. Shehateh (1997) affirmed that 75% of the teachers perform the reading lesson by highlighting the topic. They read the text aloud and have students read in alphabetical order, which is where they sit in the classroom. Then the teacher explains the vocabulary, illustrates the lesson's ideas and finishes by answering the questions set out in the book. This is the same routine of every individual lesson. Teaching reading in Saudi schools can be limited to just ensuring knowledge of the vocabulary and the pronunciation of each word without being concerned about simply teaching the reading and implementing continuous training in direct communication with the meaning (Badi, 1990).Taimah (1999) believed that teachers waste lesson time by asking students to read the text silently and that clarifying the new vocabulary is an issue that needs to be reviewed and emphasised. According to Fadl-Allah (1999), the reading lesson in its current form is useless. He points out that the ongoing teaching of reading following the current method has resulted in students being uninterested in reading, making them look upon it as an obligation. This, in turn, has generated a lack of motivation for listening, and subsequently the reading lesson has turned into an uninteresting class which learners shy away from. Yones (2001) described the characteristics of reading class as automatic, spiritless and as being unable to achieve the reading class objectives.

This raises the necessity for teachers to be more focused on the reading lesson objectives and to work towards achieving these goals and objectives, so as to help students acquire the necessary reading skills. Alaed (1998) stated that many teachers are not really aware of the reading goals and objectives, thus limiting their ability to achieve them. They consider the content of the reading lesson as merely focusing on the Arabic language components and as serving up the grammatical rules. Thus, the theory of the grammar lesson is to be practised in the reading lesson. The teacher may not go much further beyond this assumption. If this was the objective of the reading lesson, it means that teachers have lessened the value of reading, separating it from its great objectives and seriously limiting the role of reading to merely teach grammar. By doing so, teacher make reading another grammar lesson. This makes reading a dependent rather than an independent lesson. Teachers also make it a field to apply and affirm the theoretical lesson on the Arabic language. Alaed (1998) added that the absence of reading lesson goals leads the teacher to lose their status as a role model. Role modelling is important in helping students acquire skills. If the teacher masters the ability to be a great role model they will contribute to delivering strong skills to their students. On the other hand, students will find it hard to acquire skills if the teacher fails to be a good role model. Al-Atheeqi (2009) stated that when attending reading lessons, many teachers resort to interrupting students during their reading to emphasise linguistic or dictation skills. They do not pay much attention to reading skills, which an important aspects in reading teaching.

According to Shehateh (1996), not enough attention is paid to reading comprehension and analysis in the reading class at preparatory schools. Shehateh also said teachers do not go further in helping their students analyse and give opinions on what is read, or to distinguish between different types of arguments and ways of presenting them. Furthermore, he said connecting information that the students have learned from their

previous readings, in terms of problem solving, is also a concept that is rarely practised in Saudi schools.

Only text books are used in teaching reading during the reading session. This is because the number of students in the classroom does not support the use of any other reading resources (Muhammad, 2002). This is also confirmed by Al-Ajami (2004), who described the difficulty in using computers during teaching in Saudi schools due to overcrowded classes.

In his research into improving reading in public schools, Yones (2001) believed that schools must give greater attention to teaching reading at all school levels. This does not mean that the number of reading lessons should be increased in the academic timetable, certain reading exams should set, or that any other nominal forms should be develop. Instead, it is critical to give extra care and improvement to reading teaching methods, based on comprehensive change in understanding the nature of reading and its impact on the students in light of the modern directions of education and psychology.

Shehateh (1996) highlighted that text books writers should pay close attention to student desires and experiences and in order to make reading subjects enjoyable. This would then enable teachers to develop the students' skills more effectively. It would have the effect of familiarising students with reading as a means of achieving pleasure and gaining benefit from what they read (Shehateh, 1996). Fadl-Allah (1999) indicated that the modern curriculum should focus on developing the students' trends more than focussing on knowledge. Madcour (2003) affirmed the necessity of the reading curriculum in providing an opportunity for the teacher to identify students' trends toward reading and direct them positively. Al-Atheeqi (2009) stated that calls to direct attention to the students' trends, desires and experiences when teaching reading are in line with modern developments and match modern educational attitudes that concentrate on the students'

productivity and heir active role in the education process. This is consistent with what Fadl-Allah (1999) pointed out in saying that the extent of the reading curriculum's competency is measured by its ability to direct attention to the students' trends, desires and interests, and by their understanding of the written text. This means that a measure of the students' understanding is evidence of the curriculum's competency and effectiveness.

Evaluating reading in schools is closely linked with the teaching methods. It should not be limited to the students memorization of the questions that follow each lesson and answering these questions in light of the students' reading of the lesson. Al-Atheeqi (2009) commented that this reading evaluation method remains inadequate in meeting the students' needs and the requirements of the era, because this kind of evaluation concentrates on exams only to judge the students' reading capability and ignores other critical skills. As a result, the Ministry of Knowledge (1999b) has identified a number of reading skills at all the learning stages. These skills are: quality of pronunciation, understanding and comprehension, and idea inference. But Al-Atheeqi (2009) criticised the limitation of this list as it ignores some other reading skills that apply to the preparatory and secondary stages such as role-playing and analysing skills.

Summary

The Kingdom of Saudi Arabia is one of the largest countries in the Middle East. It is also the destination for Muslims people. Founded King Abdualaziz in 1902, it is bordered by Red Sea, Arabian Gulf and seven other Arab countries. Its official language is Arabic and the Islamic law forms its constitution.

Educational development in the Arab Peninsula can be divided in two stages pre-Saudi era and post-Saudi era Saudi Arabia. In the pre-Saudi era education was limited in some regions and absent in most areas (Al-Aqeel, 2005). Three types of education (Mosque, Al-Katateeb and schools) were found in this time, especially in Makkah and Al-

Madinah (Al-Gamedi, 2005; Al-Hamed, 2007). Education in Mosques and Al-Katateeb was limited to teaching Arabic language and Quran (Al-Shamekh, 1985). Furthermore, most of the teachers in this era were not qualified. Some public schools were established during the Ottoman rule and after Hussain Ben Ali's independence from the Ottoman authority (Al-Hamed, 2007; Mursi, 1988). During the pre-Saudi era some private schools were established with support of Indian community and traders in Makkah.

The second stage of development for education in Saudi Arabia started after King Abdualaziz Ben Abd Al-Rahman union of Saudi Arabia (Al-Gamedi, 2001). The establishment of the Directorate of Knowledge was the real start of modern education in Saudi Arabia. Setting goals and scientific plans for education were the first tasks of the Directorate of Knowledge (Al-Aheedab, 1978). The Directorate of Knowledge was replaced by the Ministry of Knowledge in 1953, and again in 2002 with the Ministry of Education (Al-Gamedi, 2001).

The Saudi government provided free education for citizens and residents, and the budget of the education sector reached 25% of the general state budget (Al-Hamed, 2007). As a result support the number of schools, colleges, university, teachers and students increased in relatively short time.

Teaching the Arabic language is the basis for the Saudi schools to achieve their educational objectives. Furthermore, it is the basis of all activities performed at school, whether through listening, speaking, reading or writing (Al-Shallal, Al-omar & Al-Salamah, 2000). The Arabic language department at the Ministry of Education is responsible for setting targets and plans for reading matter. This chapter also presented the typical reading lesson in Saudi preparatory schools. While some reading researchers said, teachers used traditional and routine method to teach reading in Saudi schools (Musal, 2001; Yones, 2001; Badi, 1990 &.Taimeh, 1999).

The next chapter is the pilot study. It discussed the psychometric qualities of all Arabic language versions of measures to be used in the study.

Chapter 4: Pilot Study

Introduction

A pilot study was undertaken to evaluate the psychometric qualities of all Arabic language versions of measures to be used in the study. Kumar (2005) stated that researchers usually conduct a pilot study if they have insufficient information about the area of study or to investigate the possibility of conducting a more comprehensive study. Content (2007) indicated that piloting instruments is a fundamental procedure in research and pilot testing should be conducted with corresponding samples.

Definition of a Pilot Study

A large set of definitions exist that provide valuable descriptions of pilot study protocols in the fields of education and psychology (e.g., Altman et al., 2006). Wiersma (1995) defined a pilot study as:

> "A study conducted prior to the major research study that in some way is a small-scale model of the major study: conducted for the purpose of gaining additional information by which the major study can be improved-for example, an exploratory use of the measurement with a small group for the purpose of refining the instrument" (p.468).

According to Haralambos and Holborn (2000) a pilot study is a small scale 'preliminary-study' of the fuller study being undertaken by the researcher. A small scale survey is undertaken in advance of a major investigation in order to devise formal steps for the full scale study project. The scale of a pilot study varies depending upon the context and topic of the study. In some cases, some observation is carried out by the researcher at pre-designated locations in order to study the behaviour of students in the classroom or people who may be passing through the area. Accordingly, the researcher devises a questionnaire beforehand and then conducts a pre-study to seek the responses of a small

number of respondents. Forgasz and Kaur (1997) illustrated that a pilot study usually precedes the main study and is an important part of the research design. After correlating pilot study responses, the researcher decides to administer the questionnaire to the entire sample or make appropriate amendments to the questionnaire before the final administration of the measure.

Importance of the Pilot Study

A pilot study usually tests the design of the main study. Underlining the importance of pilot studies in a full-scale study, Gay (1981) considered a pilot study as the formal evaluation tool for research design as it evaluates every part of the research plan. De Vaus (1993) was emphatic when he said "Do not take the risk. Pilot study test first" (p.54).

Administering questionnaires to collect data is one of the most reliable forms of gathering information for research (Jonassen, Tessmer & Hannum 1999). However, if the nature of the study happens to be a strategic one, there are far reaching consequences based on the success or failure of gaining valuable data. All efforts should be made to make sure that the questionnaire is well designed. In order to remove all blemishes from a questionnaire, piloting the questionnaire is considered the safest method. Gorard (2001) recommended two stages to piloting a questionnaire. First, present the questionnaire to experts, friends, family and anyone else. Discuss the questionnaire with them and ask for comments and criticisms. Second, analyse responses with the design of the main study in mind. In administering the pilot study, it is important to ensure that a number of conditions are met. Gorard also said, similar people should be chosen for the pilot study as will be required in the final study. According to Cohen, Manion and Morrison (2000) researchers have to be sure the sample represents the population target. Lodico, Spaulding and Voegtle (2006) suggested that the sample selected to complete the questionnaire are also asked to give their remarks about the questionnaire. Second, a similar procedure is adopted in

administering the questionnaire to that which is planned to be used for the final study. Gorard (2001) described the good effective pilot study as one which selects the sample, negotiates access, delivers instruments, calculates responses and analyses the results using the same design as the main study. Third, timely feedback is sought from the participants of the pilot study. Fourth, if it is found that some questions are producing irrelevant responses, then such questions must be removed from the final study or the questions are appropriately modified. Fifth, if participants feel that some questions are ambiguous or offensive in any way, then such questions must be removed or rewritten.

The idea of a pilot study is to process the measurements. The pilot study forms an important ally in carrying out the research, which in turn helps in finding an innovative solution to many issues. Many reasons drive the researcher to do a pilot study. Peat, Mellis, Williams and Xuan (2002) suggested that several critical procedures need to be adopted to improve the measures' validity. These procedures involve applying the measurements within a pilot study sample similar to that of the main study, identifying any difficult words which are used in the measures, deletion of unnecessary questions, ensuring questions have adequate length, evaluating administration techniques for effectiveness, and assessing the time taken to respond to measures.

In order that accurate and reflective data is collected, a pilot study forms an important part of the preliminary study. While carrying out a study concerning ethical and legal aspects of the nursing profession, Nyatanga (2005) stated that a pilot study has value in different ways if it is used as a part of a research plan; for example, to improve the internal validity of a questionnaire or the scale, or assessing the feasibility of the main study.

Benefits of a Pilot Study

While undertaking education studies, every effort should be made to make sure that all proposed steps are taken to collect the data. Thus it helps to pre-test the study, simplify procedures and reduce the chance of making mistakes during the research process. Conducting a pilot study has many benefits, as such studies can save the researcher both time and money, according to Oppenheim (1992) who determined that while a pilot study costs time and money in the end, it will save money and time. Some major benefits of pilot studies have been cited by many experts in educational research (e.g., Oppenheim, 1992, Verma and Mallick. 1999, Lanphear, 2001). First, the researcher can develop ideas approaches and clues after performing the pilot study. Second, the research process is purged of imperfections or errors to a great extent, as the researcher discovers such errors during the pilot study. Third, the researcher gets valuable feedback from concerned parties, which provides additional inputs to the researcher assisting with further refinement of questionnaires and surveys. Fourth, the design, format and analysis of the actual research process can be made more contemporary with the help of feedback. Fifth, researchers also get ideas about the most suitable method with which to collect data from the sample research population. For example, if it is found during pilot studies that the majority of respondents are not coming out with detailed answers to the subjective questions then, based on the responses, the researcher can reframe the questions in a more objective format. Finally, in case respondents seek further clarification on the subject or questions, the researcher can modify the question, incorporating clarification as well. This will save a lot of effort on the part of the researcher.

The Pilot Study in Education

No one can ignore the fast growth happening in the world economy, health, technology and media. To support all these fields with employees and experts, education

has a difficult task. An increasing number of studies are investigating educational processes and pilot studies are considered as appropriate in educational research to examine the expediency and effectiveness of new teaching strategies and new material in education. Furthermore, pilot studies can be used to assess new solutions for obstacles which face teachers or students during their education journey. The *Higher Education Research Centre in Saudi Arabia (n.d.),* has conducted pilot studies for establishing educational systems, like community colleges, and for studying issues of education's societal impact, including the effect of university admission processes and capacities.

The Plan of the Pilot Study

A pilot study in studies such as the one documented in this thesis involves three stages of data collection. In the first stage, the researcher selects schools and invites them to participate in the pilot study. The second stage involves providing copies of information to participants, including documentation and consent forms for guardians and teachers. In the third stage, the researcher completes data collection in the schools.

The Aim of the Pilot Study

The researcher conducted the pilot study in order to achieve three key objectives. Firstly, to test the appropriateness of the instruments to be used in the main study. Secondly, to evaluate the psychometric qualities of all Arabic language versions of the measures used in the main study. The final objective was to substantiate the timing sequence for the administration of the questionnaires.

Face and Content Validity

The VARK questionnaire for younger students is available in English and the Teaching Reading Strategies Questionnaire (TRSQ) teacher and student forms were designed by the researcher in English before being translated into Arabic. Establishing the validity of the questionnaire was an important part of the previous study. According to

Hittleman and Simon (2002), validity refers to the capacity of the instrument to assess the concept it is supposed to measure. The questionnaire was developed by reviewing topics relevant to the research. Light, Singer and Willet (1990) stated that one way to measure the validity is "by having experts examine the measure and agree that it does assess what it is supposed to assess. The measure looks right, reads right, feels right" (p.152). The researcher submitted English and Arabic language copies of the questionnaire to three Saudi Arabian postgraduate students studying at Australian universities, two of them of them majoring in linguistics at La Trobe University and a third majoring in curriculum and instruction at Griffith University to assess translation quality and questionnaire comprehensibility. Additionally, twenty Arabic language teachers formed the sample for the pilot study. These participants responded to the TRSQ teacher form and were asked to complete a set of review questions on an attached form. They answered the following six questions: was the aim of the questionnaire clear?; were you able to understand the questionnaire?; was there any ambiguity in the questionnaire?; in your opinion does the questionnaire adequately examine the following subscale: (a) reading instruction (b) reading resources (c) reading activities (d) development of reading comprehension skills or strategies and (e) assessment; were you able to respond effectively on the rating scales as presented?; and finally an open-ended question such as please provide any other comments about this questionnaire. Comments and suggested modifications provided by the respondents' were analysed and are summarised in (Appendix A). Elements of this feedback were used to modify the teacher's form of the questionnaire.

Following completion of the TRSQ and VARK students were asked to comment on the clarity of the questionnaire's items and the adequacy of the time required to complete the questionnaires. The students' feedback was taken into consideration and the questionnaires were modified accordingly.

Method

Sample

This study was confined to a sample of participants from Jeddah preparatory schools. The target group for the pilot study was 155 students from grade 7 and 8. Table 10 shows the student sample used in the pilot study.

Table 10

Characteristics of *Schools and Students in the Pilot Study*

School Name	Gender	Measures Completed		Grade		Total
		VARK	TRSQ	7	8	
Al-Buhtory	Boy	Yes	Yes	20	20	40
Thirty Six	Girl	Yes	Yes	24	0	24
Ninety Nine	Girl	Yes	Yes	0	21	21
Gurtuba	Boy	No	Yes	0	35	35
Prince Sultan	Boy	No	Yes	0	35	35
Total				44	111	155

Fifty teachers who teach Arabic language in preparatory schools in Jeddah were selected for this phase of the study. Subsequently the results of five teachers were removed from the study because of clear blemishes in their responses. The final number of teachers in the pilot study was 45. Table 11 shows the teacher sample used in the pilot study.

Table 11

Teacher numbers for Schools participating in the Pilot Study

Female schools	Teachers (n)	Male schools	Teachers (n)
Eleven	3	Al-Buhtory	3
Nineteen	1	Ebn- Gandal	3
Thirty Six	3	Prince Khaed Ben Fahad	3
Ninety Nine	3	King Fahad	6
Twenty Tow	2	Asaad Ben Al-Furat	4
Twenty Five	3	Al-Maroah	4
Fifty	2	Prince Naif	2
Fifty Four	1		
Ninety Four	2		
Total	20		25

Instrumentation

The VARK questionnaire.

The VARK is an inventory developed by Fleming in 1987, it is an assessment tool which is used to investigate student performance (French et al., 2007). Fleming (2006) describes VARK not as a test but as a guide to finding the ways that students process information. Travis (2006) describes VARK as the first systematic questionnaire which is a non-diagnostic tool designed to advise the user about individual learning style preferences. Fleming (2006) noted that some students were able to learn with poor quality teaching and some were not able to learn with good quality teaching. This information forced Fleming to look for answers for what he had observed within the school. He decided to design some multiple choice questions based on his opinion that students had

preferences for their input and output of information. Fleming (2006) proposed that the questions in VARK address generalized situations that students face in their everyday lives. The first design included 17 questions. The respondents for the questionnaire were 3000 students and 230 academic staff at Lincoln University. The designers revised the questionnaire and reduced the number of questions from 17 to 13 (Version 3). Nine of the 13 questions have four response options of Visual, Aural, Read/write and Kinaesthetic. Four questions have only three responses. These are question number 4 (visual, read/write and kinaesthetic), question number 8 (visual, aural and kinaesthetic), question 9 (aural, read/write and kinaesthetic) and question 12 (visual, aural and read/write).

According to Fleming (2006), Norborg (N.D) reviewed the VARK questionnaire in 16 schools in the Oppland region of Norway. Results indicated questions were not discriminating well and one item was creating some unusual response data. As an outcome, 12 questions were redesigned and tested by Norborg. The final version of the VARK was then published on a website in October 2006. Since the development of the first version of the VARK, alternative versions have been developed. For example, there are formats for younger people and for athletes. VARK for younger people is a self report questionnaire consisting of 16 questions, each question having four responses which represent the definitive learning style. According to Boatman et al. (2008) each question declares the experience of the respondent when they complete this version of VARK.

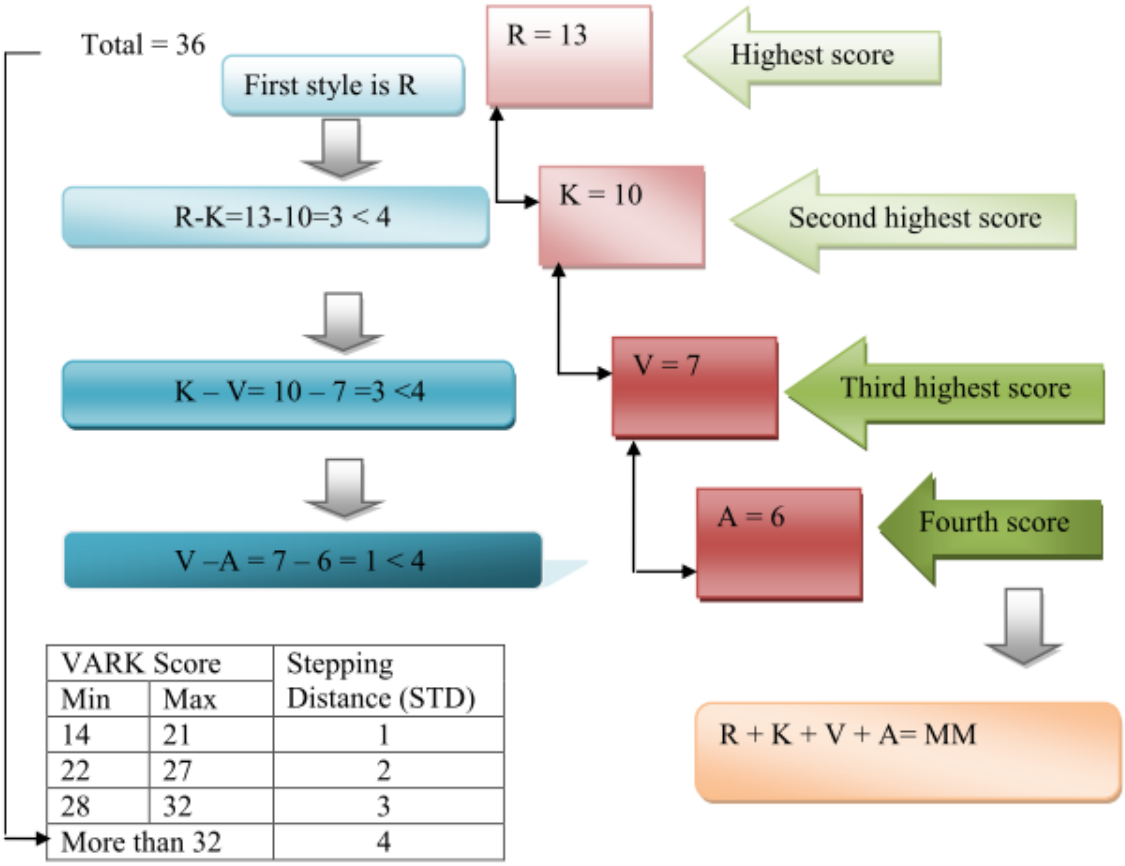
The characteristics for each style in the VARK are as follows. The visual preference indicates the style that the student uses deals with information charts, graphs, and symbolic colour words. The aural style preference involves discussion, phone calls, oral presentations, tutorials and oral feedback as the style of information students prefer to use. The read-write style involves using books, texts and journals as the information preferred by this type of student. In the kinaesthetic style, students prefer to learn through

the use of the body, or physical learning. In the VARK, users can select one or more of four responses to cater for multimodal styles.

Fleming (2006) carefully constructed the questions in VARK to give a clear indication as to how the person deals with the information. To identify the style of the student who has responded to VARK you should follow the four steps in sequence.

Figure 8 details how scores are calculated and the learning style is determined. For example, when student (X) responded to VARK his responses were (V=7), (A=6), (R=13) and (K=10). The total of scores is 7+6+13+10=36. The stepping distance (STD) is (4). The stepping distance is determined to be from one to four according to the total scores in the VARK (see Figure 8). Scores and then ordered from the highest to the lowest score (i.e., R=13, K=10, V=7, A=6). First step: the highest score represents the first preference of the student (X). R=13 in this case the first preference is Read/Write (R). Second step: subtract the second highest score from the first highest score (i.e., R-K, 13-10 =3), if that figure is larger than your stepping distance then the mean of the first highest score represents the learning preference of the respondent. If not, then take the second highest score as the second preference, in this case the second preference is the Kinaesthetic (K), and then continue to step three. Third step: subtract the third highest score from the second highest score (i.e., K-V, 10-7 = 3). If that figure is larger than your stepping distance then that means the respondent has bi-modal preferences. If not, then take the third highest score as the third preference. In this case, the third preference is Visual and then continues to the fourth step. Fourth step: subtract the fourth score from the third highset score (i.g., V-A, 7-6 = 1) if that figure is higher than the stepping distance then that means the respondent has a tri-modal preference. If not, take the fourth score as the fourth preference. In this case, the students use all four learning styles (quad learning styles).

Figure 8. VARK scoring system



VARK Score		Stepping Distance (STD)
Min	Max	
14	21	1
22	27	2
28	32	3
More than 32		4

Use of the VARK questionnaire is widespread in education. Researchers have suggested, however, that the reliability and validity of VARK needs further evaluation (e.g., Leite et al., 2009). In contrast, Becker, Kehoe and Tennent (2007) suggested that the VARK can generate accurate information about student learning preferences. Fleming (2006) has made the following statements about the reliability of VARK:

> "The questionnaire was not designed to be reliable in terms of consistency of scores over a long period of time. Instead, the questionnaire was designed to provide students with effective learning strategies to use on their learning preference (s). Over the course of a student's career it is likely that some modes will become strengthened, some will dominate and others may be underutilized, therefore it is difficult to say that a student taking this test each

year for twelve consecutive years will obtain similar scores each year. On the other hand if a test- retest occurs within a few weeks it is likely that the scores received will be similar" (p. 56).

Reynolds (2005) discussed the reliability of VARK. He suggested that time and experience will affect VARK profiles, therefore the reliability of VARK is difficult to assess because VARK provides a profile rather than a score. Travis (2006) proposed that the most important peculiarity for statistics is immutability rather than human preferences and that learning style is a human characteristic which it is accepted will change over a period of years. According to Fleming (2006) longitudinal studies for VARK are in development; however, due to the nature of VARK ,which provides a profile rather than a score, challenges exist for longitudinal studies seeking a traditional determination of reliability as it is improbable that standard reliability data on the VARK can be acquired. Leite et al. (2009) reported the reliability coefficients of VARK subscales as being .85, .82, .84, .77 for the visual, aural, read/write and kinaesthetic.

Hawk and Shah (2007) reported that VARK provides only moderate support for validity and reliability. Murphy et al. (2004) described the VARK as a quick and easy tool which gives the student a sense of self-awareness after discussion of the results with the testers. Large scale testing of the statistical validity of the VARK was undertaken in 2004 by Svinicki and her team at the University of Texas in Austin, USA. In spite of a broad range of statistical techniques, the four subscales of the VARK were not able to be confirmed. This was attributed to the possibility of more than one answer or no answer being chosen for a single item on the questionnaire (Fleming, 2006). Despite issues with the statistical validity of VARK and further testing of it still in progress, VARK has proven to have strong content validity. Travis (2006) claimed that "VARK is strong because it is not a semantic quiz: rather the responses are focused aspects of the four

modes of learning" (p. 73). Reynolds (2005) reported that the content validity of VARK was quite strong as a result of questions and answers being drawn from real life situations. Slater et al. (2007) believed the strength of VARK is that it draws on the real life of the respondents' in the questionnaire item and respondents identify with results that they receive which affirms the validity of VARK. Fleming (2006) detailed a study involving pharmacy students and reported that students chose to use strategies aligned with their VARK results. Those who had a strong read/write preference (from the VARK questionnaire) chose to use writing and reading strategies; those who were strongly aural in their preference chose to use discussion with others, and so on. The correlation between students' strategies that used and their responses on VARK presented on Table 12.

Table 12

Correlation between Students' Preferred Study Strategy and VARK Modality

	Modality preferences			
Study strategy preferences	V	A	R	K
V	.46*	.21*	.04	.27*
A	.28*	.34*	.15	.33*
R	.09	.12	.54*	.08
K	.24*	.17	-.05	.44*

*The asterisks show significance at the .001 level (Fleming, 2006; p. 57)

Reading Achievement Assessment Form (RAAF).

The Reading Achievement Assessment Form (RAAF) was designed by the researcher to assess student skills in reading. This form covers five skills in reading, the first being comprehension. Snow (2002) defined reading comprehension as "the process of simultaneously extracting and constructing meaning through instruction and involvement with written language" (p. 11). Students with this skill can understand the idea of a text when they read it. The second skill is speed reading or fluency, which means the ability to

read the text quickly with a clear understanding. The US NRP (2000) stated that fluency was an "essential ingredient in successful reading development" (section 3, p.1). Blevins (2001) identified fluency of reading as the main object for teaching reading because students who read successfully can understand the meaning of the words. The third skill promotes understanding the tense of the sentence. This means students can identify the tense of sentences in a text. Vocabulary is the fourth skill and this is measured by the number of uncommon words which students know and can use to explain the text after they have read it. Furthermore, students should understand the meaning of the vocabulary being used. Not understanding the meaning of a word in a text will affect the understanding of that text. According to Ediger (1999), vocabulary is important for students in all curriculum areas. Section 4 of the NRP (2000) described the importance of vocabulary as an essential skill in learning to read; it is the key to making the transition from oral to written form. The fifth skill is summarising which tests students' ability to represent the main idea and important points of a text, either orally or in writing. In RAAF teachers will assess student reading skills using the following standard evaluation scale: Excellent (5), V. Good (4), Good (3), Satisfactory (2) and Weak (1).

Teaching Reading Strategies Questionnaire (TRSQ) (Teacher Form).

The Teaching Reading Strategies Questionnaire (TRSQ) (Teacher Form) was selected form PIRLS 2006 designed in the English and then translated into Arabic. The teacher based questionnaire is a self-report measure developed by the International Association for the Evaluation of Educational Achievement. The first version of the questionnaire administered in the pilot study has five subscales and consists of 52 items (see Table 13) that ask teachers the instructional methods, materials, and resources used during reading class. There were also questions regarding reading class activities, classroom assessment practices, and strategies used to develop their students' reading

literacy and comprehension skills. The Arabic reading teacher of each seventh or eighth grade class in the study completed the TRSQ. Teachers respond to the items using one of the following Likert anchors: always, often, sometimes or never. This questionnaire requires approximately 30 minutes to complete.

Table 13

Number of Items for TRSQ (teacher form) Subscales

Subscales	Number of Items
Reading instruction (RI)	6
Reading resources (RR)	17
Reading activities (RA)	15
Development of reading comprehension skills or strategies(DR)	7
Assessment (AS)	7
Total	52

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment.

Teaching Reading Strategies Questionnaire (TRSQ) Student Form.

The Teaching Reading Strategies Questionnaire (TRSQ) student form was modified from the teacher form. It requires students to evaluate their perceptions concerning the reading strategies used by their teachers. The TRSQ student form consists of 50 items (see Table 14) that require responses pertaining to reading class instruction, reading resources used in class, reading activities, the promotion of reading comprehension and assessment practices in the class room. The time required to complete the measure is approximately 40 minutes. The students respond to the items using one of the following Likert anchors: always, often, sometime or never.

Table 14

Number of Items for TRSQ (students form) Subscales

Subscales	Number of Items
Reading instruction (RI)	6
Reading resources (RR)	16
Reading activities (RA)	14
Development of reading comprehension skills or strategies(DR)	7
Assessment (AS)	7
Total	50

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment.

Translation and Verification of Instruments

All the instruments were first prepared in English so they could be reviewed and accepted by the ethics committee of Victoria University. The measures were then translated into Arabic (the native language of the sample in Saudi Arabia). The process of translating the study instruments involved the following steps. First, the researcher translated the questionnaires from English into Arabic. Second, the two versions of the questionnaires (Arabic and English) were given to the certified translator from the Australian government to check the accuracy of the translations. Third, the professional Arabic editor gave his comments and suggestions. The researcher checked and verified the Arabic versions of the TRSQ, VARK and RAAF before both the pilot study and the main data collection.

Procedures of the pilot study

Arabic language teachers and students from five preparatory schools in Jeddah city were invited to be involved in the study. Additionally, more teachers from other schools were also invited but only to complete the TRSQ teacher form. Schools that agreed to

participate in the pilot study were provided with copies of the study information and consent forms for teachers and guardians of students. After the consent forms for students and teachers were completed, teachers working in the five schools were given one week to evaluate their students by using the RAAF. The students' final exam marks in the first term, identified by the acronym FT in the pilot study, were also requested from the schools. Taking into account their school's timetable, principals of schools determined the time for students to complete the measurements. Students then responded to the two VARK and TRSQ student forms. The total number of students who participated in the pilot study was 155. Some of the student sample responded to both questionnaires (85 students) and others only to TRSQ.

In the final stage of the pilot study, teachers completed the TRSQ teacher form and one group of teachers responded to a set of review questions about the TRSQ teacher form (see Appendix D). A total number of 50 teachers completed the questionnaire, with 20 teachers also responding to the review questions.

Data analysis

The main aim of the pilot study was to examine the validity and reliability of the Arabic version questionnaires used in the main study. The following statistical methods were used to examine the validity and reliability of the questionnaires:

Criterion validity of the Reading Achievement Assessment Form (RAAF) was examined using the students' first term scores in Arabic reading (FT) used as the criteria. Naglieri and Graham (2003) defined criterion validity as the correlation between scale and external pointer which reflects the confidence of the measure. Kaplan and Saccuzzo (2005) stated that:

> Criterion validity evidence tells us just how well a test corresponds with a particular criterion. Such evidence is provided by high correlations between a test

and a well defined criterion measure. A criterion is the standard against which the test is compared (p. 137).

The basic psychometric properties of the VARK were evaluated in the pilot study. Frequency counts and percentages were determined to describe the data and to examine the reliability of the VARK subscale correlations. The data derived from the VARK was categorised using two different methods. Firstly, students were classified according to their learning styles into two groups, multimodal style (M) and single style (S). The multimodal style group consisted of students who used more than one style to learn, whereas the single style category consisted of students who depended only on one style. The second classification method, labelled as VARK7G, categorised students into seven learning style groups that consisted of visual, aural, read/write, kinaesthetic, bi, tri and quad styles.

Reliability of the teacher and student TRSQ formats, was examined by calculating item subscale correlations and item deleted alpha coefficients. Internal consistency was determined by calculating Cronbach's alpha coefficient for each of the five subscales. The correlations between the subscale scores and total score of the questionnaire were also examined.

Results

From the original pilot sample of 155 students, only 85 responded to both the VARK and TRSQ student forms. Feedback concerning the student's questionnaire was generally related to the clarity of the items and the time required completing the questionnaires. Forty five teachers responded to the TRSQ questionnaire teacher's form, 4 of the 45 used the RAAF to evaluate their students and provided the researcher with first term exam results (FT) for their students. The subjects were requested to report on the clarity and comprehensibility of the items in the questionnaire, the time they needed to

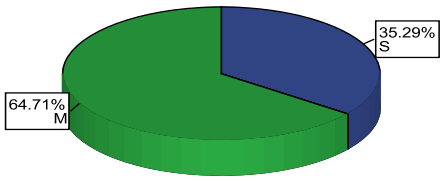
complete the questionnaire, any comments they had about the questionnaire and any suggestions they had for improving it.

The results of the pilot study showed that the time which students needed to complete the questionnaires ranged from 45 to 60 minutes for both questionnaires. Teachers reported that 60 to 90 minutes were needed to evaluate their students using the RAAF and 15 to 25 minutes to complete the TRSQ. Following the researcher's short discussion with students and the comments submitted by teachers, some items were modified on VARK, TRSQ teachers' and students' forms.

Standard psychometric techniques were used to verify the reliability and validity of the instruments used in this study. The Pearson product moment correlation coefficient was used to examine the correlation between RAAF and FT. Four teachers from 3 schools used RAAF to evaluate 85 students' reading skills. The correlation between RAAF and FT was significant, $r = .85$, $p < .001$, indicating a strong relationship between the RAAF and FT. The RAAF could, therefore, be used as an alternate approach to evaluate students' reading skills.

The VARK for younger people was used to examine students learning styles. A sample of 85 males and females from grade 7 and 8 responded to the VARK. Results of the pilot evaluation of the VARK are shown distributed students on deferent styles. Figure 9 presents the percentages of students who demonstrated a single learning style preference (35.29 %) and a multi modal learning style preference (64.71 %).

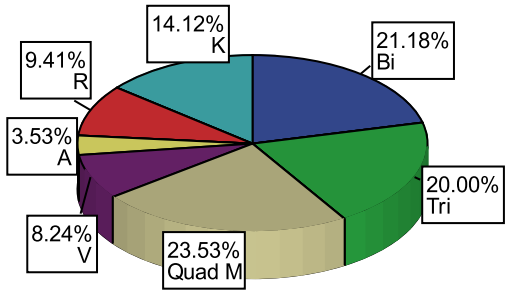
Figure 9. Students' single and multimodal learning style preferences



Abbreviation Note: S = Single style; M = Multimodal style

For the VARK7G the results indicated that the majority of students prefer the multimodal learning styles (quad, tri and bi). Figure 10 shows the percentages of students whose preferred learning styles were visual (8.2 %), auditory (3.5 %), reading/writing (9.4 %), kinaesthetic (14.1%), bi-modal (21.2%), tri-modal (20%) or quad-modal (23.5 %).

Figure 10. Students' VARK7G learning styls preferences

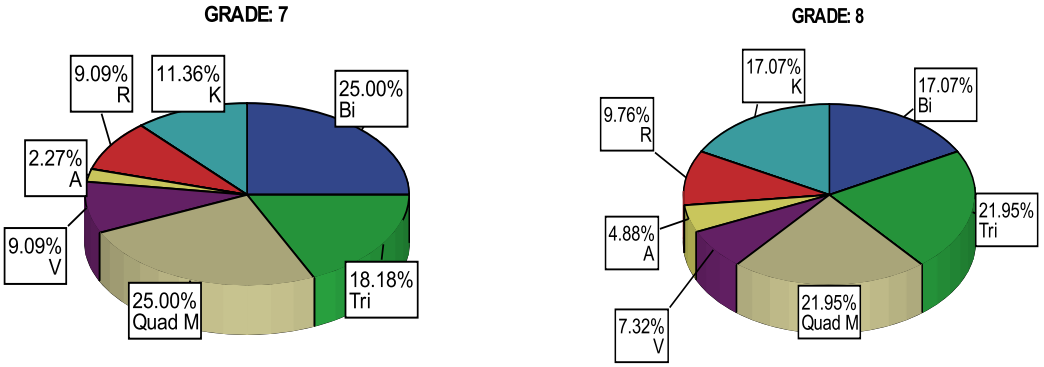


Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

Figure 11 shows the percentages of grade 7 and grade 8 students learning style preferences on VARK7G. For grade 7, the results highlighted similar percentages of students preferred single visual preference and single read/write (9.09 %), auditory (2.27 %), kinaesthetic (11.36 %), bi-modal (25 %), tri-modal (20%) and quad-modal (25 %) learning styles. In addition, similar percentages in tri-modal and quad-modal (22 %) were found for students in grade 8. The results also showed the same percentage distribution

was demonstrated for the bi-modal and single kinaesthetic preference (17.07 %). The percentage of students who preferred the visual style was (7.32 %); (4.88 %) reported a preference for the auditory style; and (9.76 %) a preference for the reading/writing styles.

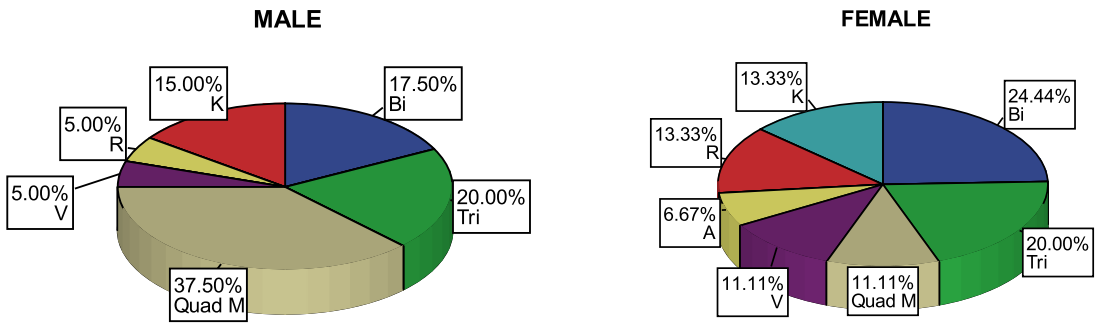
Figure 11. Grade 7 and 8 students' learning styles preferences



Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

Figure 12 shows the percentage of male and female students who preferred multimodal and single modal styles of information presentation. The same percentage of males and females preferred tri-modal (20 %). Of the students who preferred bi-modal, (17.5 %) were male and (24.44 %) were female. The quad modal style was the preference for (37.5 %) of males, whereas, it was preferred by only (11.11 %) of females. Within the student group who preferred a single mode for the presentation of information (either visual, aural, read/write or Kinaesthetic), (5.0 %) of male and (11.1 %) of female preferred visual, (6.67 %) of female preferred aural, (5.0 %) of male and (13.33 %) of female preferred read/write, and (15.0 %)of male and (13.33 %) of female preferred the kinaesthetic style.

Figure 12. Male and female students' VARK7G learning style preferences



Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

The inter correlation between VARK subscales and the total score of the VARK can be used to examine the reliability of the VARK. There was correlation between the total of VARK and VARK subscales r = .54, r = .64, r = .45 and r = .61, $p < .001$ The inter correlation between subscales was significant only between aural and kinaesthetic. Table 15 shows the correlations between VARK subscales.

Table 15

Correlations between VARK Subscales

	V	A	R	K
V				
A	.16			
R	-.08	.09		
K	.18	.25*	-.04	

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic. $p < .05$*

The reliability of the TRSQ, teacher's form, was assessed in the pilot study through the use of Cronbach's alpha coefficient and internal consistency and spilt half method. For the sample of 45 respondents, Cronbach's alpha was .92 and the split half coefficient was .95 for the the full questionnaire. Table 16 shows Cronbach's alpha values for the subscales of Reading Instruction (RI), Reading Resources (RR), Reading Activities (RA), Development of Reading comprehension skills (DR); and Assessment(AS). Internal consistency coefficients ranged from .35 to .90.

Table 16

Cronbach's Alpha and Item-Total Correlations for the TRSQ Subscales (Teachers' Form)

TRSQ subscales	Number of item	Cronbach's Alpha	Item – total correlations
RI	6	.35	-.10 – .32
RR	17	.90	-.17– .75
RA	15	.69	-.01 – .59
DR	7	.82	-.48 – .75
AS	7	.65	-.08 – .58

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment.

Four of five subscales of TRSQ (teacher form) had several items that had weak item-total correlations.Item-total correlations with a value less than .30 were removed. There were 3 of 6 items on the Reading Instruction; 1 of 17 items on Reading Resources; 4 of 15 items on Reading Activities and 1 of 7 items on Assessment. The items with a weak or uncertain correlation in subscale were deleted and the total number of items comprising the TRSQ decreased from 52 to 43. Subsequently, Cronbach's alpha for the questionnaire increased to .94. Furthermore, Cronbach's alpha for each subscale following item deletion are shown in the Table 17, and ranged from .52 to .91.

Table 17

Cronbach's Alpha and Item-Total Correlations for the TRSQ Subscales (Teachers' Form) After Items Deleted

TRSQ subscales	Number of item	Cronbach's Alpha	Item – total correlations
RI	3	.52	.30 – .38
RR	16	.91	.31 – .78
RA	11	.82	.25 –.65
DR	7	.82	.46 – .75
AS	6	.71	.24 –.60

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment.

Convergent validity of TRSQ teachers form was examined (see Table 18). Results indicated that all but one of the five were significantly correlated with other subscales and the total. The RR subscale was moderately to highly correlates with the other subscales and the total, whereas, RI had only weak correlations the other subscales and a moderate correlation with the total. According to Cohen (1988) a correlation is considered as weak or small if the correlation coefficient is between .10 and .30; the correlation is moderate if the correlation coefficient is between .30 and .50; and a strong or high correlation is indicated by a coefficient value of .50 or greater.

Table 18

Correlation Between Subscales and Total of TRSQ (teachers' form)

TRSQ	RI	RR	RA	DR	AS
RI					
RR	.25				
RA	.28	.54***			
DR	.15	.64***	.70***		
AS	.25	.62***	.58***	.74***	
TOTAL	.38**	.88***	.80***	.85***	.81***

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment. $p < .01$**, $p < .001$***

The reliability of the TRSQ student form was assessed in the pilot study through the use Cronbach's alpha coefficient and the split half method. For the sample of 155 students, Cronbach's alpha was .79 and the spilt half coefficient was .84. Table 19 shows the Cronbach's alpha values for the subscales of Reading Instruction (RI), Reading Resources (RR), Reading Activities (RA), Development of Reading comprehension skills (DR); and Assessment(AS).

Table 19

Cronbach's Alpha and Item-Total Correlations for the TRSQ Subscales (Students' Form)

TRSQ subscale	Number of item	Cronbach's Alpha	Item – total correlations
RI	6	.42	.05 – .38
RR	16	.68	.13 – .38
RA	14	.60	.15 – .40
DR	7	.68	.25 – 50
AS	7	.32	.03 – .21

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment.

Three of five subscales had several items that had weak item-total correlations. These were 3 of 6 items on the Reading Instruction; 3 of 14 items on Reading Activities; and 3 of 7 items on Assessment. The items which had a weak correlation within a subscale were deleted and the number of items for the total measure decreased from 50 to 41. Cronbach's alpha increased to .82 and the spilt half coefficient increased to .85. Table 20 shows Cronbach's alpha for the subscales following deletions, which ranged from .41 to .68.

Table 20

Cronbach's Alpha and Item-Total Correlations for the TRSQ Subscales (Students' Form) After Items Deleted

TRSQ subscale	Number of item	Cronbach's Alpha	Item – total correlations
RI	3	.55	.40– .51
RR	16	.68	.13 .38
RA	11	.64	.17– .39
DR	7	.68	.25– .50
AS	4	.41	.31– .39

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment.

Convergent validity of TRSQ students form was also examined (see Table 21). Results indicated that all but one of the five subscales were significantly correlated with other subscales and the total. RA, DR AS subscales were moderately correlated with the other subscales and strongly correlated with the total measure score. RI had only weak correlations with other subscales and total.

Table 21.

Correlations Between Subscales and Total TRSQ Students' Form

TRSQ	RI	RR	RA	DR	AS
RI					
RR	.08				
RA	.02	.41**			
DR	.067	.36**	.42**		
AS	.037	.34**	.44**	.46**	
TOTAL	.27**	.78***	.76***	.68***	.65***

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment. . p < .01**, p < .001***

Summary

The purpose of this chapter was to investigate the adequacy of the instruments to be used in the study and to examine the validity and reliability of the measures. Data and feedback were gathered from the sample used in this phase and some adjustments have were made as a result of this information. The number of items for each subscale of the TRSQ questionnaires varied, suggesting the reading strategy focus of each subscale necessitates a unique range of questions to successfully identify participants' experiences. The instability of the item-total correlation for each subscale in TRSQ students form could be due to a number of reasons. For example, the age of respondents may be affecting their understanding of the items, the length of the questionnaire may lead to students giving random answers; or the items could describe some educational experiences that are not easily perceived by students.

Chapter 5: Main Study

The study was designed to examine the learning styles of Saudi preparatory schools students who were evaluated as high or low in reading achievement. This chapter details the research questions and outlines the methodological framework including the research design, description of the variables, sample composition, measurement instruments, procedure of data collection and data analysis. The main study results and discussion are also presented in this chapter.

Research questions

The principal question for this study is: Are there differences in the learning styles of students low or high in Arabic reading performance?

This principal question also comprises several sub questions:

1: What are the main preferences in learning styles of male and female grade seven and eight students, attending preparatory schools in Jeddah Saudi Arabia, who are either low or high in reading achievement?

2: Are there differences in learning style preferences of students grouped as high or low reading achievement scores?

3: Are there differences between male and female students in their learning styles preferences?

4: What are the relationships between the teachers' teaching strategies and the reading achievements of students?

5: What are the relationships between the students' preferred teaching reading strategies and their reading achievement scores?

6: What is the relationship between the components of the students' preferred reading teaching strategies and their preferred learning style?

Method

In this section, the research methods are discussed. The section comprises research design, description of the variables, sample composition, measurement instruments, procedure of data collection and data analysis.

Research Design

The current research constitutes a descriptive study in which quantitative data collection methods were used. There are two main groups of students in this study: first, students with high achievement in reading, second group, students with low achievement in reading. Each of the reading achievement groups was divided into subgroups according to gender (male or female) and according to grade (7 or 8). Data were collecting in three phases.

Description of the Variables

Variables examined in this study included students' learning styles, teaching reading strategies, Arabic reading achievement and demographic characteristics. Learning styles, teaching reading strategies and reading achievement are interval variables. The demographic variables of gender and grade are nominal.

This study had one dependent variable that was the attainment of students in Arabic reading in grade 7 and 8 at preparatory schools at Jeddah city. The independent variables were the learning styles of the student, teaching reading strategies and demographic variables particularly the gender and grade.

Study Sample

The population from which the sample for this study was drawn constitutes the 287 preparatory public schools of the Jeddah administrative area of Saudi Arabia that were operational during the 2008-2009 school years. Jeddah is the second largest city in the kingdom of Saudi Arabia and is in the west region. The area inhabited is more than 1500

square kilometres and the population is more than one and a half million. This research focused on students and teachers in Jeddah city. The area was selected because it is the second most urbanized area in the kingdom of Saudi Arabia.

According to Ministry of Education website (2009) in Saudi Arabian school year (2008/2009) the total number of preparatory schools in Jeddah city was 287 schools consisting of 140 schools for boys and 147 for girls. In addition, those schools involved 8052 classes of the grade 7 and 8 level; 3965 classes in the boy schools and 4087 in the girls schools. In the 2008-2009 school years, the number of students who enrolled in those schools at grade 7 and 8 levels was 77788; of which 39440 students in the schools for boys and 38348 were in the schools for girls. Also 1086 Arabic teachers employed in preparatory schools; 522 male and 564 female. The schools were randomly selected from the 287 schools. Salvatore and Reagle (2001) suggested random sampling is one of the techniques used by the researcher to select the sample and the population so that any group or individual has an equal chance of being included in the sample. Kerlinger and Lee (2000) justified the importance of the random sampling technique because it is required inferential statistics.

The Education Department of Jeddah divides the city into four regions: South, Central, East and North. One school for male students and one school for female student were randomly selected from each region as the sample in the study (see Table 22). A total of 8 schools were randomly selected as population for the study; 4schools for males and 4 for female. The sample selection in this study was based on the following criteria: 1- preparatory schools in Jeddah city only, 2- schools selected randomly, 3- Arabic reading teachers within the schools selected randomly, 4- the teachers were working with grade 7 and 8, 5- the students within the classes selected agreed to participate in the study. Table

22 shows the schools that were selected as the sample in the study according to number of students, gender and region.

Table 22

Demographics of the Participating Schools of the Main Study

School Name	Number of Students	Gender	Region
Al thager	76	Boy	South
First	58	Girl	
Al imam Al shaapy	61	Boy	Central
Thirteen	74	Girl	
Al fateh	77	Boy	East
Eighty nine	80	Girl	
Prince Sultan	77	Boy	North
Ninety four	99	Girl	

A teacher involved in the teaching of Arabic reading at grade 7 and another teacher involved at grade 8 were selected randomly from each school. A total of 16 teachers were selected. The students within these classes were invited to participant in the study and 33% from the top and 33% from the bottom were selected from each group (male and female) according to their score in both the Reading Achievement Assessment Form (RAAF) and first term reading exam performance (FT).

The research design and statistical techniques used in the study necessitated the researcher ensure that the minimum sample size requirements for these procedures were considered. According to Cohen et al. (2000) “for quantitative data a precise sample number can be calculated according to the level of accuracy and the level of probability that the researcher requires in her work” (p.95). Stevens (2002) verified that sample size is determined by several factors such as power of the test, effect size, alpha level for

controlling type I error and the number of variables. In regards to the statistical power analysis for this study, using a sample of 399 students in second phase the MANOVA and regression analyses will result in power level of .80 and .65 respectively.

The researcher sought a pool of 8 male and 8 female teachers and students in preparatory schools from all four regions in Jeddah city. The procedure for the random selection of schools involved writing down all the male schools' names from within a district individually, placing the names in one box and selecting only one. The same procedure was repeated for the female schools and for all four regions. A teacher involved in the teaching of Arabic reading at grade 7 and another teacher involved at grade 8 were also selected randomly from each school. The target sample size of the teachers was 16, 8 for male schools and 8 for female schools. The students within these classes participated in this study; the student cohort within classes was between 35 and 50 students and the final sample in the first phase of the study comprised 602 students. Table 23 shows the number of students according to gender and grade who participated in the first phase of the study.

Table 23

Sample Composition in the First Phase of Study

Grades	Male	Female	Total
7	150	155	305
8	140	157	297
Total	290	312	602

On the basis of the students' results for the RAAF and FT, only the upper and the lower 33 per cent of students of the sample of 602 were selected for the second phase of this study. A total cohort of 399 students from eight schools participated. The number and percentage of students from each male and female school, grouped according to their grade level are shown in Table 24. The sample comprised 192 male and 207 female students, 203

from grade 7 and 196 from grade 8. The regional composition of the student sample was 94 from the southern, 101 from the central, 84 from eastern, and 120 from the northern areas of Jeddah city.

Table 24

Compostion of Students Participating in the Second Phase of the Study

Grade		Male schools				Female schools				Total
		1	2	3	4	5	6	7	8	
7	N	30	24	24	22	22	24	20	37	203
	%	7.5	6.0	6.0	5.5	5.5	6.0	5.0	9.3	50.9%
8	N	24	21	20	27	18	32	20	34	196
	%	6.0	5.3	5.0	6.8	4.5	8.0	5.0	8.5	49.1%
Total	N	54	45	44	49	40	56	40	71	399
	%	13.5	11.3	11.0	12.3	10.0	14.0	10.0	17.8	100%

Measures

The Reading Achievement Assessment Form (RAAF), VARK, and student and teacher forms of the Teaching Reading Strategies Questionnaire (TRSQ) are discussed in detail at chapter four. The following is a brief summary that outlines the value of the instruments used in this study.

Reading Achievement Assessment Form (RAAF).

The Arabic reading teachers evaluated their student in five reading skill areas; comprehension, fluency, understanding tense, vocabulary and reading summary. They used the following assessment categories; Excellent (5), V. Good (4), Good (3), Satisfactory (2) and Weak (1) (Appendix B).

VARK questionnaire - the younger version.

VARK is one of two questionnaires that the grade 7 and 8 students completed in the study. The questionnaire was designed by Neil Fleming and consists of 16 questions (Appendix C). The researcher has permission to used VARK questioner (Appendix D).

Teaching Reading Strategies Questionnaire (TRSQ) ***(Teacher Form)***

Teachers also responded to the Teaching Reading Strategies Questionnaire (Teacher form). The TRSQ self report questionnaire used in the present study consist of 43 items (Appendix E).

Teaching Reading Strategies Questionnaire (TRSQ) ***(Student Form)***

Students' participant also responded to Teaching Reading Strategies Questionnaire (student Form*)* which consists of 41 items (Appendix F). It is self report questionnaire.

Procedure of Data Collection

Following receiving approval for the research program from the Human Research Ethics Committee of Victoria University the researcher commenced the recruitment program for participants. Permission for data collection from the Education Department in Jeddah was required as the part of ethics application at Victoria University (Appendix, G).

Full list of the preparatory schools was obtained from the Education Department in Jeddah for the random selection the schools sample. Then the researcher contacted the Principal responsible of each school to determine the time to visit the school.

A meeting was held with the Principal of each school to outline the recruitment procedures for the Arabic teachers in grades 7 and 8. One teacher from each grade was randomly selected and the teachers selected were given the opportunity to read the information sheet and indicated if they were willing to be involved in the project gave their formal consent to participate in the study. In parallel the schools responsible sent the information and consent form to the students' guardians.

In the first phase of data collection, teachers were given a time frame of one week to two weeks to evaluate their students in Arabic reading skills using RAAF; and asked to provide the researcher the FT exam scores for their students in Arabic reading. Several teachers asked to extend the time to complete the RAAF to 15 days. RAAF and FT exam data were collected from 8 schools and the students were then categorized in the four groups according to gender and grade. The next phase of categorization involved grouping the highest and lowest third of students from each of the previous categories on the basis of their combined RAAF and FT scores.

The time and place to work with students was organized by the principal of the school and the class teacher and therefore linked to the time table of class and the availability of a suitable activity room in the schools. In the schools that had large activity rooms, the researcher worked with the grade 7 and 8 participants as the same time. At the commencement of the session the researcher explained the response procedures pertaining to the VARK and TRSQ (student form) Arabic version questionnaires. Time is allocated for students to ask questions about the measures. The majority of students take between 50 and 70 minutes to complete the two questionnaires. In last phase the Arabic reading teachers were asked to complete the TRSQ questionnaire (teacher form) Arabic version, which took approximately 15 – 20 minutes. The data were collected in the second term of Saudi Arabian schools year (1429/1430) (2008/2009).

Data analysis

Students were distributed according to their reading achievement scores in RAAF and FT into clusters that represented the highest and lowest thirds for both males and females and year level groups. Eight groups were formed using the following criteria: (a) Grade 8 male/ high RAAF and high FT exam score; (b) Grade 7 male/ high RAAF and high FT exam score; (c) Grade 8 male/ low RAAF and low FT exam score; (d) Grade 7

male/ low RAAF and low FT exam score; (e) Grade 8 female/ high RAAF and high FT exam score; (f) Grade 7 female/ high RAAF and high FT exam score; (g) Grade 8 female/ low RAAF and low FT exam score; (h) Grade 7 female/ low RAAF and low FT exam score.

Data gathered from the study sample were organized, coded and recoded. SPSS (version, 17) statistical software was used for analysis of the quantitative data collected from the questionnaires. Prior to undertaking the analyses pertinent to each research question, normality tests were run on the relevant variables. This was done to determine whether parametric or nonparametric were more appropriate for certain analyses. The data derived from the VARK was categorised using two different methods. Firstly, students were classified according to their learning styles into two groups, multimodal style (M) and single style (S). The multimodal style group consisted of students who used more than one style to learn, whereas the single style category consisted of students who depended only on one style. The second classification method, labelled as VARK7G, categorised students into seven learning style groups that consisted of visual, aural, read/write, kinaesthetic, bi, tri and quad styles. The data were then statistically analysed to address the six research questions posed at the above of this chapter. Descriptive statistics including frequencies and percentages were calculated, and chi-square analyses completed to determine the relationships between the main preferences in learning styles of male and female grade seven and eight students, who were either low or high in reading achievement.

A multivariate analysis of variance MANOVA was conducted to check for significant differences in reading achievement for student according to their learning styles in the second question. MANOVA was used to examine the difference in RAAF score and FT exam score between the VARK subgroups. Bray and Maxwell (1985) enumerate the

reasons to use the MANOVA technique one of this reason if "the researcher wants to look at the relationships among the variables rather than looking at each of them in isolation" (p.10). According to Fraenkel and Wallan (2006) analysis of variance is used when the researchers aspiration to find out whether there are significant differences between the means of two or more. In the case of significant differences the multiple comparison post hoc used. Fraenkel et al. (2006) determine that when more than two groups are being compared a post hoc analysis was used to find out which groups were significantly different from the other groups. The post hoc comparisons used a significance level of .05.

Descriptive statistics including frequencies and percentages of the dominant learning styles within the groups of males and females were calculated to address the third research question. Chi-square analyses were completed to evaluate the relationships between gender and preferred learning style.

In relation to the fourth research question, Person Product Moment Correlations were determined to investigate the relationships between the five subscales of the TRSQ teacher form and the student scores in RAAF and FT exam performances.

For the fifth research question a hierarchical multiple regression was used to determine which of the students' five strategies subscale of the TRSQ student form was the strongest predictors of their RAAF and FT exam performances. Ott and Longnecker (2006) infer that "the statistical method most widely used in making predictions is regression analysis" (p.621). A hierarchical multiple regression analysis was conducted using five steps to investigate if the subscales of the TRSQ can significantly predict students reading achievement as assessed by the RAAF and FT. The sequence of steps to enter the TRSQ variables was: Step 1 - reading instruction (RI); Step 2 - reading instruction (RI) and reading resources (RR); Step 3 - reading instruction (RI), reading resources (RR) and reading activities (RA); Step 4 - reading instruction (RI), reading

resources (RR), reading activities (RA), development of reading comprehension skills or strategies (DR); and Step 5 - reading instruction (RI), reading resources (RR), reading activities (RA), development of reading comprehension skills or strategies (DR) and assessment (AS).

Basic descriptive statistics including frequency and percentage were calculated to address the sixth research question. The students were distributed into subgroups according to both their learning style preference and their subscale responses to the TRSQ and the relationships between the groups evaluated suing chi-square analysis.. To support the chi-square analysis, the total mean scores of each sub-scale of the TRSQ students form were calculated. The total mean score refers to the sum of item scores divided by number of items. The total mean scores were calculated to two decimal points but were subsequently adjusted to match the scale items as presented in the questionnaire. The new criteria were set as follows: scores ranging from 1 to 1.49 were ranked as 1 (never); scores ranging from 1.50 to 2.49 were ranked as 2 (sometimes); scores ranging from 2.50 to 3.49 were ranked as 3 (often); and scores ranged from 3.50 to 4 were ranked as 4 (always).

Results

This section presents the study results associated with each of the six research questions.

Research question 1

Participants' were grouped according to their gender, grade level and reading achievement scores as the classification basis for the investigation of their preferred learning styles. The frequencies and percentages of students' learning styles preferences in the low and high reading achievement categories were calculated for each of the genders and class levels. Table 25 shows the frequency and percentage results for the single and

multimodal learning style preferences of grade 7 male (G7M) students with low and high reading achievement.

Table 25

Multimodal and Single Learning Style Preference Frequencies and Percentages for G 7 M Students High or Low in Reading Achievement

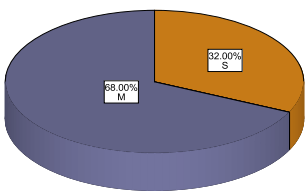
		S	M	Total
Low Reading	f	16	34	50
Achievement	%	32	68	100
High Reading	f	10	40	50
Achievement	%	20	80	100
Total	f	26	74	100
	%	26	74	100

Abbreviation Note: S = Single style; M = Multimodal style

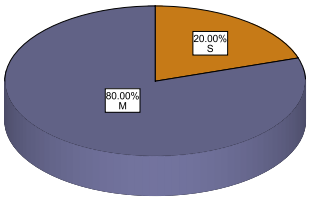
The majority of students in both the low and high reading achievement groups preferred a multimodal learning style (see Figure 13).The high reading achievement group demonstrated the strongest preference for the multimodal learning style. However, chi-square results indicated there were no significant association in the percentages of low and high reading achievement students who preferred multimodal or single learning styles of information, $\chi^2(1, N = 100) = 1.87, p = .13$. The association was small $\phi = .111$ and therefore the students preferred learning style accounted for 1.2 % of variance in the reading achievement.

Figure 13. Percentages of multimodal and single learning styles for G 7 M students high or low reading achievement

Low reading achievement G 7 M



High reading achievement G 7 M



Abbreviations Note: G 7 M = Grade Seven Male

Table 26 shows the percentages and frequencies of grade 7 male students with a high or low reading achievement according to their VARK 7G learning styles categories. Grade 7 male students distributed differently in both reading achievement groups.

Table 26

VARK7G Preference Frequencies and Percentages for G 7 M Students High or Low in Reading Achievement.

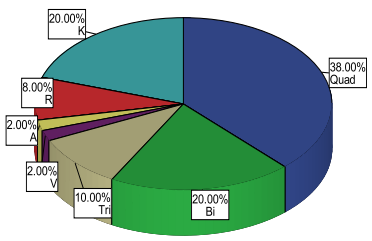
		Quad	Tri	Bi	V	A	R	K	Total
Low Reading achievement	f	19	5	10	1	1	4	10	50
	%	38	10	20	2	2	8	20	100
High Reading achievement	f	23	13	4	5	1	2	2	50
	%	46	26	8	10	2	4	4	100
Total	f	42	18	14	6	2	6	12	100
	%	42	18	14	6	2	6	12	100

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

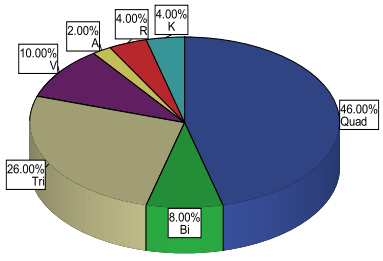
Figure 14 demonstrates that quad style was the preferred learning style in both groups of reading achievement, with a higher percentage of the students preferring these styles in the high reading achievement group. The percentage of tri learning styles was larger for the high reading achievement group whereas the percentage of the bi learning style in the low group was larger than in the high group. The same percentage was recorded in both groups for the aural learning style. The kinaesthetic learning style in the low group demonstrated the highest single style percentage and was much greater than that found in the high group. In addition, the visual learning style was substantially greater in the high reading achievement group. There were significant chi square association in the percentage of low and high reading achievement students who preferred the quad, tri, bi, V, A, R, K styles of information, $\chi^2(6, N = 100) = 15.17$, $p = .02$. The association was of small strength: $\phi = .352$ and therefore the students preferred learning style accounted for 12.3 % of variance in the reading achievement scores.

Figure 14. Percentages of VARK7G learning styles for G 7 M students high or low reading achievement

L reading achievement G 7 M



H reading achievement G 7 M



Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

Table 27 presents the percentages and frequency of multimodal and single learning styles among female students in grade 7(G 7 F) with low or high reading achievement.

Table 27

Multimodal and Single Learning Style Preference Frequencies and Percentages for G 7 F Students High or Low in Reading Achievement.

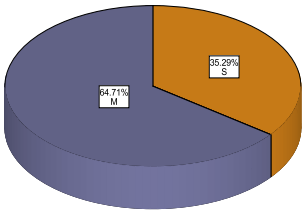
		S	M	Total
Low Reading Achievement	f	18	33	51
	%	35	65	100
High Reading Achievement	f	24	28	52
	%	46	54	100
Total	f	42	61	103
	%	40	60	100

Abbreviation Note: S = Single style; M = Multimodal style

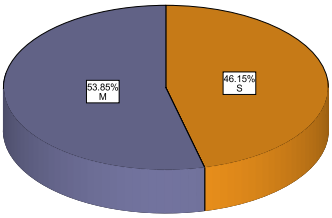
Figure 15 shows the percentages of the multimodal and single learning styles for grade 7 female students. The percentage of multimodal learning styles was larger in the low reading achievement group. Only small differences were found between the single and multimodal learning styles in the high group. In general there were no significant association between the reading achievement groups in the percentages of students who preferred a multimodal and single style, χ^2 (1, N = 103) = 1.26, p = .26. The association was ϕ = .110 and therefore the students preferred learning style accounted for 1.2 % of variance in the reading achievement.

Figure 15. Percentages of multimodal and single learning styles for G 7 F students high or low reading achievement

L reading achievement G 7 F



H reading achievement G 7 F



Abbreviation Note: S = Single style; M = Multimodal style

The frequencies and percentages of the grade 7 female students' shows different distribution between reading achievement groups according to their VARK 7 style preferences. Table 28 shows the frequencies and percentages in the seven learning style subgroups for grade 7 female students categorised low or high in reading achievement.

Table 28

VARK7G Preference Frequencies and Percentages for G 7 F Students High or Low in Reading Achievement

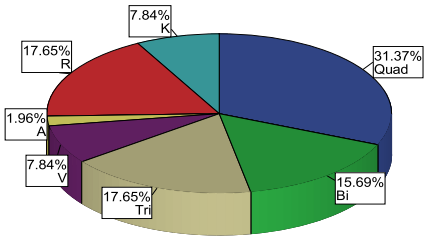
		Quad	Tri	Bi	V	A	R	K	Total
Low Reading	f	16	9	8	4	1	9	4	51
achievement	%	31	18	16	8	2	18	8	100
High Reading	f	14	2	12	4	3	5	12	52
achievement	%	27	4	23	8	6	9	23	100
Total	f	30	11	20	8	4	14	16	103
	%	29	11	19	8	4	14	15	100

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

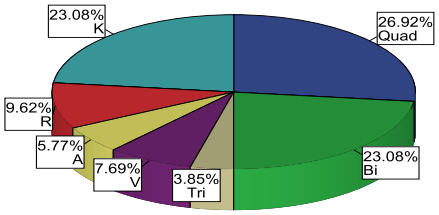
Figure 16 shows the learning style percentages of low and high reading achievement grade 7 female students. Each reading achievement group has own distributed on VARK7G categories.

Figure 16. Percentages of VARK7G learning styles for G7F students high or low reading achievement.

L reading achievement G 7 F



H reading achievement G 7 F



Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

Those with a quad learning style are a large percentage in both groups of reading achievement. In addition, the percentage of those using a tri learning style in the low group is substantially higher than in the high group. In the high achievement group however the percentage of students who have a bi learning style preference is large. In relation to the single modes of learning styles the students in the high group demonstrated a clear preference for the Kinaesthetic learning style while low group students preferred the read/write learning style. However, overall there were no significant association in the percentages of low and high students who preferred quad, tri, bi, V, A, R, or K styles of information, χ^2 (6, N = 103) = 11.522, p = .07. The association was ϕ = .334 and therefore the students preferred learning style accounted for 11.1 % of variance in the reading achievement.

Table 29

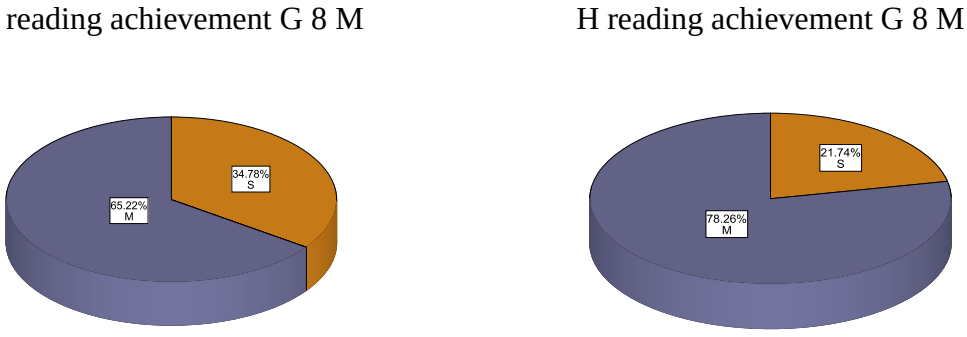
Multimodal and Single Learning Style Preference Frequencies and Percentages for G 8 M Students High or Low in Reading Achievement

		S	M	Total
Low Reading achievement	f	16	30	46
	%	35	65	100
High Reading achievement	f	10	36	46
	%	22	78	100
Total	f	26	66	92
	%	28	72	100

Abbreviation Note: S = Single style; M = Multimodal style

Table 29 presents the frequency of male students in grade 8 with low or high reading achievement groups. In grade 8 male students the results draw attention to percentage differences between the two achievement groups reading in multimodal or single learning styles methods.

Figure 17. Percentages of multimodal and single learning styles for G 8 M students high or low reading achievement



Abbreviation Note: S = Single style; M = Multimodal style

Figure 17 presents the percentage contrasts for the multimodal and single learning styles of grade 8 male students. The majority of students in both groups of grade 8 male

students preferred multimodal learning styles with a marginally higher percentage of students found in the high reading achievement group. There were no significant chi square association in the percentage of students with high or low reading achievement who preferred the multimodal or single learning styles, $\chi^2(1, N = 92) = 1.930$, $p = .16$. The association was $\phi = .145$ and therefore the students preferred learning style accounted for 2.1 % of variance in the reading achievement

Table 30

VARK7G Preference Frequencies and Percentages for G 8 M Students High or Low in Reading Achievement

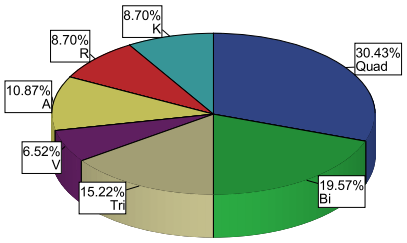
		Quad	Tri	Bi	V	A	R	K	Total
Low Reading	f	14	7	9	3	5	4	4	46
achievement	%	30	15	20	6	11	9	9	100
High Reading	f	18	8	10	1	2	3	4	46
achievement	%	39	17	22	2	4	7	9	100
Total	f	32	15	19	4	7	7	8	92
	%	35	16	21	5	7	7	9	100

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

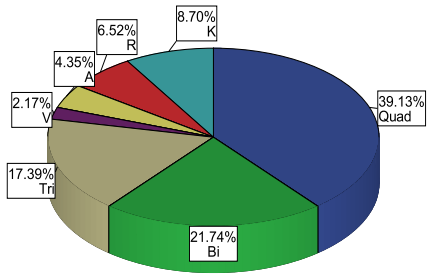
Further investigation into differences between high and low reading achievement groups within grade 8 male students was achieved by examining the VARK 7 groups. Table 30 shows the frequency and percentage of learning preferences between the two reading achievement groups in the grade 8 male students.

Figure 18. Percentages of VARK7G learning styles for G 8 M students high or low reading achievement

L reading achievement G 8 M



H reading achievement G 8 M



Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

Figure 18 shows the learning style percentages of low and high reading achievement grade 8 students. A quad learning style is considered as a common style amongst grade 8 males students overall. Students who preferred quad learning style in the high group were larger in number than students in the low group. A bi learning style was the second most frequent learning style among male grade 8 students followed by the tri style. The percentage of students who preferred bi and tri learning styles in the high group was greater than the percentage of students in the low group. A kinaesthetic learning style had a similar percentage in both groups, whereas, the percentage of visual, aural and read/write learning styles in the low group was higher than the percentage of similar learning styles in the high group. Overall however, there were no significant association in the percentages of low and high students who preferred quad, tri, bi, V, A, R, or K styles of information, χ^2 (6, N = 92) = 3.048, p = .80. The association was ϕ = .182 and therefore the students preferred learning style accounted for 3.3 % of variance in the reading achievement.

Table 31

Multimodal and Single Learning Style Preference Frequencies and Percentages for G 8 F Students and High and Low Groups

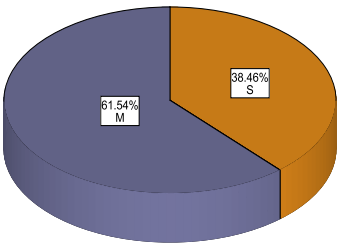
		S	M	Total
Low Reading Achievement	f	20	32	52
	%	38	62	100
High Reading Achievement	f	19	33	52
	%	37	63	100
Total	f	39	65	104
	%	37.5	63.5	100

Abbreviation Note: S = Single style; M = Multimodal style

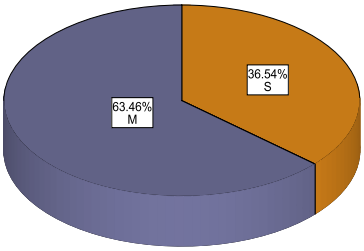
Table 31 shows the frequency and percentage between single and multimodal learning styles preferences of female students in grade 8 (G 8 F) with low or high reading achievement. Figure 19 shows the percentage differences in singles and multimodal learning styles methods between the two grades 8 female reading achievement groups.

Figure 19. Percentages of multimodal and single learning styles for G 8 F students high or low reading achievement

L reading achievement G 8 F



H reading achievement G 8 F



Abbreviation Note: S = Single style; M = Multimodal style

In general, Figure 19 indicated that the percentage of multimodal and single learning styles preferences has a convergent number in both reading achievement groups.

There were no significant chi square association between students in the high and low reading achievement groups who preferred a multimodal or single learning style $\chi^2(1, N = 104) = .041$, $p = .83$. The association was $\phi = .020$ and therefore the students preferred learning style accounted for 0.04 % of variance in the reading achievement

Table 32

VARK7G Preference Frequencies and Percentages for G 8 F Students and High and Low Groups

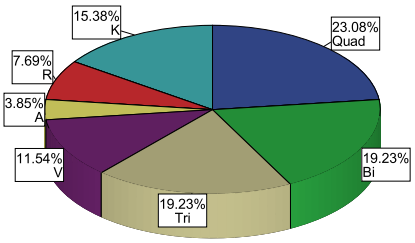
		Q	Tri	Bi	V	A	R	K	Total
Low Reading	f	12	10	10	6	2	4	8	52
achievement	%	23	19	19	12	4	8	15	100
High Reading	f	13	7	13	4	5	5	5	52
achievement	%	25	13.5	25	7.7	9.6	9.6	9.6	100
Total	f	25	17	23	10	7	9	13	104
	%	24	16	22	10	7	9	12	100

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

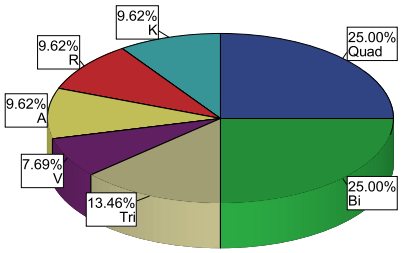
Table 32 presents the distributions by frequency and percentage of female Grade 8 students in the VARK 7 groups. The majority of students in both reading groups preferred the multimodal learning style.

Figure 20. Percentages of VARK7G learning styles for G 8 F students high or low reading achievement

L reading achievement G 8 F



H reading achievement G 8 F



Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

Figure 20 shows the majority of students in both reading groups preferred the multimodal learning style. The percentage of students in the high reading achievement group who preferred a quad or bi learning style was equal, as was the percentage of students in the low reading achievement group who preferred bi or tri learning style. However, the percentage of those who preferred a kinaesthetic learning style in the low group was nearly double that of those who preferred kinaesthetic style in the high group. Furthermore, the percentage of aural and read/write learning styles in the high group was larger than in the low group. The percentage of visual learning style was greater in the low reading achievement group. Overall, there were no significant association in the percentages of low and high reading achievements students who preferred quad, tri, bi, V, A, R, or K styles of information $\chi^2(6, N = 104) = 3.450$, $p = .75$. The association was $\phi = .182$ and therefore the students preferred learning style accounted for 1.6 % of variance in the reading achievement

Table 33

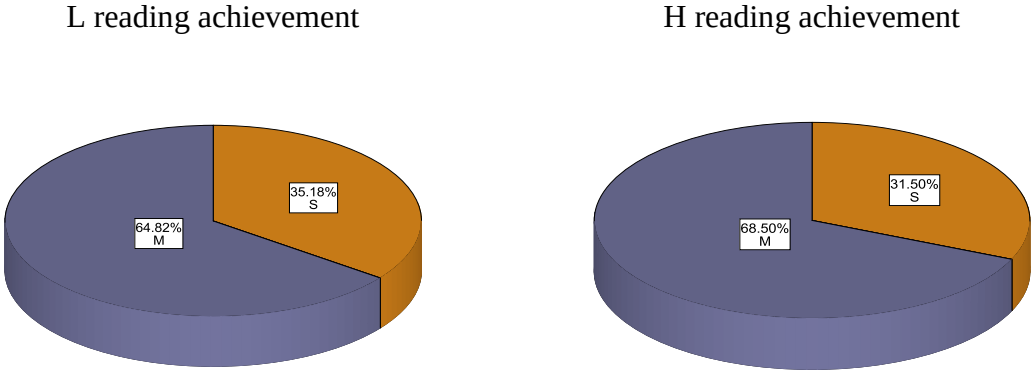
Multimodal and Single Learning Style Preference Frequencies and Percentages for All Students and High and Low Groups

		S	M	Total
Low Reading achievement	f	70	129	199
	%	35	65	100
High Reading achievement	f	63	137	200
	%	32	68	100
Total	f	133	266	399
	%	33	67	100

Abbreviation Note: S = Single style; M = Multimodal style

For all participants, in grades 7 and 8 the results show the percentage differences between the two reading achievement groups in multimodal or single learning styles preferences. Table 33 shows the frequency and percentage of all students in the low or high reading achievement groups. Multimodal learning styles was the preferred styles for large percentage of students.

Figure 21. Percentages of multimodal and single learning styles for students high or low reading achievement



Abbreviation Note: S = Single style; M = Multimodal style

Figure 21 indicates the majority of the total number of participants in both the low and high reading achievement groups preferred multimodal learning style, while, approximately one third of students preferred a single learning style. There were no significant association between high and low reading achievement groups who preferred a multimodal or single learning style $\chi^2(1, N = 399) = .607$, $p = .43$. The association was $\phi = .039$ and therefore the students preferred learning style accounted for 0.1% of variance in the reading achievement.

Table 34

VARK7G Preference Frequencies and Percentages for All Students and High and Low Groups

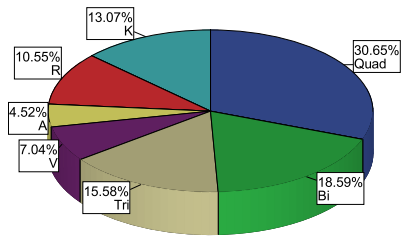
		Q	Tri	Bi	V	A	R	K	Total
Low Reading	f	61	31	37	14	9	21	26	199
achievement	%	31	16	19	7	4	10	13	100
High Reading	f	68	30	39	14	11	15	23	200
achievement	%	34	15	19	7	5	8	12	100
Total	f	129	61	76	28	20	36	49	399
	%	32	15	19	7	6	9	12	100

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write

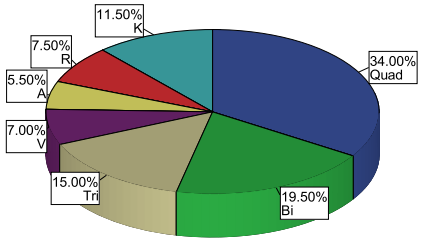
The frequency and percentage for all students with low or high reading achievement in the seven learning style subgroups shows in Table 34. This table shows the distribution of participants in low and high reading achievement groups across the VARK 7 groups.

Figure 22. Percentages of VARK7G learning styles for students high or low reading achievement

L reading achievement all student



H reading achievement all student



Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic

Figure 22 shows that the quad learning style is preferred by a large percentage in both groups. There are no large differences in percentage between the reading achievement group in bi and tri learning styles performance. The kinaesthetic learning style has a larger percentage in the low group compared with the high group. In addition, the percentage of students who preferred read/write learning style in the low group was greater. The percentage of those with a visual learning style in both groups was a similar, and there was little difference between the percentages of students who preferred an aural learning style in both groups. overall, there were no significant association between students in the high and low reading achievement groups who preferred quad, tri, bi, V, A, R, or K styles of information $\chi^2(6, N = 399) = .1.830$, $p = .93$. The association was $\phi = .068$ and therefore the students preferred learning style accounted for 0.4 % of variance in the reading achievement.

Research question 2

The Means and standard deviations of reading achievement for VARK7Glearning style categories showed in Table 35. Visual students in both genders achieve higher scores on RAAF.

Table 35

Means and Standard Deviations of RAAF and FT Scores for the VARK7G Learning Style Categories

Gender	Grade	Reading Assessment		Learning Styles						
				Quad	Bi	Tri	V	A	R	K
Males	Grade 7	RAAF	*n*	42	14	18	6	2	6	12
			M	18.31	14.50	18.39	22.50	15.00	13.67	12.50
			SD	6.96	6.14	7.05	5.20	8.48	9.20	6.33
		FT	*M*	44.21	42.00	44.67	47.33	41.50	38.83	40.75
			SD	7.09	6.88	7.58	5.20	9.19	8.97	7.17
	Grade 8	RAAF	*n*	32	19	15	4	7	7	8
			M	20.69	20.63	19.47	18.75	15.71	17.43	19.00
			SD	5.07	4.99	5.38	4.34	6.02	5.6	5.26
		FT	*M*	42.97	42.74	44.20	39.00	40.00	44.00	44.75
			SD	6.97	7.33	4.69	9.01	7.30	6.85	4.62
	Total	RAAF	*n*	74	33	33	10	9	13	20
			M	19.33	18.03	18.87	21.00	15.55	15.69	15.10
			SD	.73	1.09	1.09	1.99	2.10	1.75	1.41
		FT	*M*	43.67	42.42	44.45	44.00	40.33	41.61	42.35
			SD	.81	1.21	1.21	2.20	2.32	1.93	1.55
Females	Grade 7	RAAF	*n*	30	20	11	8	4	14	16
			M	21.50	21.60	20.00	21.75	23.25	20.57	23.25
			SD	3.46	4.16	2.64	3.05	2.05	2.21	3.69
		FT	*M*	46.73	46.85	44.27	47.38	47.75	45.21	47.75
			SD	3.37	3.85	3.34	2.26	1.89	4.54	3.69
	Grade 8	RAAF	*n*	25	23	17	10	7	9	13
			M	21.72	22.17	21.00	21.00	22.71	22.22	20.31
			SD	3.68	3.68	3.60	3.88	4.27	3.83	4.38
		FT	*M*	46.84	46.43	45.76	45.50	46.86	46.22	44.62
			SD	3.62	4.52	3.83	4.08	5.39	4.60	4.43
	Total	RAAF	*n*	55	43	28	18	11	23	29
			M	21.60	21.91	20.61	22.91	21.22	21.93	21.58
			SD	3.53	3.87	3.24	3.46	3.53	3.75	3.62
		FT	*M*	46.78	46.63	45.18	46.33	47.18	45.61	46.34
			SD	3.45	4.18	3.66	3.44	4.33	4.49	4.30

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic, RAAF = Reading Achievement Assessment Form, FT = First Term scores

Furthermore, the mean and standard deviation of reading achievement for multimodal and single learning style categories showed in Table 36. Students who preferred multimodal learning styles were more achiever on reading.

Table 36

Means and Standard Deviations of RAAF and FT Scores for the Multimodal and Single Learning Style Categories

Gender	Grade	Reading Assessment		S	M
Males	Grade 7	RAAF	*n*	26	74
			M	15.27	17.61
			SD	7.72	6.91
		FT	*M*	41.88	43.91
			SD	7.58	7.14
	Grade 8	RAAF	*n*	26	66
			M	17.65	20.39
			SD	5.16	5.06
		FT	*M*	42.38	43.18
			SD	6.76	6.57
	G 7 & 8	RAAF	*n*	52	140
			M	16.46	18.92
			SD	6.62	6.25
		FT	*M*	42.13	43.56
			SD	7.12	6.86
Females	Grade 7	RAAF	*n*	42	61
			M	22.07	21.26
			SD	3.28	3.57
		FT	*M*	46.83	46.91
			SD	3.74	7.14
	Grade 8	RAAF	*n*	39	65
			M	21.36	21.69
			SD	4.06	3.63
		FT	*M*	45.62	46.42
			SD	4.48	3.97
	G 7 & 8	RAAF	*n*	81	126
			M	21.73	21.48
			SD	3.67	3.59
		FT	*M*	46.25	46.37
			SD	4.14	3.78

Abbreviation Note: S = Single style; M = Multimodal style, RAAF = Reading Achievement Assessment Form, FT = First Term scores

The means and standard deviations of the reading achievement measure scores (i.e., RAAF and FT) for all participants categorised according to their grade and gender are shown in Table 37. Female students achieved higher than male students for both measures.

Table 37

Means and Standard Deviations of RAAF and FT by Grade and Gender

Reading Assessment		Grade		Gender	
		7	8	Male	Female
RAAF	*M*	19.33	20.65	18.26	21.58
	SD	6.04	4.60	6.43	3.62
FT	*M*	44.98	44.63	43.18	46.32
	SD	5.9	5.6	6.92	3.92

Abbreviations Note: RAAF = Reading Achievement Assessment Form, FT = First Term scores

Means and standard deviations for RAAF and FT scores of the high or low reading achievement groups categorised according to gender and their VARK7G learning style preferences are shown in Table 38. Visual students in general achieve higher score in RAAF than students whose preferred other learning styles. In addition, tri modal female students in low group achieve higher scores than other learning styles group in low reading achievement groups female and male.

Table 38

Means and Standard Deviations of High and Low Groups on VARK7G by Gender

Gender	Reading group	Reading Assessment		Learning Styles						
				Quad	Bi	Tri	V	A	R	K
Males	L (n=96)	RAAF	*n*	33	19	12	4	6	8	11
			M	13.03	14.47	11.75	15.50	12.00	10.75	11.21
			SD	3.90	3.93	4.37	2.64	3.28	3.09	3.83
		FT	*M*	36.88	37.63	37.08	35.75	36.33	36.38	39.73
			SD	4.76	5.27	4.33	5.31	4.80	5.34	5.44
	H (n=96)	RAAF	*n*	41	14	21	6	3	5	6
			M	24.41	24.21	22.95	24.67	22.67	23.60	24.17
			SD	.89	1.62	2.15	.81	2.08	1.67	1.32
		FT	*M*	49.15	48.93	48.67	49.50	48.33	50.00	49.17
			SD	1.76	2.12	1.68	1.22	1.52	.00	1.32
Females	L (n=99)	RAAF	*n*	26	19	17	9	7	8	13
			M	16.85	17.26	16.59	17.78	13.86	16.13	15.46
			SD	3.13	2.94	2.69	2.22	3.84	3.60	4.11
		FT	*M*	39.85	39.05	41.53	40.11	37.29	40.50	40.08
			SD	5.21	4.50	2.23	5.01	4.53	3.96	3.88
	H (n=108)	RAAF	*n*	33	25	16	6	7	9	12
			M	24.76	24.96	24.50	25.00	24.57	24.22	24.58
			SD	.61	.20	1.21	.00	1.13	1.39	.99
		FT	*M*	49.00	49.52	49.06	50.00	49.57	50.00	49.58
			SD	1.92	1.63	1.61	.00	1.13	.00	.99

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic, RAAF = Reading Achievement Assessment Form, FT = First Term scores

Multivariate analysis of variance (MANOVA) analyses were used to examine the effect of gender and each of the learning style categories (VARK7G and multi-single) on differences in RAAF scores and FT scores. Separate MANOVA's were also conducted to examine the effect of grade level and learning styles category (VARK7G and multi-single) on reading achievement differences in the male and female subgroups. ANOVA was conducted on each dependent variable as a follow up test to the MANOVA. Post hoc tests were conducted using the LSD procedures to control for type 1 error. Analysis of variance A preset alpha level of $\alpha = .05$ was used for all statistical procedures.

Results of the MANOVA indicated that there were significant difference for gender and grade level, but not for the VARK7G learning style categories in relation to the RAAF scores and FT scores. For grade level, a significant effects was found for the reading achievement variables, Wilks' Lambda $\lambda = .960$, $F(2, 370) = 7.749$, $p < .001$, $\eta^2 = .040$. A The MANOVA also revealed a significant gender effect for the reading achievement variables, Wilks' Lambda $\lambda = .901$, $F(2, 370) = 20.432$, $p < .001$, $\eta^2 = .099$.

There was a significant interaction between the grade and gender factors for the reading achievement variables, Wilks' Lambda $\lambda = .974$, $F(2, 370) = 4.981$, $p < .007$, $\eta^2 = .026$. Also there is significant interaction between gender and VARK7G on the dependent variables, Wilks' $\lambda = .625$, $F(12, 740) = 2.458$, $p < .001$, $\eta^2 = .038$.

The ANOVA result showed a significant gender difference in RAAF scores $F(1, 371) = 40.966$, $p = .001$with small size effect $\eta^2 = .099$. Significant Gender differences were also found for FT scores $F(1, 371) = 26.745$, $p < .001$, $\eta^2 = .067$. A significant effect was found for interaction of grade and gender on the reading RAAF achievement variable $F(1, 371) = 3.971$, $p = .047$, $\eta^2 = .011$. Furthermore the interaction of gender and VARK7G had a significant effect on the RAAF scores $F(6, 371) = 2.395$, $p = 028$, $\eta^2 = .037$. No

significant Post-hoc pair wise compassions were found in relation to the reading achievement variables and the independent variables.

A second MANOVA using gender, grade and multimodal and single learning style categories as the independent variable and the reading achievement scores for RAAF and FT as the dependent variables was conducted. The preliminary results revealed significant multivariate effects for grade Wilks'λ = .947, $F(2,390)$ =10.819, p <.001, η^2= .053. While gender, Wilks' λ = .887, $F(2,390)$ =24.930, p. <.001, η^2 = .013. The interaction effect of the grade level and gender was significant Wilks'λ = .965, $F(2,390)$ =7.127, p<.001, η^2=.035. Furthermore, the interaction of gender and multimodal and single learning styles categories was significant Wilks' λ= .976, $F(2,390)$ =4.759, p <.009, η^2 = .024.

The ANOVA result showed a significant main effect for the RAAF scores between grade levels $F(1,391) = 4.997$, $P = .026 < .05$, η^2= .013. Significant, gender effects were also found for RAAF scores $F(1,391) = 49.984$, $P = .000 < .05$, η^2= .113 and FT scores $F(1,391) = 32.712$, $P = .000 < .05$, η^2= .077.A significant main effect was found for the multimodal and single learning styles on RAAF scores $F(1,391) = 4.431$, $P = .036 < .05$, η^2= .011. The interaction of grade and gender had a significant effect on the RAAF variable $F(1,391) = 6.218$, $P = .013 < .05$, η^2= .016. Also the interaction of gender and multimodal or single learning styles had a significant effect on RAAF $F(1,391) = 6.453$, $P = .011 < .05$, η^2= .016.

MANOVA analysis examines the each gender separately. The result showed no significant effect with female students, while significant effects were found with male students, grade and (VARK7G) category for reading achievement variables. The result showed significant effect for grade level Wilks'λ = .933, $F(2,177)$ =6.380, p<<.002 η^2=

.067. Also VARK7G showed a significant effect Wilks'λ = .888, $F(12,354) = 1.801$, $p < .047$ $\eta^2 = .058$.

ANOVA result showed significant effect for the grade level only on the RAAF score, $F(1,178) = 4.015$ $p = .047 < .05$ $\eta^2 = .022$.

Post hoc analyses of the MANOVA consisted of finding the differences between the subgroups of learning style. The male student participants reported a significantly lower number of errors between learning style subgroups in RAAF. There were significant differences within the male sample between Quad style and Read/write style (P = .049), between Quad style and Kinaesthetic style (P = .007), between Tri style and Kinaesthetic style (P = .031), between the Visual style and Read/write style (P = .041), and between Visual style and Kinaesthetic style (P = .014).

MANOVA analysis furthermore, examines male student, grade and learning style (multi-single) category on RAAF scores and FT scores. The significant multivariate effect were found for grade Wilks'λ = .909, $F(2,187) = 9.404$, $P < .000$ $\eta^2 = .091$. Also the significant multivariate effect for multimodal and single learning styles categories Wilks'λ = .960, $F(2,187) = 3.884$, $P < .022$ $\eta^2 = .040$.

ANOVA results showed a significant effect between grade and RAAF scores, $F(1,188) = 6.500$, $P = .012 < .05$ $\eta^2 = .033$. A significant effect was also found between learning style categories (multimodal and single) and RAAF scores $F(1,188) = 6.273$, $P = .013 < .05$ $\eta^2 = .032$.

Research question 3

Chi-square analyses were conducted to examine the difference between gender on learning styles (multimodal or single and VARK7G) in this question. Table 39 shows the frequency and percentage of student in each group of learning style.

Table 39

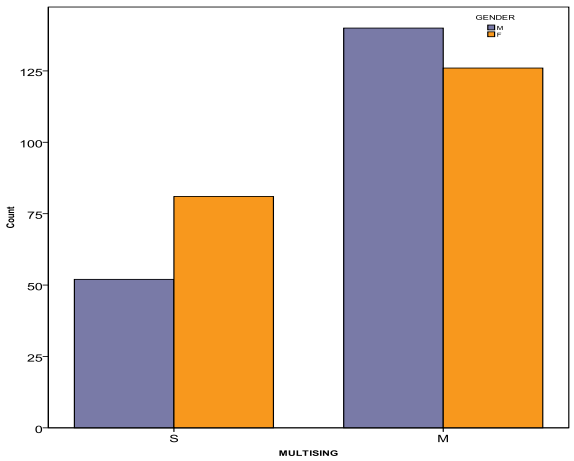
Frequency and Percentage of Each Gender Categorised According to Learning Styles Preference

Genders		Learning style preferences								
		Quad	Bi	Tri	V	A	R	K	M	S
Males	f	74	33	33	10	9	13	20	140	52
	%	38.5	17.2	17.2	5.2	4.7	6.8	10.4	72.9	27.1
Females	f	55	43	28	18	11	23	29	126	81
	%	26.6	20.8	13.5	8.7	5.3	11.1	14	60.9	39.1

Abbreviations Note: Quad = quad style; Tri = tri style; Bi = bi style; V = visual; A = aural; R = read/write, K = kinaesthetic; S = Single style; M = Multimodal style

The result indicated a significant relationship between gender and learning style (multimodal or single) $\chi^2(1, N = 399) = 6.51$, $p = .01 < .05$. The association was of small strength $\phi = .128$ and gender accounted 1.6 % of the variance in learning style. Figure 23 shows the distribution of the gender in learning style (i.e., multimodal, single).

Figure 23. Gender percentage for single and multimodal learning styls

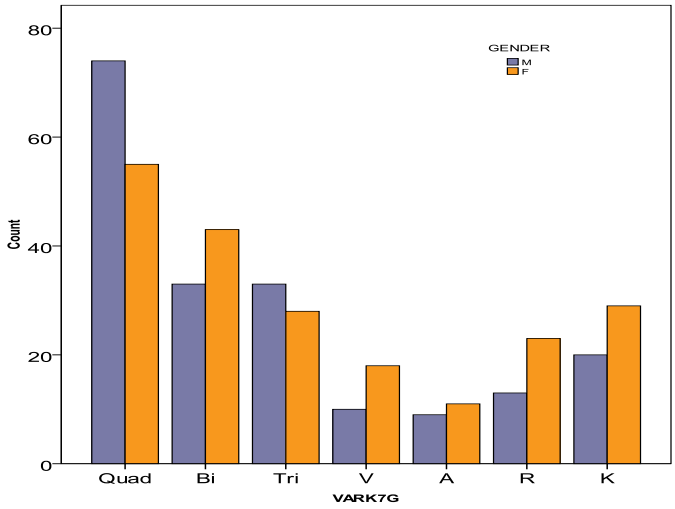


In general, the information that is given in the column graph shows that more male students preferred to use a multimodal learning style than single learning style. In contrast, while the majority of females also showed a preference for multimodal learning styles,

from the group of students who preferred the single learning style, a greater number were female.

In VARK7G the result of showed there is no relationship between gender and learning style VARK7G $\chi^2(6, N = 399) = 10.89, p = .09$. The association was of small strength $\phi = .165$ and the gender accounted 2.7 % of the variance in learning style. Figure 24 shows the distribution of the gender in seven subgroups learning style (VARK7G).

Figure 24. Gender percentage for VARK7G categories



The majority of students in both genders preferred quad style, whereas the aural style was least preferred for male and female student. The graph also shows the number female student exceed male students in bi, visual, aural, read/write and kinaesthetic styles.

Research question 4

The relationship between the teaching reading strategies used by teachers in Arabic reading classes and a student's achievement in reading was examined in question four. Data was gathered from 16 Arabic teachers who completed the TRSQ teacher form and used the RAAF to evaluate the reading skills of their students. Teachers also provided the researcher with student scores on the first exam FT. Correlation was the statistical technique used to investigate the relationship between the subscale scores of the TRSQ and

reading achievement scores for both the RAAF and FT. According to Lomax (2001) the sign (+, -) of person coefficient in the result of the correlation indicates the direction of the relationship. The range of this relation is between -1 to +1. Also, he indicates that the value of this relationship would be strong when the result draws near 1 positive or negative, on the contrary the relationship be weak when the result resorts to zero.

Correlations between students reading achievement (RAAF and FT) and subscales of TRSQ are shown in Table 40. A small positive correlation was found between reading achievement RAAF and RR, $r = .28$, $p < .001$. Another small positive correlation was found between RAAF and RA, $r = .14$, $p < .01$. In addition a negligible negative correlation was found between RAAF and RI, $r = -.10$, $p < .01$. No significant associations were found between reading achievement RAAF and the DR and AS subscales of teaching reading strategies.

The relationships between students reading achievement FT and teaching reading strategies was examined and correlations shown in the Table 40. A small positive correlation was found between reading achievement FT and RR, $r = .21$, $p < .001$. Similarly, a small positive correlation was found between FT and RA, $r = .18$, $p < .01$. A negligible negative correlation was found between FT and RI, $r = -.10$, $p < .01$. On the other hand there was a no significant correlation between reading achievement FT and the two subscales of teaching reading strategies DR and AS.

Table 40

Correlation Between Students' Reading Achievement and the Teachers' TRSQ Form

	RI	RR	RA	DR	AS
RAAF	-.10*	.28**	.14*	-.01	.06
FT	-.10*	.21**	.18*	.01	.06

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment. RAAF = Reading Achievement Assessment Form, FT = First Term scores $p<.05$ *, $p<.01$**

Research question 5

In the fifth research question, the researcher examined the predictive characteristics of the five subscales in the TRSQ questionnaire student form in relation to reading achievement. The TRSQ comprises the following subscales: reading instruction (RI), reading resources (RR), reading activities and behaviour (RA), development of reading comprehension skills or strategies (DR) and assessment (AS). These subscales are the independent variables which affect the dependent variables of reading achievement (RAAF and FT).

Hierarchical multiple regression analysis was used to determine if the teaching reading strategies significantly predicted RAAF reading achievement scores. All steps accounted 56.7 % of the variance in RAAF (see Table 41).

Table 41

Hierarchical Multiple Regression Analyses for RAAF

Model Variable	β	R	R^2	Adjusted R^2	R^2 Change	F Change	Sig F Change
RI	-.11*	.109	.012	.009	.012	4.772	.030
RR	-.03	.117	.014	.009	.002	.701	.403
AR	-.20**	.169	.029	.021	.015	6.087	.014
DR	.14*	.221	.049	.039	.020	8.306	.004
AS	.08	.232	.054	.042	.005	2.116	.147

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment. *p*<.05 *. p < .01**,

ANOVA results revealed that a significant final model emerged (F 5,393 = 4.464, P < .001). Three of five independent variables entered at the final model had a significant impact on RAAF. Only RR (t = -.589, P = .55) and AS (t = 1.455, P = .14) did not significantly contribute to the prediction of RAAF. The variable of development of reading

comprehension skills or strategies contributed 2 % of variance and the inclusion of reading activities lead to an additional 1.5 % of explained variance. Reading activities was the strongest predictor of RAAF (β = .20).

Hierarchical multiple regression analysis was also used to determine if the TRSQ subscales significantly predicted student reading achievement as assessed by FT. Alls steps accounted 51.7 % of the variance in FT (see Table 42).

Table 42

Hierarchical Multiple Regression Analyses for FT

Model Variable	β	R	R^2	Adjusted R^2	R^2 Change	F Change	Sig F Change
RI	-.13*	.108	.012	.009	.012	4.723	.030
RR	.04	.111	.012	.007	.001	.261	.609
AR	-.17**	.157	.025	.017	.012	4.949	.027
DR	.14*	.207	.043	.033	.018	7.424	.007
AS	.03	.209	.043	.031	.001	.331	.565

Abbreviation Note: RI= Reading Instruction; RR= Reading Resources; RA= Reading Activities; DR= Development of Reading comprehension skills; AS= Assessment. *p*<.05 *, p < .01**,

ANOVA revealed that a significant final model emerged (F 5,393 = 3.572, P < .004). Three of five independent variables entered at the final model had a significant impact on FT except RR (t = .670, P = .50) and AS (t = .576, P = .56). The inclusion of development of reading comprehension skills or strategies resulted 1.8 % of variance and the inclusion of reading activities lead to an additional 1.2 % of explained variance. Reading activities was the strongest predictor of FT (β = .17).

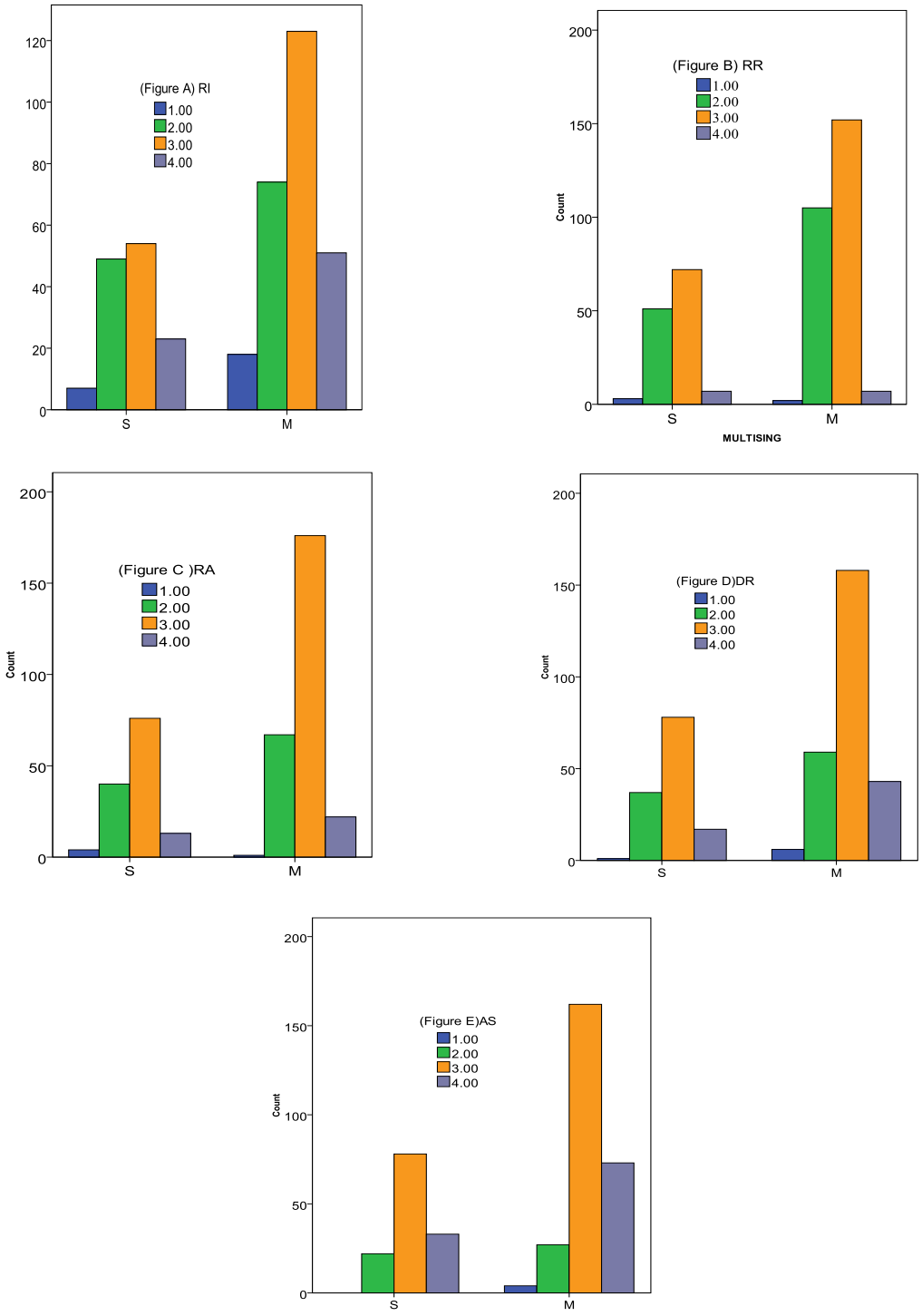
Research question 6

For this question chi square analysis was used to investigate contrasts between the student responses regarding their preferences for the use of the five subscale teaching

reading strategies examined in the TRSQ according to their preferred learning style strategy. Comparisons were completed for both the multimodal-single learning style categorisation and the VARK7G categorisation. In the multimodal and single group categorisation contrast of the TRSQ subscale scores, no significant associations were found between the reading strategy preference groups in relation to their preferred learning style. The chi square result for multimodal or single learning style preference and RI use preference was, $\chi^2(3, N = 399) = 3.466$, $p = .325$. The association was negligible, $\phi = .093$, with RI accounting for only .86 % of the variance in learning style preference. Figure 25 (A) shows the distribution of student multimodal and single learning style preferences according to their responses on the RI subscale. No significant association was found between multimodal or single learning style and RR subscale scores, $\chi^2(3, N = 399) = 3.522$, $p = .318$. The association was negligible, $\phi = .094$, and RR accounted for .88 % of the variance in learning style preference. The distribution of multimodal and single learning style preferences according to students' responses on the RR subscale are shown in Figure 25 (B). Furthermore, no significant association was found between the multimodal or single learning styles groups student in RA $\chi^2(3, N = 399) = 7.061$, $p = .070$. The association was small, $\phi = .133$, and RA accounted for 1.7 % of the variance in learning style preference. Figure 25 (C) shows the multimodal and single learning style distribution for the RA subscale. Likewise, no significant relationship was found between the multimodal and single learning styles categories and the DR subscale, $\chi^2(3, N = 399) = 2.998$, $p = .392$. The association was small, $\phi = .087$, and DR accounted for .8 % of the variance in learning style preference. Figure 25 (D) shows the multimodal and single learning style distribution for the DR subscale. Similarly, no association was found between learning style (multimodal or single) groups and the AS subscale, $\chi^2(3, N = 399) = 5.255$, $p = .154$. The association was small, $\phi = .115$, and AS accounted for 1.3 % of the

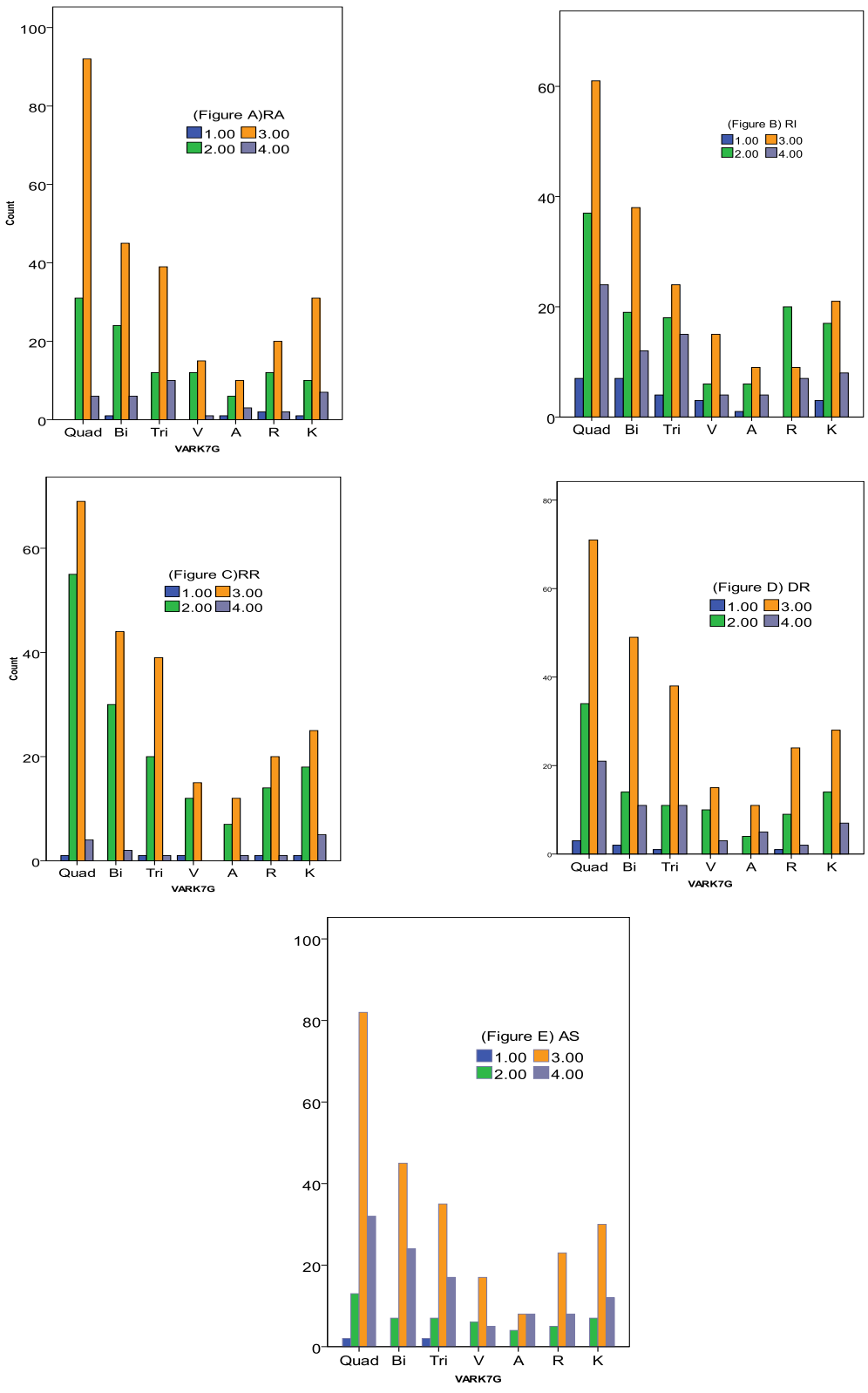
variance on learning style preference. Figure 25 (E) shows the multimodal and single learning style distribution in AS.

Figure 25. Distribution of students' single and multimodal learning styles on TRSQ



VARK 7G chi-square results revealed a significant association between VARK7G learning styles and RA, $\chi^2(18, N=399) = 30.107$, $p < .05$. The association was small, ϕ = .275, and RA accounted for 7.6 % of the variance in learning style preference. Figure 26 (A) shows the distribution of student groups in VARK7G learning styles according to their responses on the RA subscale. Whereas, the chi-square test between VARK7G and RI, RR, DR and AS revealed no significant association; for RI, $\chi^2(18, N=399) = 20.347$, p = .314. The association was small, ϕ = .226, and RI accounted for 5.1 % of the variance on learning style preference Figure 26 (B) shows students learning style VARK7G distribution in RI. Chi-square for RR, $\chi^2(18, N=399) = 14.357$, p =.705. The association was small, ϕ = .190, and RR accounted for 3.5 % of the variance on learning style preference. The distribution of student learning style VARK7G according to the responses in RR are shown in Figure 26 (C). Furthermore, there was no significant association between VARK7G groups and DR, $\chi^2(18, N=399) = 12.617$, p = .814. The association was small, ϕ = .178 and DR accounted for 3.1 % of the variance on learning style preference. Figure 26 (D) shows the student learning style in VARK7G distribution in DR. Result shown no significant association between VARK7G and AS $\chi^2(18, N=399)$ = 15.059, p = .658 The association was small, ϕ = .194 and SA accounted for 3.7 % of the variance on learning style preference. Figure 26 (E) shows the student learning style distribution in AS.

Figure 26. Distribution of students' learning styles VARK7G on TRSQ.



Discussion

In the first phase of the study, teachers' assessed students using the RAAF and FT. Data were collected and analysed and the student sample classified as either high or low achievers in reading. The learning style preferences of students were determined according to their responses to the VARK. In addition, the responses to the TRSQ (students form) were collected to establish the preferred teaching strategies of the students sample. The responses for the TRSQ for teachers were also collected. The data were subjected to quantitative analysis to evaluate differences in learning style preferences between students classified as high or low in reading achievement. The key findings are discussed under the following themes:

1 - Predominant learning styles preferences;

2-Learning styles and reading achievement;

3- Gender and learning styles;

4- Teaching strategies and reading achievement;

5-Student preferred teaching reading strategies and reading achievement;

6- Student preferred teaching reading strategies and learning styles.

Predominant learning styles preferences

Descriptive statistics, including frequencies, percentages and chi square comparisons between high and low groups were determined to address research question one. The multimodal and single VARK group comparison showed that the multimodal learning style was preferred by both the low and high reading achievers in the sample. This indicates that the majority of students in this study demonstrate a preference to use more than one style when they learn. This pattern was clearer in the VARK7G results which showed the quad, tri and bi styles were the preferred styles for both reading achievement

groups. The results indicated that the quad learning style was the prevailing style for both reading groups. The aural style was the least preferred style for both reading groups.

The current finding regarding the students' preference for multimodal learning is consistent with previous research (e.g., Ricca, 1984; Reese et al., 2008). It is important to note, however, that these studies did incorporate different learning styles measures. Ricca (1984) used Dunns' theory as the basis for the evaluation of the learning style characteristics of high and low academic achievers. She found that both gifted and general program students used more than one style. The groups demonstrated preference for mixed learning styles that included the visual, auditory and mobility sub-factor learning styles. Reese et al. (2008) also found that high and low GPA achievers preferred more than one style to absorb the information. Reese et al. also noted low GPAs achievers preferred an environment with bright light, sound or conversation. This suggests that the visual and aural learning style may be a useful way to teach low achievers. Hlawaty (2008) used Dunn's inventory and reported that high and average academic achievement students preferred mobility sub-factor, while low academic achievement students need authority and teacher-oriented learning sub-factor. Jackson-Allen et al. (1994) also investigated learning styles preferences using Dunns' inventory. They found low achievers in core academic courses (English, science, history and math) demonstrated lower scores on the motivation sub-factor and higher scores on the mobility sub-factor compared to high achievers in core academic courses who were strongly motivated. In addition, Park (1997a) used the Reid questionnaire and determined the main learning styles for high and low academic achievement. He found that high and low achievers have similar multimodal learning styles preferences for sensory learning styles that included auditory, visual, kinaesthetic and tactile. Kia et al. (2009) used the memletics learning style inventory. They found that social, aural and solitary learning styles were common between students in the

high academic achievement group and, logical and physical styles common in the low achievement group. The results found in the current study showed students in both groups, high and low, preferred more than one learning style. This finding when considered in relation to previous research implies students typically use a variety of the possible learning styles to facilitate the absorption of information.

Findings of this study revealed the kinaesthetic style was the preferred style for the low reading achievement group within the grade seven male and grade eight female samples. This result is consistent with the findings of Jackson-Allen et al. (1994), Littin (2002), Reese et al. (2008), Kia et al. (2009) and Williams (2010), whereby the typical pattern was that most low reading achievers tended towards the kinaesthetic style. The kinaesthetic style is considered to be an important feature in teaching students of preparatory school age, therefore this style should constitute a key component of programs working towards developing the skills of lower achieving students.

The chi square results revealed a significant relationship between high and low reading achievement and learning style preference in the grade 7 male group. This pattern of results is consistent with other researchers who compared educational achievement characteristics and learning style (Collinson, 2000; Kia et al., 2009; Matthew, 1996; Park, 1997a; Reese et al., 2008; Ricca, 1984). They found significant differences between learning styles and the student groups according to their academic achievement. Students in the high group demonstrated a preferences for multimodal style (quad, tri and bi) followed by the visual style as the single style preference. Kinaesthetic and read/write were the preferred styles of the low group, who typically have a lesser tendency to incorporate the visual learning style. Reading in Saudi school is typically provided in the visual domain (textbook with picture). Interestingly, the preference for the quad and tri learning styles, which both include the visual learning style, of the grade seven high

reading achievement group may explain their better scores on the reading skills measures. This is consistent with the finding of Kia et al. (2009), who reported that the visual learning style was the preferred styles for high academic achievers.

Chi square results revealed only one significant comparison between the preferred learning styles of the high and low reading achievement groups and subgroups (i.e., grade 7 males). The current results are consistent with those of Jackson- Allen et al. (1994) who found no significant differences in the auditory, visual, tactile, and kinaesthetic learning styles preferences between students categorised as low or high academic achievers. In addition, the results which were reported by Abdulkadir et al. (2006) highlighted no significant differences in the learning style preferences of students grouped as high and low according to their scores on the Malaysian public education examination. Fox et al. (1999) also found no significant differences between the academic achievement scores of undergraduate students and their learning styles as assessed using the Kolb questionnaire. Roig (2008) found there were no significant differences between the academic achievement scores of biology students grouped according to their learning styles on the Felder – Soloman learning styles inventory. Furthermore, Roig's (2008) reported the students preferred the sensing, visual and sequential learning styles. The current results clearly demonstrated that the quad learning style was the predominant learning style for both grade and gender. Tri and bi learning styles typically followed the quad style with a variation in order of preference between the reading achievement groups. However, overall on the basis of the current findings and similar learning styles research it could be surmised that learning styles is not a characteristic that could be used to differentiate between low and high achieving students in reading, or indeed in other areas of academic achievement.

Learning styles and reading achievement

A key area of focus for the study was to identify if differences in learning style preference existed between groups categorised according to their reading achievement level. For this reason a MANOVA and ANOVA were both applied to compare the responses of male and female students from grade seven and eight with regard to the VARK and reading achievement (RAAF and FT).

The MANOVA result indicated that female students scored significantly higher than male students on reading achievement. This finding is consistent with the results of Johnson (1973) who found that girls in Canada and the United States achieve better than boys in reading. Lokan et al. (2001) also discussed differences between male and female students in reading achievement. They found female students achieved higher reading test results in Korea, Latvia, Finland, New Zealand, Norway and Australia. Furthermore, studies by Alloway et al. (2002) and Grigg et al. (2003) highlighted the higher achievement of girls in reading. In addition, White (2007) also found significant differences between genders in reading achievement that favoured female students. The current finding in association with the results from the previous set of studies reinforces the pattern that girls achieve better than boys in reading (Zambo et al., 2008). While most researchers explained this difference between genders as an outcome of biological differences, differences in the current research may be due to a specific cultural affect. The restriction of girls' involvement in range of activities such as sport in Saudi society may give girls more chance to read than boys and therefore facilitate the opportunity to achieve higher results in assessment of reading skills.

The current study found no direct effect of learning styles classification (i. e., VARK7G and multimodal or single VARK group) on reading achievement, whereas a significant effect existed for the interaction of gender and learning styles (i. e., VARK7G

and multimodal or single) on reading achievement (RAAF). Females with a visual learning style preference demonstrated higher scores on RAAF compared with other females with other learning style preferences in the high group. Furthermore, male students with a visual learning style preferences in both the high and low groups and female students with a visual learning style preference in the low group demonstrated higher levels of reading achievement scores than students from the other learning style preference groups within their respective reading achievement groups. Reading resources in Saudi schools typically consist of books with pictures to supports the text ideas. This type of presentation could better serve the needs of visual students rather than students with other style preferences. This result is consistent with Carbo (1983) who reported significant differences in learning style preference between low and high achievers in reading skills. Carbo's study was based on Dunns' theory and utilised an elementary school sample. She reported different learning style preferences for each reading group. She also reported that visual students demonstrated higher achievement in reading. Clyne (1984) reported a relationship between reading achievement and the sub-factors of responsibility and noise level from Dunns' learning styles inventory within a sample of Alaskan native students. Furthermore, Caldwell et al. (1996) studied the relationship between learning styles using Dunns' inventory and reading achievement for third and fourth grade students. The result showed significant differences between high achieving readers and low achieving readers. This was supported by Foley (1999) who also found evidence that supports the effect of learning style preference on reading achievement. The results showed statistically significant differences between low and high performing students in their reported learning style preferences. Students in the high achieving group showed a greater preference for the sub-factors persistence and responsibility. Littin (2002) reported a significant positive correlation between reading achievement in the high achieving group and persistence,

intake, late morning, and work with teacher sub-factors of Dunns' inventory and a negative correlation between reading achievement and early morning and external motivation sub-factors. Williams (2010) also found significant differences between students grouped according to their reading achievement in relation to auditory kinaesthetic and visual learning styles.

The significant association between learning style preference and reading achievement found in the current study result is consistent with previous research. Virostko (1983) assessed the preferred time of day learning style sub-factor in relation to reading with two student groups from grade three and four. One group studied reading when reading was scheduled at times preferred by them, the other group studied reading at a scheduled time that was a mismatch with their preferred time. The study found a significant effect for time of day learning style preference on reading achievement. Students who studied at the time they preferred achieved greater results in reading than those who did not. Furthermore, MacMurren (1985) found a similar effect for the intake learning style sub-factor on reading achievement. Forty students from grade six who had high or low preferences for the intake element on Dunns' inventory were divided randomly into two experimental groups. One group studied reading with an intake environment while the others studied without. Significantly higher reading achievement was reported for students whose intake sub-factor learning styles preference matched the intake environment in both groups. Lashell (1986) investigated the effect of teaching reading to disabled students' at the elementary school level according to their specific learning styles. The Gry Oral Reading Test was used to assess students' progress in reading. This test provides an objective measure of oral reading skills. The results showed an increase in reading achievement in the experimental group three times more than the students in the control group in one school year. In addition, Brooks (1991) examined the effect of

learning style preference on oral and silent reading and listening comprehension. The sample consisted of students who attended a remedial reading program. They were divided into control and experimental groups. Learning styles for both groups were determined by a reading styles inventory. Each student in the experimental group was taught according to their learning style preference (kinaesthetic, visual or auditory) while students in the control group did not receive reading instruction based upon their learning styles preference. The results showed students in the experimental group achieved significantly higher results than students in the control group. Although congruence between teaching style and learning style has an important role in reading achievement improvement other important factors should not be ignored. These factors include student levels of intelligence and parental levels of education.

Separate MANOVA's for each gender in relation to reading achievement, and learning style preference determined no significant differences for female students, whereas male students' demonstrated significant differences in reading achievement (RAAF) according to their grade and preferred learning style. In general, school students continue to develop their reading skills as they progress to higher grades. The results also showed significant differences in reading achievement (RAAF) according to learning style preferences (VARK7G and multi-single). The current results provided evidence that highlighted male students were distributed across VARK learning styles. The post hoc analyses showed the quad male students achieved higher results on RAAF than male students whose preferred the learning styles of read/write and kinaesthetic. In addition students who preferred tri style achieved better results than kinaesthetic students on reading achievement (RAAF). Visual students also scored higher on the RAAF than the read/write and kinaesthetic students on RAAF. Students with a visual learning style demonstrated higher scores in reading achievement than those with preference for

read/write style. This could be attributed to an increase in the use of visual technology such as T.V, computers and the Internet. According to Griffin and Schwartz (1997):

> While young people today may be less inclined to read and thus less verbally literate than the previous generation, it has become a cliche that they are more visually facile and skilled. This increased visual literacy is attributed to children's copious exposure to and experience with television, video games, and computers (p. 41).

The higher achievement obtained by students who prefer tri learning style could support the previous finding since visual learning style could be one of the tri styles. As the visual learning style is one of the quad learning styles, the quad males have also achieved higher results in RAAF than those with a preference for read/write or those with a kinaesthetic learning style.

The current findings indicate that knowledge concerning students' learning styles has an important role in the management of classroom instruction. Incorporating a learning styles focus within reading classes may improve students' reading abilities by providing instruction that is better suited to students learning style preferences. National curriculums and education administrators need to provide teachers with guidance to address learning styles preferences within their lesson plans.

Gender and learning styles

The relationship between gender and learning styles was investigated in this study. For this purpose, frequency and percentage of each gender with the various learning style preference categories (VARK7G and multi-single) were determined and chi-square analyses conducted to examine the preference patterns for each gender. In the VARK multimodal and single groups, there were a greater number of males and females who preferred to utilise a multimodal learning style. In VARK multimodal and single categories

female students were more likely to prefer single styles than male students. The finding of this study is consistent with Wehrwein et al. (2007) who used the VARK adult questionnaire (old version 13 questions) to categorise their sample within similar categories to the current study. Wehrwein et al. reported a varied set of results for both genders in relation to the VARK learning styles categories. Female students in the current study showed more of an inclination towards single styles than males which is supported by the Wehrwein et al. finding, despite the differences in the sample age and the version of the VARK. According to this study finding and Wehrwein et al. female students appear to demonstrate a preference for the single learning styles.

The current study result, however, was inconsistent with the finding of Isman et al. (2009) who reported that female students preferred multimodal learning styles while male students preferred single learning styles. The Isman et al. study used the same questionnaire that was used in the Wehrwein et al. (2007) study. Bernardes et al. (2009) findings were also consistent with Isman's conclusion based on the use of a different version of VARK. They reported significant differences in the learning style preferences of male and female students completing an operations management class.

Chi-square results revealed statistically significant differences in learning style preferences between male and female students in the multimodal and single VARK groups. This result is consistent with Philbin et al. (1995) who found significant differences between males and females on the Kolb inventory. They indicated greater numbers of females were distributed across diverger and converger learning styles, while a greater number of male students preferred the assimilator style. Honigsfeld et al. (2003) investigated the differences in learning style preferences between genders across four countries. They reported significant differences between genders in the general sample, and they also found significant differences for the interaction of country by gender.

Further, Mammen et al. (2007) found that the learning styles of male and female surgery residents were significantly different. Dobson (2009) reported a significant chi-square difference between genders on the VARK learning styles questionnaire. Can (2009) found that male and female student teachers differed significantly in their learning styles preferences. The difference between males and females was reported as significant by Lu et al. (2010). The result of the present study and the previously mentioned studies suggest that learning style preference is influenced by an individual's gender.

In the current study the quad learning style was the category of the VARK7G learning style classification that was the predominant preference of both male and female students. Male students however, showed a marginally higher preference for the quad style. Male students also demonstrated similar levels of preference for both the bi and tri styles, whereas females preferred the bi style more than tri style. The current result was supported by the Wehrwein et al. (2007) study that detailed that males preferred the quad style more than females. These results generally indicated that females tend to use fewer learning styles when they learn.

Kinaesthetic style was one of the preferred styles for female students. The current finding also supported Wehrwein et al. (2006) who found that the kinaesthetic style was the preferred single style for female students. Park (1997a) also reported that a female has a stronger preference for the kinaesthetic style than males. Park's sample involved different ethnic groups and he used Reid's learning styles questionnaire. He indicated that females indicated higher preferences for the kinaesthetic learning style across different ethnic groups. The current result is inconsistent with Dobson (2009) who found that the kinaesthetic learning style was the least preferred by both genders. However, the male students in his study demonstrated a slightly higher preference for the kinaesthetic style. This could be attributed to the nature of the subject in his study which was physiology.

Furthermore, the results of the current study indicated that the read/write learning style was the second most preferred single style for both genders, furthermore, female students had greater preference for this style than males. This finding is supported by Slater et al. (2007) who reported that read/write was the second most preferred style for medical students and that female students preferred this style more than male students. The current study's finding was inconsistent with the results of Lincoln et al. (2006) who used the VARK to exmine learning styles of adult English as second language students. Lincoln et al. reported that the read/ write learning style was the preferred style for male students. This difference could be attributed to differences in the version of the VARK used and differences between the samples. The Lincoln et al. study sample consisted of ethnically diverse students also included older students whose ages ranged from 23 to 45 years.

The current study found that female students demonstrated stronger preferences for visual and aural learning styles. This result is consistent with Slater et al. (2007) who used the VARK and found that female students in their first-year of medical studies had a greater preference for the visual learning style. Further, Ramayah et al. (2009) also used the VARK and reported that female students preferred the visual and aural learning styles more than males in the sample. The current result was inconsistent with Dobson (2009) who divided the student participants into four categories according to VARK theory. He reported that visual style was the preferred single style for both females and males, and that males preferred the visual learning style more than females. The current study highlighted that female students in Saudi preparatory schools preferred visual information more than males.

Aural learning style was the least preferred for both genders particular in male group. This result is consistent with Slater et al. (2007) who reported that the aural learning style preference was selected as the last preferred learning styles for students in the first

year of medical school. This study result is inconsistent with Dobson (2009) and Ramayah et al. (2009) who found that the aural learning style was one of the most preferred learning styles for graduate students. According to the current results, Saudi schools could benefit from reducing their reliance on aural teaching methods in reading classes.

Saudi female students' inclination towards the kinaesthetic style was one of the most interesting findings considering the unique culture in this country. This preference of female students for the kinaesthetic style could be due to the age characteristics of students in the preparatory stage. This school stage encompasses the beginning of adolescence. Physical movement is considered as one of the important developmental characteristics for the adolescent. Restrictions in opportunities for physical activity may affect girls learning behaviour. Furthermore, this preference for the kinaesthetic learning style in the female group may be considered as the reaction for cultural control on females. This cultural restricts girls' practice and movement activities inside and outside schools.

The significant chi-square differences between genders in the multimodal and single VARK groups comparison were not replicated when chi-square was used to examine differences in relation to the VARK7G. This result was also consistent with Slater et al. (2007) who found no statistical differences between male and female undergraduate students on the basis of their VARK responses. Alkhasawneh et al. (2008) also used the VARK learning styles questionnaire and reported no significant differences in learning style preferences between male and female nursing students. Paul et al. (1994) also reported no significant differences in learning style preferences on the basis of gender among undergraduate students in AUE.

It can be concluded that, gender is indeed significantly related to learning style preference particularly in relation to the sensory learning styles. This sensory preference may develop in an individual due to factors such as biological and physiological

differences between male and female students (Maubach et al., 2001). Also, this variation in sensory learning style preference between males and females could be attributed to social traditions and education systems which treat gender groups differently.

Teaching strategies and reading achievement

Relationships between the teaching of reading strategies used by teachers in Arabic reading classes and a students' achievement in reading were examined in question four. A small positive association was found between RI and both RAAF and FT, which perhaps reflects the realities of teaching reading in Saudi preparatory schools. This result supports earlier studies that examined the effect of the reading teaching method on reading achievement and highlighted the effectiveness of these methods on reading achievement. Share et al. (1984) reported a strong correlation between phonic strategy and reading achievement. Kilcrease (1989) also indicated significant differences in reading achievement scores for students who were taught using a phonic approach as the reading teaching strategy. Furthermore, several researchers examined the whole language as another reading teaching strategy. For example, Clays (1990) found in his longitudinal study that, students who were taught by the whole language strategy achieved higher reading scores than students who were taught by a more traditional strategy. Also Azwell (1989) found increased reading scores for students in grade three, four and five after they were taught reading by a whole language strategy. This indicated that reading strategies such as phonemic and whole language have a significant impact on reading achievement.

The reasons for the weak relationship between the RI and student reading achievement in this study could be attributed to the strategies followed by the institutions that certify languge teachers. These institutions usually foucus on preparing teachers to teach other element of language rather than reading. In addition, teaching reading in Saudi schools depended on teacher discretion not on specific strategies. Furthermore, reading

teachers in Saudi schools used teaching methods that are characterised as stereotypical or routine methods. This is supported by Shehateh (1997) who found that 75% of Arabic teachers used routine methods to teach reading. Yones (2001) also described the methods used to teach reading in Arabic as automatic.

A small positive correlation was found between RR and the reading achievement (RAAF and FT) of the Saudi students. This result is consistent with most studies which investigated the effect of different resources on reading achievement (e.g., Agee et al., 2009; Reis et al., 2005; Sullivan, 1989; Talley, 1994). Each study explored a different type of resource such as high interest books, computers, and CD-ROM storybooks. They recommended these as the best tools for improving students reading achievement. I believe it is important for educators to consciously manage the type of resources they employ and to ensure they have a good understanding of their students' learning styles.

There are several possible reasons for the weak association between variables. Firstly, reading teachers in Saudi schools typically relied on one book for the teaching of reading, because they often considered reading to be an additional subject and may not have clearly understood its purpose in the overall educational development of students (Alaed, 1998). Secondly, most Saudi schools operate within a very basic educational environment with more than 60% of them operating in rented non-school based buildings (Alotibi, 2005; Al-Zamel, 2008). These types of learning environment may limit teachers' use of a broader range of reading resources and also lack educational technology facilities. Thirdly, rapid population growth in Saudi Arabia has forced school officials to place large numbers of students in each class. This increase in class sizes along with a shorter weekly time allocation for the teaching of reading has become problematic. This argument is supported by the finding of Al-Ajami (2004) who suggested that the number of students in the classroom was the a key reason for lower use of computers when teaching students in

Saudi schools. Fourth, less than one hour per week is an insufficient time allocation to teach reading. All these reasons may have forced teachers to use only school books to teach reading and this may have affected students' reading achievement.

Results also highlighted a small positive correlation between RA and both RAAF and FT in Saudi schools. This result is supported by previous studies (e. g., Christopher 1991; Lawrence et al., 2011; Monda 1989) that investigated the effect of reading class activities such as writing, reading aloud and classroom discussion on students reading achievement. They found that those activities had a significant effect on reading achievement.

The weak association between variables in this study reflected the lack of reading activity in classrooms in Saudi schools. This activity was described by Yones (2001) as starting with the teacher reading then students reading in order. Taimah (1999) also described the activities in reading lessons as being limited to silent reading and clarification of new words. These descriptions of the typical reading lesson, are still representative of the limited activities used in Saudi schools when teaching reading. Teaching reading without targeted innovative and engaging activities may not adequately meet students' needs and could affect their reading achievement.

No significant association was found between DR and reading achievement (RAAF and FT). Similar results were also shown for the relationships between AS with RAAF and FT. DR is based on other reading strategies such as RI, RR and RA. These elements are important in developing students' reading comprehension. As a result of teachers underutlising the strategies of RI, RR and RA, reading classes in Saudi schools could negatively affect the development of the reading comprehension skills of the students. According to Shehateh (1996) and Al-Atheeqi (2009) Arabic reading is often taught using

limited methods in Saudi schools with teachers disregarding the reading skill of comprehension.

Furthermore, there was no association between the AS and RAAF or FT. This lack of association was due to the type of assessment in Saudi schools, namely the final examination. The reading exam used in Saudi schools may not be able to adequately determine the reading performance of learners. According to Al-Atheeqi (2009) the exam depended on the students memorising the questions that followed each reading lesson. The result of this assessment does not provide an accurate picture of reading skills and the information from this assessment is not very useful in developing a reading curriculum or making teaching decisions.

Student preferred teaching reading strategies and reading achievement

In the fifth research question, the researcher examined the predictive characteristics of the five subscales in the TRSQ questionnaire student form in relation to reading achievement. Hierarchical multiple regressions were carried out to determine if the subscales of TRSQ students form significantly predicted reading achievement (RAAF and FT). The regression analyses showed that 19 % of variance in RAAF, and 17 % variance in FT were explained by reading class activities (RA) subscale. The current result is consistent with previous studies that investigated the relationship between reading class activities and students' reading achievement. Monda (1989) and Elley (1989) found a correlation between students' reading achievement and reading aloud as the main activity in reading class. Furthermore, the studies of Christopher (1991), Rundle-Schwark (1992) and Hamby (2004) indicated that writing activities in the reading class also supported improvement in students' reading achievement. Classroom discussion activities have also been shown to have a positive effect on reading achievement (Foertsch, 1992; Lawrence et al., 2011). Reading class activities such as reading aloud, writing and discussion cater for

different styles of learning. These types of activities should be a part of the reading class, because the activities' may better match students learning styles.

Development of reading comprehension skills or strategies (DR) explained the second largest portion of the variance of students' reading achievement (RAAF and FT). Reading comprehension is the cornerstone of reading and is based on vocabulary and fluency (Curtis et al., 2001; Pikulski et al., 2005). To improve students' reading comprehension, teachers should be teaching vocabulary and fluency in reading class. The link between reading achievement and reading comprehension was supported by McKeown et al. (1983) who reported a strong correlation between teaching vocabulary and reading comprehension. Wixson (1986) also supported the relationship between vocabulary and reading comprehension. She suggested that teaching new vocabulary has a positive effect on students reading comprehension. Furthermore, the effect of fluency in reading comprehension was examined by Jenkins et al. (2003). They reported a strong correlation between fluency and reading achievement. Therefore, a focus on vocabulary and fluency in Saudi schools could assist in the development of students' reading comprehension which may then help students to achieve higher scores in reading achievement.

Overall, several factors may affect the TRSQ in predicting reading achievement. The average age of students was between 12 and 15 so their educational experience may not enable them to determine which teaching reading strategies and reading resources are best suited to developing their own reading achievement. Furthermore, the limited reading activities in Saudi schools may not give students a chance to ascertain which reading activities best fit with their ability. Reading is considered to be a minor subject in Saudi schools and the use of traditional methods to teach reading is common, which may limit the development of reading comprehension.

Student preferred teaching reading strategies and learning styles

The relationship between the components of the students' preferred reading teaching strategies and their preferred learning style was examined. Chi-square statistical techniques were used and the results showed no significant associations between students' learning styles groups (multimodal or single VARK groups and VARK7G) and their responses on RI subscales. This finding supported results reported by Davidson (2000) that indicated that the interaction between teaching methods and students learning styles was not significant. Furthermore, the current results sustain Jackson's (2001) finding that there is no interaction between traditional instructional methods and the learning styles of microbiology students. The current result is inconsistent with that of Isom (1997) who found a statistical interaction between teaching methods (lecture-discussion and case study- discussion) and students' learning styles. Olson (2000) also reported a significant relationship between collaborative teaching methods and the two dimensions of the Gregorrc Styles Delineator. Oslon's finding is contrary to results of the current study. Other conflicting findings were reported by Alkhasawneh et al. (2008) whose results showed a significant correlation between problem-based learning teaching methods and students' learning styles assessed in accordance with VARK theory. These conflicting results may be due to the methodological differences such as different teaching methods in different educational fields were investigated, different learning style measurements were used to examine the relationship, and their was substantial differences in the age range of the samples between thestudies.

There were no significant associations between the students' learning styles groups (multimodal or single VARK groups and VARK7G) and their responses to the RR subscale. Lashell (1986) found, however, that the reading achievement of forty seven disabled students increased when taught using reading resources such as recorded stories,

audiovisual materials, books from different types to match their learning styles. Lashell, also said that linking reading resources and students' learning styles was an active factor in improving their achievement. The current results also conflict with the findings of Schuchardt (1987) who used reading materials that matched students' learning styles. Schuchardt reported that two students classified as below their grade level in reading, and were then taught using reading resources (e.g., recorded book, audiovisual materials, random house books and reading lap) that matched their learning styles. achieved better scores in a subsequent reading post-test. The current study investigated the students' preferred reading resources in accordance with their preferred learning styles, whereas the contradictory results of other studies were based upon the incorporation of experimental methods to investigate the interaction between learning styles and reading resources (Lashell 1986; & Schuchardt, 1987). Also, students in the current sample had limited experience with other reading resources because reading teachers in Saudi schools are bound to use the formal reading task book in reading classes.

Chi-square anlyses revealed significant associations between students' learning styles groupings (multimodal or single VARK groups and VARK7G) for the RA subscale. This finding supports the findings of Lashell (1986), who reported a high increase in students' reading achievement when they learn reading using reading activities such as games, dramatic plays, simulations, workbooks, reading kits, and activity cards that match their learning styles. These types of stimulating and engaging reading activities could be implemented so as to match a wide varity of students learning styles preferences. In addition, the current results support the study of Brooks (1991). He used reading activities that were aligned with the students' learning styles such as writing assignments for tactual-kinaesthetic students, and listening to the tapes while moving their finger under the word for auditory students. Brook also reported a significant improvement in reading

achievement by using reading activities that correspond with students learning styles. The current findings also support the results of Crosley (2007) who reported that a match between classroom activities and students' learning styles lead to a strong positive effect on students' learning. These results, in conjunction with the current findings reinforce the idea that reading should be taught in a variety of ways rather than continuing to use the 'read aloud' approaches implemented in Saudi calssooms. Saudi school administrations and teachers need to be more responsive to utilising activities such as reading aloud, oral and written summarising, and discussion with peers or in groups. These reading class activities should satisfy students' needs according to their learning styles.

In contrast, Olson (2000) reported no significant interaction between the instructional activities used in medical schools and the learning styles of physical therapy students when assessed on the Gregorc inventory. Powell (1987) also found no significant differences between students' learning styles (visual, tactile, kinaesthetic and auditory) in grade three and four on mathematics activities such as game tables, magic carpets and media corner. These results are in contrast with the current findings due to several possible reasons. Firstly, particular characteristics of the subject matter (e.g., mathematics) may affect the interaction between instructional activities and students' learning styles because the content of these subjects may determine the presentation methods. Next, the instructional activities which were used may not correspond with students' learning styles.

The results also showed no significant associations between students' learning styles groups (multimodal or single VARK groups and VARK7G) on the DR and AS subscales of the TRSQ. This result supports the study conducted by Murphy (1990) that examined the effect of the match between students' learning styles and teachers' learning styles in relation to reading comprehension. Murphy study also reported no significance difference was found in the reading comprehension scores of students whose learning

styles preferences matched their teachers' learning style preferences. The lack of a relationship reported between learning style preference and DR in the current findings could be clarified by acknowledging that knowledge of learning style preference can create a framework whereby learners can acquire information their preferred way, whereas, reading comprehension relies on mental and cognitive skills.

Alternatively, Roark (1986) matched the learning styles of students in grades four and six with the learning styles of their teachers. The result indicated that matching the learning styles of students with their reading teachers has a significant effect on students' reading comprehension. Additionally, Williams (2010) indicated that there was a relationship between kinaesthetic, auditory and visual learning styles and reading comprehension levels. These studies provide positive evidence of the link between learning styles and reading comprehension. Learning styles may be considered a significant factor in the development of reading comprehension in partnership with other critical factors such as vocabulary and fluency.

It could be difficult, therefore, for students in Saudi preparatory schools to effectively determine the reading strategies (RI, RR, DR and SA) that satisfy their needs because of their limited educational experience. While they were significant differences on RA subscale, it could be that they were more aware of which reading activities matched their needs or their learning styles.

Summary

This chapter details the main study of this thesis. To answer the study research questions, 8 preparatory schools were selected randomly. From each school one grade 7 and one grade 8 Arabic language teachers were also selected randomly. They assessed their students in reading skills using RAAF. According to RAAF and FT 399 students were classified as high or low reading achievers. Students responded to the VARK and

TRSQ student form questionnaires, while teachers reacted to TRSQ teacher form questionnaire.

Data analysis revealed that most of the students in both the high and low reading achievement groups preferred more than one learning style. As a result, teachers should diversify the methods of teaching reading to satisfy the learning preferences of their students. The MANOVA result indicated that female students achieved better than male students in reading. Furthermore, female students with a visual learning styles preference achieved better than females with other learning style preferences on the RAAF. Among the male group, the post hoc tests showed that the students with preferences for the quad, tri or visual learning styles scored higher on RAAF than students who preferred read/write and kinaesthetic learning styles. A small association was found between learning style preference and gender in which males preferred the multimodal style more than females, whereas, the single mode style was a stronger preference for the females students. This suggests that gender is a factor that warrants consideration in matching teaching reading strategies to students learning style preferences.

The current study found a significant correlation between teachers responses to TRSQ and students reading achievement. This finding explored the relationship between teaching reading strategies (RI, RR and RA) and students' achievement on RAAF and FT. Moreover, the reading strategies of RI, RA and DR of the TRSQ students form were weak but significant predictive factors of students reading achievement on RAAF and FT. The chi square results showed significant associations between RA and VARK7G that reflected the students needed for reading class activities in Saudi schools. Reading activity during class was ofently preferred by defferent learning styles groups. the quad learners were the highest amonge other groups to prefere reading activites oftenly while aural learners were the lowest group.

The next chapter will provide the summary of this thesis. Furthermore, the recommendations of this study will be outlined, and will involve recommendations for both theory and practise, followed by recommendations for the Ministry of Education and Higher Ministry of Education in Saudi Arabia. Possibilites and suggestions for further research are also presented in the chapter

Chapter 6: Summary, Conclusions, and Recommendations

This chapter presents the summary and recommendations of the research based on the review of existing literature and the evaluation of the data collected within this project. It is envisaged that this information will be used as a reference tool by the Saudi Arabian government in determining education policy for Saudi preparatory school planning in the future. This research investigated the relationship between students' learning styles and their reading achievement in preparatory schools in Saudi Arabia. The conclusions and recommendations are based primarily on information obtained from the review of existing literature and the findings derived from the survey instruments used in this project.

The chapter is presented as follows: a general summary of the thesis, limitations of the thesis, conclusion and recommendations. The last section of this chapter contains suggestions for further research.

Summary of the Thesis

Chapter 1 presented the introduction, statement of the problem, purpose of this study and its contribution to knowledge. The introduction in this thesis outlines the theory regarding the connection between learning styles and reading achievement. Foley (1999) argued that the concept of learning style is useful for identifying and understanding how individuals learn and process information. Schuman (1987) stated that learning styles appear to have a definite impact on the acquisition of skills connected with learning to read. She noted that the teacher's inclusion of teaching strategies to accommodate learning styles is an important consideration in providing equal opportunities for the success of all students.

The American Federation of Teachers (1999) has indicated that many students have trouble in reading and writing. Approximately, 20% of elementary students have real difficulties learning how to read, while 20% have poor fluency. Around 25 % of adults also have limitations in the basic literacy skills which typically required in working environments.

In Saudi Arabia, around 20% of students in Saudi schools have been found to demonstrate reading difficulties (Hafiz, 2000). This evidence suggests that reading difficulties are viewed as a common problem, prompting the development of the current research framework to investigate the phenomenon.

The purpose of the study was to examine the relationship between learning styles and reading achievement in a cohort of preparatory school students in Jeddah, Saudi Arabia. Specifically, this study examined learning styles of Saudi preparatory school students who were rated as high or low in reading achievement. Information generated within this study may assist Saudi educational leaders in managing and developing specific remedial reading programs based on the research findings.

This study makes a contribution to the theory of learning styles and extends prior research findings through seeking evidence drawn from the Saudi educational field and focusing on three key areas of significance. Firstly, it contributes toward the theory of the psycho-educational viewpoint of learning styles. Secondly, the study offers those in the educational field further strategies to expand reading intervention programs which may assist lower achieving students. Finally, this research contributes to a growing body of knowledge in the psycho- educational field.

Chapter 2 presented the literature review for this study and comprised two main sections. The first section addressed learning styles and the second section addressed learning in reading. The first section in the literature review presented the outline of learning styles, the definition of terms, and learning styles' concepts and theories. The chapter also examined the distinctions between learning styles and cognitive styles, learning style instruments, factors affecting learning styles, learning styles and academic achievement, learning styles and reading achievement and stability of learning styles. There are many definitions of learning styles formulated from a range of different perspectives, such as educational

psychology. Learning styles have been defined in relation to cognitive, affective, and physiological attributes (Keefe et al., 1990). Researchers have also described learning according to visual, aural, read-write or kinaesthetic characteristics (e.g., Blerkom, 2008; Fleming, 2006). Several learning style researchers have connected the concept of learning style to individual personalities (e.g., Guild et al., 1985; Jackson, 2005;Riding et al., 1999), while other studies based learning style within social psychology perspective (e.g., Fuhrmann et al., 1983; Jonassen et al., 1993).

Significant associations between learning styles and academic achievement were also discussed in previous studies (Wallace, 1992; Yazicilar et al., 2009). Further to this, other researchers emphasised learning styles and academic achievement and the interaction of these characteristics to school grade (Bahar, 2009; Collinson, 2000; Matthews, 1996; Yazicilar et al., 2009). Conversely, Kia et al. (2008) and Cano-Garcia and Hughes (2000) indicated that there is no significant relationship between them. Others studied the effect of a student's learning style on their reading achievement (Price, Dunn and Sanders, 1981; Carbo, 1983; Foley, 1999).

The effect of a student's learning style on their reading achievement was examined in prior research. These have included studies conducted using grade three and six elementary school students (Price, Dunn& Sanders, 1981); and from grade two to four, six and eight (Carbo, 1983) Some studies have been focused on investigating the effect of one or more elements of Dunn's inventory on student reading achievement (Pizzo, 1981; MacMurren, 1985; Clyne, 1984; Littin, 2002). Most of the previous studies indicated a relationship between the preferred learning style of learners and their reading achievement.

The second section in the literature review discussed approaches of reading, reading resources, reading skills and students reading activities. This section also presented the

characteristics of good and poor readers, reading assessment and factors affecting reading achievement.

There are several approaches to learning reading such as: phonic approach (e.g., Carver, 2000; Mc Ginness, 2004; Reyhner, 2008; Trachtenburg, 1990) and whole language approaches (e.g., Clay, 1990; Goodman, 2005; Lapp et al., 2007). Many studies have investigated the reading resources used in the classroom and the creation of a unique environment in which to assist students in expanding their reading skills (e.g., McKeown et al., 2006; Pang et al., 2003; Talley, 1994). This section also described the various abilities that comprise the broad framework of reading skill such as comprehension (Arnoutes et al., 1998; Snow, 2002), vocabulary (Lehr, et al., 2004; Weizman et al., 2001) and fluency (NRP, 2000; Worthy et al., 2002). These factors are considered as important components of reading that learners need to develop in order to achieve their educational goals in school.

The literature review introduced and discussed in depth studies which focused on the issue of reading class activities and characteristics of good and poor readers. It also presented reading assessment methods, and factors that affect reading achievement. .

An overview of the Saudi Arabian education system is included in chapter 3. The development of education in the Arab Peninsula can be divided in two basic stages. The first stage is called the pre-Saudi era. Informal education such as Mosque education and Al-Katateeb schools were the prevalent form of education in some areas of the Arab Peninsula. In the pre-Saudi era some public schools were built during the rule of the Ottomans and Hashemi, but these approaches were not considered acceptable in the Al-Hijaz region. Furthermore, some private schools were established by Indians in the community, while other established by Makkah traders in an effort to provide educational opportunities for children in this era.

The second stage is known as the post-Saudi era. After Saudi was founded, the Royal Decree issued in 1925 announced the establishment of the Directorate of Knowledge. It was an important decision in Saudi education in post-Saudi era. This chapter included a description of the education system in Saudi Arabia, along with a description of financial support for the system. The development of male and female education in general was described separately, because each gender had its own supervision until 2002, with emphasis on preparatory schools. The next section described the styles of study plans and assessments in Saudi Arabian schools. The preparation of Arabic teachers and their role in Saudi schools was presented. Within this contextual theme, chapter three presented a typical reading lesson in a Saudi preparatory school and the reality of teaching and assessing reading in Saudi schools. Education after the foundation of Saudi Arabia become more organized based on a clear plan about the input and output expected of the school system.

Chapter 4 details the development of the assessment instruments and the pilot evaluation. This chapter commenced with the description of the pilot study paradigm. The next section discussed the necessity of conducting a pilot study in the education field. The pilot study in this research was carefully conducted in three steps. The pilot study was undertaken to examine the appropriateness of the instruments, psychometric qualities of all Arabic language versions of the measures and the time participants needed to response to the questionnaire. Face and content validity of the instruments was also presented in this chapter.

Students and teachers in Jeddah preparatory schools participated in this pilot study. Forty five male and female Arabic language teachers responded to the Teaching Reading Strategies Questionnaire (TRSQ) teacher form. Four teachers out of the forty five used the Reading Achievement Assessment Form (RAAF) to assess their students' reading and provided the researcher with their students' First Term (FT) scores. The student sample consisted of 155 preparatory school students. All students responded to the TRSQ student

form, while 85 of 155 also responded to a VARK questionnaire intended for younger participants.

The pilot study results showed that on the VARK learning style questionnaire most students preferred multimodal learning styles. The pilot study indicated that the number of participants demonstrating quad, tri and bi learning styles was larger than those demonstrating single visual, aural, read/write and kinaesthetic learning styles. Furthermore, female students trended towards single learning styles more than male students. The correlation between each VARK subscale and the total were .54, .64, .45 and .61 for visual, aural, read/write and kinaesthetic respectively. The correlation between VARK subscales and the total were moderate. The Cronbach's alpha coefficient of the 43 item TRSQ teachers' form was .94 and the internal consistencies of RI, RR, RA, DR and AS subscales were .52, .91, .82, .82 and .71 respectively. Furthermore, the reliability of the 41 item TRSQ student form was demonstrated by an overall Cronbach's alpha of .85 and subscale internal consistencies of .55, .68, .64, 68 and .41 for RI, RR, RA, DR and AS sequentially. The Cronbach's alpha for both forms of TRSQ was very good and the internal consistencies for TRSQ subscales in both form ranges between moderate and very good.

The methodology and analysis used in the main research for this thesis is detailed in Chapter 5. The sample consisted of 399 grade seven and eight students from eight preparatory schools in Jeddah, Saudi Arabia.16 teachers who taught Arabic reading in schools were also recruited for the study. The main study was conducted in three phases. There were six key findings, the first of which is that multimodal learning style quad style was the preferred style for most of students in both high and low achievement groups, whereas kinaesthetic was the preferred single learning style for both achievement groups. Secondly, the factors of grade, gender, interaction of grade and gender and interaction of gender and VARK7G had positive effects on the reading achievement of students. The third

finding was that the effect of gender on learning styles was significant within the VARK multimodal and single groups, while no significant relationships were found between gender and the VARK7G. Fourthly, there were small positive correlations found between reading achievement and RR, RI and RA subscales of TRSQ. The fifth key finding was that subscales of the TRSQ were significant predictors of student's reading achievement (RAAF and FT). Finally, the study highlighted a significant difference between students learning styles of VARK7G on the RA subscale of TRSQ.

Limitations of the Study

This investigation based in Saudi Arabia focuses on learning styles and reading accomplishments of preparatory schools students in the city of Jeddah. This does not mean that other districts were not appropriate for the study, but the selected city should have provided a strong representative sample because factors such as curriculum, policies, student demographics and teacher qualifications are very similar to other school settings throughout Saudi Arabia. Focussing on this location required less time and expense for the researcher, who is working in Jeddah and has extensive knowledge and familiarity with the area as a resident of the city.

The sample size of this study was limited to 16 Arabic language teachers and 399 students from grade 7 and 8 in eight preparatory schools in Jeddah. This limitation in sample size was primarily attributed to the time available for data collection. The recruitment of larger numbers of students and additional schools to broaden the sample may have provided valuable additional data but would have presented scheduling difficulties in managing the testing and data collection processes.

The limitation to grades seven and eight and the preparatory school setting, is due to the focus of the research and the type of measures selected. The students of these grades have the ability to respond to paper and pencil tests properly, can understanding the wording of

tests and will typically follow questionnaire instructions and items. However, they constitute a cohort of young people at the beginning stages of adolescence. During this time their individual characteristics change rapidly, particularly in relation to cognitive abilities. It has been previously reported that adolescents make large advances in the way they think, reason and learn (U.S. Department of Education, 2005).

This study depended on questionnaires as the main data collection methodology, an approach that has several limitations. This method relies on participant mood and honesty in the self reporting of their responses. The efficacy of responses is also dependent upon the clarity of the questionnaires' items and the presentation approach of the individual items (Cohen, 2000; McLeod 2003).The VARK, however is a self report, multiple choices test, which gives respondents the option to choose more than one answer for each question. It is a novel experience for students, since they are typically limited to one choice of answer for each question. Another limitation for the study is that VARK is rarely used in the Arabic context, and the version intended for younger participants has never previously been used in Arabic and academic research. The TRSQ (teachers and students form) also has limitations. This questionnaire was developed to assess only five subscales of reading teaching strategies. Furthermore, the variation in length of the five subscales may also have served as a limitation. Finally, the time limit that the school permitted for the research to be conducted made it difficult to apply a longer questionnaire.

The researcher could not find literature in Saudi Arabia or nearby countries on learning styles and reading achievement in any level of general education. One study by Haywood (2005) was done in Jeddah city but the sample was of non Saudi students at an international high school.

Conclusions

This study concludes that learning style is one of many factors that affect students' academic achievement. Most students who were of high or low reading achievement in grade seven and eight were more inclined to use multimodal learning styles (quad, tri and bi styles). Their responses showed that they used more than one sensory approach to process the information. The kinaesthetic learning style was the main preference style for students in the low achievement group. Focusing on this pattern during the teaching of reading may improve the kinaesthetic learning style of all students, as well as that of some of the multimodal students who indicated preferences towards the kinaesthetic style.

An important conclusion of the study was that grade level, gender and learning styles are all factors that can influence reading achievement. Female students attained higher scores in reading than male students. Furthermore, the limited freedom of girls in Saudi society to engage in a number of the societal activities in which boys are involved may offer them the opportunity to improve their skills in reading**.** Saudi females spend a much greater amount of time at home and as such may have more of a chance to focus on reading than boys. The interaction between gender and learning styles (VARK7G and multi-single) had a significant effect on reading achievement. Gender was the common factor that affected reading achievement in general. Visual, tri and quad male students scored better in reading than students with other style preferences. The visual style was typically one of the preferred styles for students who were tri and quad style. In the male group this could possibly be attributed to recent increases in the use of visual technologies (Katz & Aspden, 1997; Poulios & Vasiliadis, 2007).

There are significant differences in the number of male and female students classified within each of the multimodal and single learning styles groups. Male students tended more to multimodal learning style, while females preferred single learning styles. In VARK7G, the

quad style was the preferred learning style for male students; they also had a lower but similar level of preference for both tri and bi learning styles. The quad and bi styles were the preferred learning styles in the female group, followed by the tri style. The preferred single styles for both groups were the kinaesthetic style followed by the read/write style, with a higher level of preference for each style shown by the female group. The least preferred learning style was aural, for both genders. There were significant differences in learning styles between male and female students classified in multimodal and single VARK preference groups. The difference between genders may diminish when the number of learning style categories increase. This clearly showed when the result indicated no significant differences in learning styles between male and female students classified to their VARK7G group preference. Despite this, male and female students have different distributions on VARK7G subscales.

The teachers' responses on the TRSQ (teachers form) were correlated with students' reading achievement. The reading instruction (RI), reading resources (RR) and reading activities (RA) subscales of the TRSQ were significantly correlated with students' reading achievement (RAAF and FT). Diversity in reading instruction, reading resources and reading activities will promote opportunities for different students to understand and achieve in reading.

Students overall response to the TRSQ (students form) was a significant predictor of their reading achievement (RAAF and FT). This highlights the importance of a focus in teaching reading on practices that engage students. Improved results in reading achievement can be expected if students are taught by their preferred reading instruction approach, use different reading resources, participate in different reading class activities, develop their reading comprehension skills and get explicit feedback reading assessments.

The significant relationship between the reading activities (RA) subscale and VARK7G reflected the need of Saudi students to leave behind the routine methods currently used in teaching reading. Several reading class activities could be used in Saudi schools to meet students' preferred learning styles. For example, activities that incorporate reading the text aloud in reading classes, during which relevant images are displayed, may meet the need of students whose learning styles are aural or visual. Furthermore, discussion activities integrated within reading classes may assist student with an aural learning styles preference to better understand the reading lesson, whereas writing activities might assist students with a preference for read/write styles.

Recommendations

The literature review regarding learning styles and findings of the current study have contributed to the following recommendations. This section presents general recommendations for theory and practical considerations for learning styles theory in the field of education. This section concludes with recommendations for Saudi education authorities, including the Ministry of Higher Education and Ministry of Education.

Recommendation for learning styles theories

The outcomes of this study may influence a number of existing learning style theories and typically indicate that learning can be fostered by incorporating a range of activities that complement an individual's preferred learning style. Many of these theories are linked to learning style measurement instruments that are receiving greater utilisation in education fields. It is my recommendation that learning styles experts should adopt a definition of learning styles that details the general framework of the factors influencing learning styles, such as cognitive abilities, personality and sensory perception. The definition should serve as an important point of reference for educational experts and researchers operating in the learning styles field.

Within some learning styles theories, students may be distributed throughout a range of learning style categories, according to the number of categories in each theory. For example, in the VARK theory learners can be classified into more than four learning style categories. It is a recommendation, prompted by the current study, that reducing the number of these categories could facilitate the theory to be more easily implemented in the field of education. Furthermore, excluding Dunns' inventory, most learning styles instruments would benefit from further studies that include samples of younger learners.

In the literature review in this study, the reliability and validity of some learning styles measures were criticised. An important recommendation of the current study is that several of the learning style assessment instruments are to be redesigned. The statistical reliability and validity of the current design of the VARK is difficult to assess. Likert scales format may lead to improved reliability and validity. According to Madu (2003) the statistical results showed higher reliability when studies used Likert scales as the method of response for the instruments. Furthermore, redesigning VARK questionnaires to use the Likert scale could be useful for responders evaluating themselves. Suskie (1996) stated that "Likert scales are more successfully used to measure attitudes or opinions rather than factual information" (p. 33).

An additional recommendation is that further research is undertaken regarding the learning styles of school children in Saudi Arabia. The current study utilised the version of the VARK questionnaire designed for younger respondents. An important consideration regarding the VARK was detailed by Fleming (2006) who mentioned that younger people in schools veer towards kinaesthetic learning styles followed by the aural learning styles. This may be occurring in Saudi Arabia, thus it is recommended that future research in determining students' learning styles utilises other measures such as Dunns' inventory or the VAK

inventory to continue tracking the expected learning style development of Saudi school children.

Recommendation for educational practice

The identification of the learning styles of students has been put forward as a contributing factor in the development of students' academic achievement (Busato, Prins, Elshout &Hamaker, 2000). There is evidence within the literature indicating how mismatching between students' learning styles and teaching methods being used can affect students' academic achievement (e.g., McClogin, 2000; Olson, 2000).

Teaching each student according to his or her specific learning style is an unfeasible goal for schools in the light of curriculum requirements and limitations regarding the time available for subjects within school timetables. As a result, the Saudi education system (General and Higher) should adopt a schooling program which educates students about their learning styles. This type of program could include workshops that encourage students to receive the information and modify the information to meet their strongest style. The program would aid in the preparation of students to deal with information which is mismatched to their learning style. For example, the visual learner, when receiving verbal information, should be able to alter this information to create an image in their mind or draw the information on paper.

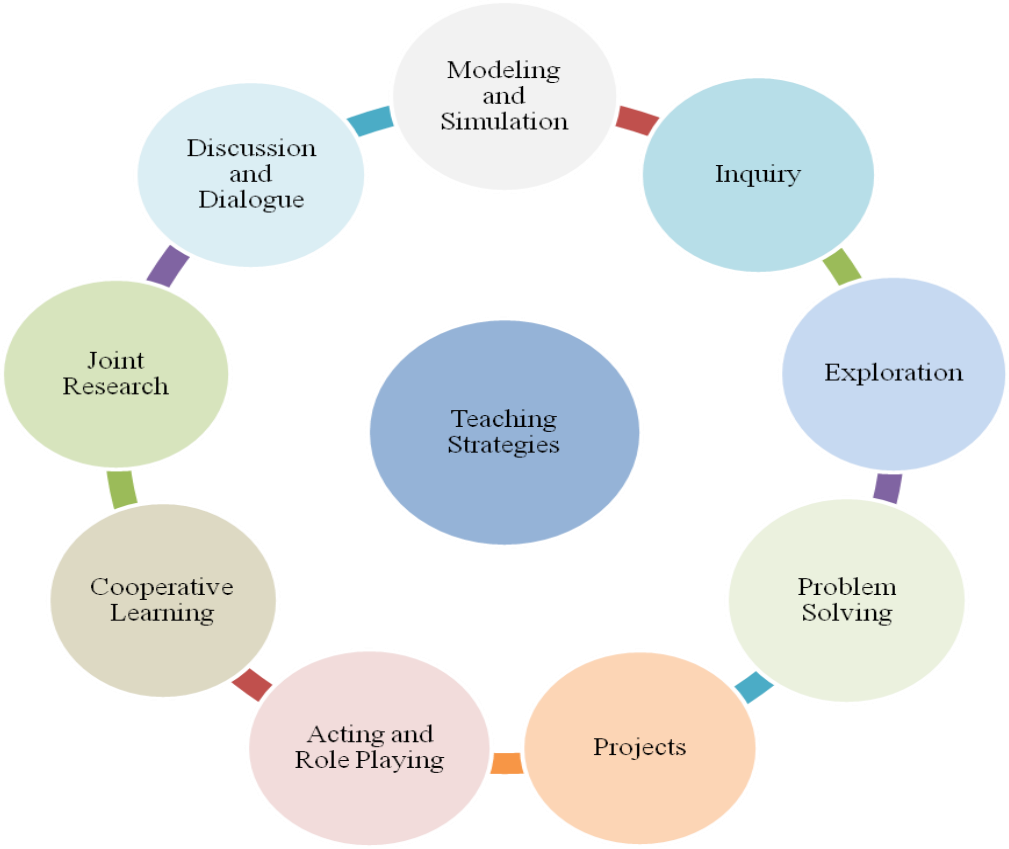
Learning styles are one of the fundamental theories to be considered when constructing the reading curriculum. Learners, according to the VARK learning style theory, can be divided into visual, aural, read-write, kinaesthetic and multimodal. Consequently, the reading curriculum should include texts and activities that match all learning styles in the class room. Educational tools that support the different learning styles of students should be employed during the teaching of reading. Tools such as CD-roms, films, audio recordings,

posters and wordplay can be useful materials for teachers to use when teaching reading, so as to work toward establishing a strong match between content and learning styles.

Teaching methods should be diverse when teaching reading skills to children. In this case, teachers should provide opportunities for students to find the teaching method that best fits their learning styles. For example, teachers in the classroom can use acting and role playing strategies for students whose learning style is kinaesthetic, modelling and simulation for visual learners, discussion and dialogue strategies for aural learners, an inquiry strategy for read/write learners. and cooperative learning for students who prefer to learn in groups. A range of teaching strategies that could have a direct association with students' learning styles are identified in Figure 27.

Learning styles should be taken into consideration when assessing progress in the development of students' reading skills. As a result, reading assessment tools should be varied and designed on the basis of learning style theories. These various reading assessment tools will give teachers an opportunity to select the assessment tool which best fits students learning styles, and that helps them to understand the question and, therefore, reflect their real achievement.

Figure 27. Teaching reading strategies



Recommendation for Ministry of Higher Education

1. Include courses within the professional preparation of teachers that provide student teachers with sufficient skills to identify student learning styles.
2. Include a number of courses in teacher education programs that train teachers to prepare and use learning tools that help in teaching of all students regardless of differences in learning styles.
3. Organize conferences and workshops to increase awareness within Saudi society about learning styles and how they affect the academic achievement of students.
4. Encourage faculty members to examine the learning styles of students in all stages of Saudi education in order to identify the various learning style profiles.

5. Encourage faculty members to translate learning styles measurements and questionnaires into the Arabic language and examine the instruments' reliability and validity in Saudi society.

Recommendation for Ministry of Education

1. Teachers, textbook authors and curriculum developers should become familiar with the theories associated with learning styles and be able to present appropriate materials to students according to their learning styles and grade levels.
2. Teachers should encourage students to learn course material by focussing on the use of the learning style they prefer.
3. Teachers in their classrooms should classify students into different groups according to their learning styles. They could then administer different types of questions and examples that match these learning styles and which lead them to fully comprehend concepts that are taught.
4. Administrators in public schools should provide their school teachers with the findings of the research that has been done in this field.
5. School counsellors should be aware of the learning styles instruments and research results to a greater degree than the other educational staff in a given school. They are responsible for identifying reasons behind the difficulties that students face in school.
6. Educators should take into account that students in the classroom may be the same age but possess different learning styles. Therefore, appropriate materials should be available in the classroom to be presented to the students as required.
7. It is recommended that the Ministry of Education should provide teachers and curriculum developers with in-service training regarding learning styles theories

and instructional strategies in all educational areas (e.g., mathematics, languages) and at different stages across the school system (e.g., primary, secondary).

Future Research

Outcomes of the current study have highlighted a lack of research on learning styles in the Saudi education field. A suggestion for further research could be to investigate whether other variables such as income and level of parental education have an impact on student learning styles and their academic achievement. A comparison study can be conducted in both rural and urban areas by using Dunn's theory, with academic achievement measured in different subject matter. Additionally, research related to learning style theories should be conducted within public and private schools in different parts of Saudi Arabia. Further research can be done to compare students' learning styles at public and Holy Quran schools. Furthermore, investigating the effect of teaching low achievers in mathematics according to learning styles may become an important study for researchers in Saudi Arabia. The outcome of an empirical study, based on the learning styles theory, could provide a new lens through which to view the mathematics curriculum and prompt a re-read or re-think of approaches to the delivery of mathematics content by relevant curriculum experts in the Saudi Ministry of Education. There is also scope for longitudinal studies to investigate the stability of learning styles in Saudi society according to gender and region.

For universities, there is scope for an analytical study to be undertaken to examine the relationship between learning styles and academic achievement in a range of majors. Research could be also conducted to measure the relationship between learning styles and students' choice of major. A comparison study of the learning styles of university students who study in Saudi Arabia and Saudi students who study overseas could also be implemented. Furthermore, differences between the learning styles of students in vocational education and university education warrant examination. The result of these types of studies

could provide the evidence needed for existing higher education programs in Saudi Arabia to be modified, and new programs developed in Saudi universities and institutes that incorporate teaching based on learning style principles. Finally, there is a need for future research that captures the profile of Saudi students in both the general and higher education stages. These types of studies could provide evidence to aid the design of an improved curriculum suitable for the Saudi education environment.

Reading difficulty is considered one of the most important educational problems that Saudi schools face. This thesis aimed to draw a clear profile of Saudi students' learning style characteristics at both sides of the reading achievement curve. Most of the students with high and low reading achievement were found to depend on more than one learning style preference. The designers of the Saudi curriculum should give more attention to the academic studies that provide the educational field with scientific evidence behind the satisfaction of students' needs

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Appendices

Appendix A: TRSQ Review

Review of Teaching Reading Strategies Questionnaire

Thank you for agreeing to review the following questionnaire. The questionnaire is designed to assess teaching reading strategies which be used in Saudi preparatory schools. The questionnaire comprises five subscales: reading instruction, reading resources, reading activities, development of reading comprehension skills, and assessment. Fifty two questions will exemplify those subscales according this table.

reading instruction	reading resources	reading activities	Develop reading comprehension skills	Assessment
1 – 6	7- 23	24- 38	39- 45	46-52

It would be appreciated if you would take the time to read the questionnaire and then examine the items by completing the questionnaire. Please also feel free to write comments on the questionnaire.
Your feedback to the following questions would be extremely useful: Please circle either 'yes' or 'no' and provide further comments if you wish.

1. Was the aim of the questionnaire clear? **Yes No**
   Comments
   _____
   _____
   _____
   _____

2. Were you able to understand the questionnaire? **Yes No**
   Comments
   _____
   _____
   _____
   _____

3. Were there ambiguity in the questionnaire? **Yes No**
   Comments
   _____
   _____
   _____
   _____

4. In your opinion does the questionnaire adequately examine?

	Yes	No
reading instruction and organize students		
reading resources and types of text		
reading activities and behaviour		
Develop reading comprehension skills or strategies		
Assessment		

Comments

_____
_____
_____

5. Were you able to respond effectively on the rating scales as presented? **Yes** **No**

Comments

_____
_____
_____
_____

6. Please provide any other comments about this questionnaire.

Comments

_____
_____
_____
_____

Thank you very much for your participation and feedback.

استبيان إستراتيجيات تدريس القراءة

أخي المعلم / أختي المعلمة أود ان أشكر لك كرمك في مراجعة وتقييم استبيان إستراتيجيات تدريس القراءة ، هذا الإستبيان صمم لتعرف على طرق تدريس القراءة المستخدمة في المدارس المتوسطة في المملكة العربية السعودية . هذا الإستبيان يضم خمسة ابعاد تغطي إستراتجيات تدريس القراءة وهي مرتبة كتالي البعد الأول ويشمل على أسئلة تبحث المنهج او الأسلوب المستخدم في تدريس القراءة و تنظيم التلاميذ اثناء درس القراءة. البعد الثاني ويحتوي اسئلة تبحث عن المصادر المستخدمة في تدريس القراءة و أسلوب أو نوع النص المستخدم . البعد الثالث ويبحث عن ألأنشطة أو السوكيات المستخدمة اثناء تدريس القراءة. في حين ان البعد الرابع يبحث في طرق المستخدمة من قبل المعلم في مساعدة التلاميذ لفهم ما يقرؤنه اما البعد الأخير فهو يغطي طرق قياس و تقويم القراءة. وبالتالي تتوزع اسئلة الإستبيان وفق للجدول التالي :

البعد الأول	البعد الثاني	البعد الثالث	البعد الرابع	البعد الخامس
6-1	23 -7	38 -24	45 -39	52 -46

أقدر لك شاكرا تخصيص جزء من وقتك لقراءة الإستبيان ولإجابة عليه ومن ثم تقييمه وفق للأسئلة التالية ، كما ارجو أن لا تبخل علي بأي ملاحظة ترى أهميتها في تعديل و تطوير الإستبيان ليحقق الأهداف التي وضع من أجلها. علما بأن طريقة التقيم هي وضع دائرة حول الإجابة سواء نعم أو لا ومن ثم كتابة ملاحظاتك حول الإستبيان بحرية دون تردد في السطور التي تلي كل سؤال أكرر شكري وتقديري لك وفقك الله

الباحث

أولاً: هل قائمة الأسئلة في الإستبيان واضحة ؟ نعم لا

ثانيا: هل عناصر الإستبانة كانت مفهومة؟ نعم لا

ثالثاً: هل كان هناك غموض في الإسئلة ؟ نعم لا

رابعا : من وجهة نظرك هل كانت الإستبانة تقييس بدقة الأبعاد التالية

أبعاد المقياس	نعم	لا
دروس القراءة و تنظيم التلاميذ اثناء درس		
المصادر المستخدمة في تدريس القراءة و أسلوب أو نوع النص		
الأنشطة أو السوكيات المستخدمة اثناء تدريس القراءة.		
طرق المعلم في مساعدة التلاميذ لفهم ما يقرؤونه		
طرق قياس و تقويم القراءة		

ملاحظات

_____

_____

_____

_____

خامسا : هل كان بأستطاعتك الإستجابة بفعالية على اسئلة الإستبيان ؟ نعم لا

ملاحظات

_____

_____

_____

_____

سادسا : فضلا إذا كان لديك اي ملاحظات ترغب في إضافتها فلا تتردد

ملاحظات

_____

_____

_____

_____

شاكر ومقدر تعاونك وفقك الله

Summary of Arabic Language Teachers Reviews

1. Clarity of questionnaires.

Most of the comments about the questionnaire were the clear and some of the reviewers wrote several suggests to improve the questionnaire for example delete some questions or make paraphrase for some questions

2. Understanding the questionnaire.

Most of the reviewers were able to understand the questionnaires

3. Ambiguity of the questionnaire

The general consensus of the reviewers was distinct. Suggested modifications related to this area was about vocabulary should be simplified.

4. Does the questionnaire adequately examine the subscale?

Most of the reviewers were agreeing that the questionnaire was adequately examinir the subscale which involve of the questionnaire.

5. Respond to questionnaire.

Most of the reviewers were responded effectively to the questionnaire

6. Additional Comments

Some of general comments suggested printing the questionnaire with large size.

Give the teacher free time to answer the questionnaire.

Decrease the number of the item.

Appendix B: Reading Achievement Assessment Form (RAAF)

Reading Achievement Assessment Form (RAAF)

School:……. **Grad**:…… . **Class**: ……..…

Teacher Name:…….. **Date**: ……..……

N	Student Name	Comprehension	Speed reading	Tense of sentence	Vocabulary	summary	total
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							

Excellent	V. Good	Good	Satisfactory	Week
5	4	3	2	1

TEACHER NAME:……

إستمارة تقييم القراءة

إعداد الباحث : ابراهيم عبده صعدي

المدرسة :..... الصف : .....

الفصل :..... التاريخ : .....

م	اسم التلميذ	الفهم	طلاقة القراءة	زمن الجمل	المفردات	التلخيص	المجموع
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							

ممتاز	جيد جدا	جيد	مقبول	ضعيف
5	4	3	2	1

اسم المعلم :.....

Appendix C : VARK Questionnaire

The VARK Questionnnaire – The Younger Version

How Do I Learn Best?

Choose the answer which best explains your preference and circle the letter(s) next to it.
Please circle more than one if a single answer does not match your perception.
Leave blank any question that does not apply.

1. I like websites that have:
   a. things I can click on and do.
   b. audio channels for music, chat and discussion.
   c. interesting information and articles in print.
   d. interesting design and visual effects.
2. You are not sure whether a word should be spelled 'dependent' or 'dependant'. I would:
   a. see the words in my mind and choose by how they look.
   b. hear them in my mind or out loud.
   c. find them in the dictionary.
   d. write both words on paper and choose one.
3. You want to plan a surprise party for a friend. I would:
   a. invite friends and just let it happen.
   b. imagine the party happening.
   c. make lists of what to do and what to buy for the party.
   d. talk about it on the phone or text others.
4. You are going to make something special for your family. I would:
   a. make something I have made before.
   b. talk it over with my friends.
   c. look for ideas and plans in books and magazines.
   d. find written instructions to make it.
5. You have been selected as a tutor or a leader for a holiday program. This is interesting for your friends. I would:
   a. describe the activities I will be doing in the program.
   b. show them the map of where it will be held and photos about it.
   c. start practising the activities I will be doing in the program.
   d. show them the list of activities in the program.
6. You are about to buy a new digital camera or mobile phone. Other than price, what would most influence your decision?
   a. trying it.
   b. reading the details about its features.
   c. it is the latest design and looks good.
   d. the salesperson telling me about it.
7. Remember when you learned how to play a new computer or board game. I learned best by:
   a. watching others do it first.
   b. listening to somebody explaining it and asking questions.
   c. clues from the diagrams in the instructions.
   d. reading the instructions.

8. After reading a play you need to do a project. Would you prefer to:?
    a. write about the play.
    b. act out a scene from the play.
    c. draw or sketch something that happened in the play.
    d. read a speech from the play.

9. You are about to hook up your parent's new computer. I would:
    a. read the instructions that came with it.
    b. phone, text or email a friend and ask how to do it.
    c. unpack the box and start putting the pieces together.
    d. follow the diagrams that show how it is done.

10. You need to give directions to go to a house nearby. I would:
    a. walk with them.
    b. draw a map on a piece of paper or get a map online.
    c. write down the directions as a list.
    d. tell them the directions.

11. You have a problem with your knee. Would you prefer that the doctor:
    a. showed you a diagram of what was wrong.
    b. gave you an article or brochure that explained knee injuries.
    c. described to you what was wrong.
    d. demonstrated what was wrong using a model of a knee.

12. A new movie has arrived in town. What would most influence your decision to go (or not go)?
    a. you hear friends talking about it.
    b. you read what others say about it online or in a magazine.
    c. you see a preview of it.
    d. it is similar to others you have liked.

13. Do you prefer a teacher who likes to use:
    a. demonstrations, models or practical sessions.
    b. class discussions, online discussion, online chat and guest speakers.
    c. a textbook and plenty of handouts.
    d. an overview diagram, charts, labelled diagrams and maps.

14. You are learning to take photos with your new digital camera or mobile phone. I would like to have:
    a. examples of good and poor photos and how to improve them.
    b. clear written instructions with lists and bullet points.
    c. a chance to ask questions and talk about the camera's features.
    d. diagrams showing the camera and how to use it.

15. You want some feedback about an event, competition or test. I would like to have feedback:
    a. that used examples of what I have done.
    b. from somebody who discussed it with me.
    c. that used a written description or table of my results.
    d. that used graphs showing what I achieved.

16. You have to present your ideas to your class. I would:
    a. make diagrams or get graphs to help explain my ideas.
    b. write a few key words and practice what to say again an again.
    c. write out my speech and learn it by reading it again and again.
    d. gather examples and stories to make it real and practical.

إستبيان فارك (VARK) المعرب - تعريب الباحث ابراهيم بن عبده الصعدي
كيف أتعلم بشكل أفضل
إختر الإجابة التي تشرح إختيارك الأفضل عن كل سؤال، يمكنك إختيار أكثر من إجابة إذا كان الجواب الواحد لا يطابق إدراكك الحسي. كما يمكنك تجاوز السؤال الذي لا ينطبق عليك دون إجابة

1 أنا أفضل مواقع الإنترنت التي تحتوي على
أ أشياء يمكن أضغط عليها لتعمل
ب قنوات سمعية تحتوي على تسجيلات سمعية.
ج معلومات وتفسيرات و مقالات وصفية مكتوبة.
د تصاميم شيقة ومواصفات مرئية كرسومات وألوان وغيرها.

2 أنت غير متأكد من أن هجاءك للكلمة "مضطرب" أو "مضظرب" يمكنك أن:
أ يمكنك تخيل الكلمة في عقلك وتختار حسب الشكل الذي تراه.
ب تفكر بكل كلمة بصوت مسموع وتختار واحدة .
ج تبحث عنها في القاموس.
د تكتب الكلمتين على ورقة وتختار واحدة.

3 تريد أن تخطط لمناسبة مفاجئة لأصدقائك فأنك :
أ فقط تدعو أصدقائك وتدعهم يستمتعوا
ب تتخيل ما سيحدث في المناسبة
ج تكتب قائمة بما ستفعل وما سوف تشتريه للمناسبة
د تتحدث عن المناسبة هاتفياً مع الآخرين أو تراسلهم.

4 أنت بصدد أن تحضر وليمة خاصة لعائلتك فيمكنك أن:
أ تعمل شيء ما سبق أن قمت بعمله.
ب تتحدث مع أصدقائك عما ستعمله لعائلتك.
ج تبحث عن فكرة ما في الكتب أو المجلات.
د تستخدم كتاب فن الطبخ وتعليمات التحضير.

5 تم إختيارك كقائد أو مرشد في رحلة مع مجموعة من أصدقائك فيمكنك أن
أ تصف الأنشطة التي سوف تعملونها في الرحلة
ب تستعمل خريطة أو صور لتريهم الأماكن.
ج تبدأ بالتدريب على الأنشطة التي ستعملها في الرحلة.
د تعرض عليهم قائمة عن أنشطة البرنامج

6 أنت بصدد أن تشتري آلة تصوير رقمية أو هاتف نقال، بعيداً عن السعر ما الذي يؤثر على قرارك .
أ تجربة الجهاز واختباره
ب قراءة تفاصيل عن مواصفاته
ج كون الجهاز ذو تصميم حديث ومظهره جيد
د البائع أخبرك عن مواصفاته

7 تذكر مرة تعلمت فيها شيء جديداً، حاول عدم تذكر مهارات جسدية كركوب الدراجة مثلاً،فأنت تعلمت أفضل بواسطة
أ مشاهدة شخص ما يقوم به أولاً
ب الاستماع إلى شرح شخص ما حول الموضوع وتوجيه الأسئلة له
ج رسوم بيانية ومساعدات مرئية عن الموضوع
د قراءة التعليمات المكتوبة

8 بعد قراءة قصة أو مسرحية عليك أن تعمل مشروع عنها فيمكنك أن
أ تكتب عن القصة أو المسرحية.
ب تقوم بتمثيل مشهد من القصة أو المسرحية.
ج تقوم برسم تخطيطي لشيء ما حدث في القصة أو المسرحية.
د تقرأ جزء أو خطبة من القصة أو المسرحية.

9 انت بصدد تجميع جهاز الحاسب الجديد الخاص بوالدك فإنك تفضل أن
أ تقرأ كتيب التعليمات المرفق مع الجهاز
ب تتصل او ترسل رسالة قصيرة او رسالة الكترونية لصديق تسأل عن طريقة التجميع
ج تفتح صندوق الجهاز وتبدأ في وضع القطع مع بعضها
د تتبع الرسومات التوضيحية التي توضح كيفية عمل ذلك

10 تريد أن تعطي توصيف منزل بالجوار لشخص ما فإنك تفضل أن
أ تذهب معهم الى المنزل المقصود
ب ترسم خريطة أو مخطط على قطعة ورقية أو ترسل المخطط عن طريق البريد الإلكتروني
ج تكتب الوصف علي شكل قائمة أو نقاط
د تخبرهم بالتوصيف لفظياً

11 لديك مشكلة في ركبتك فأنت تفضل الطبيب الذي:
أ يعطيك رسمًا عن المشكلة
ب يعطيك مقال أو نشرة تشرح لك المشكلة
ج يتحدث إليك يصف لك المشكلة مباشرة
د يستخدم نموذجًا بلاستيكيًا لشرح المشكلة

12 برنامج تلفزيوني سوف يعرض قريبًا فإن أكثر شيء يؤثر عليك لمشاهدته هو
أ أن تسمع أصدقائك يتحدثون عنه
ب أن تقرأ ما قاله الآخرون عنه في الإنترنت أو المجلات أو الصحف
ج تشاهد مقاطع منه
د أن يكون شبيه بالأشياء التي تفضلها

13 انت تفضل المعلم الذي يستخدم
أ عروضاً ونماذج أو جلسات تطبيقية
ب المناقشة الفصلية أو المناقشة المباشرة إستضافة شخص عن طريق الإنترنت
ج كتب عن موضوع الدرس وكثير من الكتيبات الخارجية
د رسوم بيانية مخططات وصور

14 أنت تتعلم كيف تلتقط صور بواسطة آلة التصوير الرقمية أو جهاز الهاتف النقال فإنك تفضل أن
أ مثال للصور الجيدة والصور الرديئة وكيفية تحسينها.
ب معلومات تفصيلية مكتوبة بوضوح مع قائمة بالنقاط
ج فرصة لطرح سؤال و التحدث عن مميزات آلة التصوير.
د رسوم تخطيطية تعرض آلة التصوير أو الهاتف النقال وكيفية استخدامها

15 تريد بعض التعليقات حول بعض المنافسات او الإختبارات التي قمت بها فانك تفضل ان تكون التعليقات
أ تستخدم أمثلة عملية توضح ماذا عملت
ب منْ الشخص الذي يناقشها معك
ج تستخدم الوصف الكتابي أو جدول لنتائج
د التي تستخدم الرسوم البيانية التي توضح ما أنجزته

16 عليك أن تعرض أفكارك على زملائك في الفصل فإنك تفضل أن
أ تستخدم رسوم بيانية أو مخططات للمساعدة في شرح أفكارك
ب تكتب بعض الكلمات المساعدة في الشرح وتتدرب علي نطقها.
ج تكتب ما سوف تقوله على الورق ثم تقرأه مرات ومرات
د تجمع أمثلة و قصص لجعلها حقيقه وواقع.

Appendix D: Permission of use VARK

- VARK and Copyright

From: **Fleming Neil** (flemingn@ihug.co.nz)
Sent: Friday, 28 November 2008 6:25:33 AM
To: ibrahim.saadi@live.vu.edu.au

Dear Ibrahim

Thank you for seeking permission to use VARK. We rely on the honesty of people to act in a professional way when using our materials. Many don't know that businesses, government agencies and professional sports groups must obtain permission or be licensed to use the VARK copyright materials. You may not place VARK copyright materials on an open-access website, or place the VARK questionnaire on your intranet without contacting us. If you want to use VARK on a site you need special permission.

You are welcome to use the VARK materials by linking to our online website, or in paper format, for your research studies, providing suitable acknowledgement is made.

This is the acknowledgement I prefer:

© Copyright Version 7.0 (2006) held by Neil D. Fleming, Christchurch, New Zealand and Charles C. Bonwell, Green Mountain Falls, Colorado 80819 U.S.A.

You may be interested in our new VARK Subscription service which does not need any installation on your system. You can capture the VARK scores for your your class or classes, work team or colleagues and the results are available to you using your own password. The Subscription Service is demonstrated on our website in a working example. There is also sophisticated and specialised VARK software that allows you to capture and use the data from your own students on your own intranet.

To comply with copyright laws, trainers should consider purchasing an inexpensive VARK Licence with a once-only lifetime or annual fee.

We also have a VARK PowerPoint presentation, a Resource Kit and a VARK Score sheet for large numbers of respondents.

You may find the two VARK books helpful for your work. There is also a book that teachers use for widening their repertoire of strategies. It is titled - "55 Strategies for Teaching" and has 55 practical ideas.

VARK principles are being applied to coaching athletes and sports players and a new book titled "Sports Coaching and Learning" is now available.

To purchase any of these resources (above) you can use a personal check/cheque, an institutional Purchase Order or buy from our secure website with your credit card.

Best wishes for your work.

Neil

Neil Fleming
Designer of the VARK Questionnaire
50 Idris Road, Christchurch 8052
New Zealand
www.vark-learn.com
phone:(64) 3 3517798
fax:(64) 3 3519939

Appendix E: TRSQ (Teachers form)

Reading Teaching Strategies Questionnaire (teacher form)

Name:..... School:.....Class:.....

N	Terms	Always	Often	Sometimes	Never
1	In my classroom I teach reading as a whole class activity.				
2	In my classroom I prefer to teach reading for mixed ability groups.				
3	In my classroom I use individualized instruction for reading.				
4	When I teach reading I use reading series.				
5	I ask students to use workbooks or worksheets in reading classes.				
6	Children's newspapers and magazines are use to support my teaching of reading.				
7	Computer software (e.g., CD, DVD) is use to support my reading instruction.				
8	I use reading material on the internet in my reading classes.				
9	I use a variety of children's books in reading classes.				
10	I use material from other subjects in reading classes.				
11	I use written material by students to support my teaching .				
12	I encourage students to read short stories in reading classes.				
13	I encourage students to read longer books with chapters in reading classes.				
14	Student in my class are encouraged to read poems and plays in reading classes.				
15	I encourage students to read descriptions and explanations about things and people in reading classes.				
16	Student in my class are encouraged to read instructions or manuals about how things work in reading classes.				
17	I teach students to read charts, diagrams, graphs in reading classes.				
18	In my class use the same materials with all students because all students are at the same reading level.				
19	I use the different materials with students at different reading levels.				
20	I read aloud to the class.				
21	I give students time to read books of their own choosing.				
22	When I teach reading I teach strategies for decoding sound and words.				

	Terms	Always	Often	Sometimes	Never
23	I teach students new vocabulary systematically				
24	I help students to understand new vocabulary in texts they are reading.				
25	I ask students to answer reading comprehension questions in workbooks or on a worksheet about what they have read.				
26	Students in my class are asked to write something about what they have read.				
27	I ask students to answer oral questions or orally summarize what they have read.				
28	Students in my class are asked to talk with each other about what they have read.				
29	I ask students to do a project about what they have read (e.g., a play or art project).				
30	I give students a written quiz or test about what they have read.				
31	My students are asked to identify the main ideas of what they have read.				
32	I ask students to explain or support their understanding of what they have read.				
33	My students are asked to compare what they have read with experiences they have had.				
34	My students are asked to compare what they have read with other things they have read.				
35	My students are asked to make predictions about what will happen next in the text they are reading.				
36	My students are asked to make generalizations and draw inference based on what they have read.				
37	I ask student to describe the style or structure of the text they have read.				
38	I assess reading progress of students by classroom test.				
39	Multiple choice questions on reading material are used to assess reading progress.				
40	Short answer written questions about what students have read are used to assess reading progress.				
41	I assess reading progress by asking oral questioning of student.				
42	Students give an oral summary or report of what they have read.				
43	I ask students to write long paragraphs as a response to what they have read.				

إستبيان إستراتجيات تدريس القراءة {نسخة المعلم}

اسم المعلم : .....المدرسة :.....الصف الذي يدرسه:.....

أخي المعلم - أختي المعلمه بين يديك إستبيان إستراتجيات تدريس القراءة. المطلوب قراءة العبارة جيداً ومن تقدير مدى استخدامك لهذه الإستراتجية عندما تدرس القراءة ومن ثم ضع بوضوح علامة {√} أسفل التقدير الذي ترى انه يناسب استخدامك للإستراتجية اثناء درس القراءة.

م	العبـــــــــــارات	دائماً	غالباً	أحياناً	ابداً
1	أدرس القراءة للفصل بأكمله كنشاط جماعي				
2	أفضل تدريس القراءة للمجموعات من التلاميذ ذوي مستوى دراسي متقارب				
3	أفضل تدريس القراءة لمجموعات من التلاميذ ذوي مستوى دراسي متفاوت				
4	في الفصل أستخدم التدريس المنفرد في تدريس القراءة				
5	أشجع التلاميذ على العمل المستقل للواجبات ولأهداف في مادة القراءة				
6	أشجع التلاميذ على العمل المستقل على الأهداف التي اختاروها بأنفسهم				
7	أستخدم الكتاب المقرر لتدعيم تدريسي للقراءة				
8	عند تدريسي للقراءة استخدم كتب أو مواضيع القراءة المتسلسلة				
9	أطلب من التلاميذ أستخدام كتب النشاط أو أوراق العمل في حصة القراءة				
10	أستخدم مجلات وصحف الأطفال عند تدريس القراءة				
11	أستخدم برامج الكمبيوتر لدعم تدريسي للقراءة				
12	أستخدم مواد من شبكة الأنترنت في حصة القراءة				
13	أستخدم كتب أطفال مختلفة عند تدريس القراءة				
14	أستخدم مواد من موضيع مختلفة في تدريسي القراءة				
15	أستخدم مواضيع مكتوبة من قبل التلاميذ عند تدريسي القراءة				
16	أشجع التلاميذ على قراءة القصص القصيرة في حصة القراءة				
17	أشجع التلاميذ على قراءة الكتب الطويلة ذات الفصول المتعددة في حصة القراءة				
18	أشجع التلاميذ على قراءة الشعر و المسرحيات في حصة القراءة				
19	أشجع التلاميذ على قراءة مواضيع الوصف و الشروحات عن الأشياء و الناس				
20	أشجع التلاميذ على قراءة كتيبات التعليمات عن كيفية عمل الأشياء				
21	أعلم التلاميذ كيفية قراءة الرسوم البيانية و الإحصائية				
22	أستخدم نفس المواد و الوسائل مع جميع التلاميذ لأنهم متساون في مستوى القراءة				
23	أستخدم مواد ووسائل مختلفة عند تدريس القراءة نظراً لأختلاف مستوى قراءة التلاميذ				
24	أقراء بصوت مرتفع لجميع التلاميذ				
25	أطلب من التلاميذ القراءة بصوت عالي لزملائهم في كل الفصل				
26	أطلب من التلاميذ القراءة الجهرية في مجموعات داخل الفصل				
27	التلاميذ في فصلي يقرؤون بصورة صامته لأنفسهم				
28	أطلب من بعض التلاميذ القراءة بصورة صامته في حين أطلب من البعض القراءة جهريا				
29	أعطي وقت للتلاميذ لقراءة الكتاب الذي يختارونه				
30	عند تدريس القراءة اعلم كيفية اللفظ الصوتي للكلمة				
31	أدرس التلاميذ الكلمات الجديدة بشكل دوري				
32	أساعد التلاميذ على فهم الكلمات الجديدة في القطعة التي يقرؤونها				
33	أطلب من التلاميذ الإجابة على اسئلة الفهم عما قرأوه في كتاب النشاط				
34	أطلب من التلاميذ في فصلي الكتابة عما قرأوه				
35	أطلب من التلاميذ الإجابة شفهيا او التلخيص الشفهي لما قرأوه				
36	أطلب من التلاميذ التحدث عما قرأوه في الصف				
37	أطلب من التلاميذ عمل بعض المشاريع عما قرأوه{مثل مسرحيات او رسوم.....}				
38	أعطي التلاميذ أختبارات قصيرة مكتوبة عما قرأوه				
39	أطلب من التلاميذ تحديد الفكرة الرئيسية للنص المقروء				
40	أطلب من التلاميذ شرح وتدعيم فهمهم للنص المقروء				

	العبـــــــــــارات	دائماً	غالباً	أحياناً	ابداً
41	أطلب من التلاميذ مقارنة ما قرأوه مع خبراتهم				
42	أطلب من التلاميذ مقارنة مقرأوه مع مواضيع سبق قرائتها				
43	أطلب من التلاميذ توقع ما سيحدث لاحقا في النص المقروء				
44	أطلب من التلاميذ بعض التعميمات و الاستنتاجات عما قرأوه				
45	أطلب من التلاميذ تحديد نوع النص المقروء {قصة ، مسرحية ، مقال.....}				
46	أقيس تقدم التلاميذ في القراءة من خلال الأختبارات الصفية				
47	أستخدم اسئلة الإختيار من متعدد في قياس تقدم القراءة لدى التلاميذ				
48	أسئلة الإجابات القصيرة المكتوبة تستخدم لقياس تقدم التلاميذ في القراءة				
49	أقيس تقدم التلاميذ في القراءة عن طريق قرأتهم جهريا				
50	أقيس تقدم التلاميذ في القراءة عن طريق الأسئلة الشفهية				
51	أطلب من التلاميذ تقرير او ملخص شفهي لما قرأوه لقياس تقدمهم في القراءة				
52	أطلب من التلاميذ كتابة قطع طويله عما قرأوه لقياس تقدمهم في القراءة				

Appendix F: TRSQ (students Form)

Reading Teaching Strategies Questionnaire (Students Form)

Student Name:..... School:.....grade.....class.....

No	Terms	Always	Often	Sometime	Never
1	I prefer to be taught reading individualized.				
2	I prefer to work independently on an assigned plan or goal.				
3	I prefer to choose my goals and work independently on them.				
4	I prefer to study using the textbook.				
5	I prefer to read reading series in class.				
6	I prefer working on a workbook or worksheets.				
7	I prefer reading children's newspapers and/or magazines.				
8	I prefer using computer software for reading instruction (e.g.,CD).				
9	In reading classes I read material on the internet (Web pages).				
10	In reading class I prefer to read a variety of children's books (e.g., novels, non- fiction, collections of stories, short stories).				
11	In reading classes I prefer to read material from other subjects.				
12	In reading classes I prefer to read material which has been written by classmates.				
13	I prefer to read short stories in reading classes.				
14	I prefer to read longer books with chapters in reading classes.				
15	I prefer to read poems and plays in reading classes.				
16	I prefer to read descriptions and explanations about things and people in reading classes.				
17	I prefer to read instructions or manuals about how things work in reading classes.				
18	I prefer to read charts, diagrams and graphs in reading classes.				
19	I prefer to use other material in reading class (e.g., some students prefer listening to astory).				
20	I prefer reading a loudly.				
21	I prefer to listen to students who are reading aloud.				
22	I prefer to read aloud in groups or pairs.				
23	I ask my teacher for help in sounding out or reading new words.				

	Terms	Always	Often	Sometime	Never
24	I ask my teacher about the meaning of the new words.				
25	I answer reading comprehension questions in my workbook or a worksheet about what I have read.				
26	In my reading class write about my reading.				
27	I answer oral questions or orally summarize about what I have read.				
28	I talk with my classmates about what we have read.				
29	I like to do a project about what I have read (e.g., a play or art project).				
30	I like written quizzes or tests about what I have read.				
31	I can identify the main ides of what I have read.				
32	I can explain or support my understanding of what I have read.				
33	I compare what I have read with my own experiences.				
34	I compare what I have read with other things I have read.				
35	I make predictions about what will happen next in the text I'm reading.				
36	I make generalizations and draw inferences based on what I have read.				
37	I describe the style or structure of the text I have read.				
38	Classroom tests reflect my reading progress.				
39	I prefer multiple choice questions on reading material.				
40	I prefer short- answer written questions on reading material.				
41	I prefer to read aloud to demonstrate my reading progress.				

إستراتجيات تدريس القراءة {نسخة الطالب}

الأسم : .... المدرسة:... الصف:.........................

عزيزي الطالب - عزيزتي الطالبه بين يديك إستبيان إستراتجيات تدريس القراءة. المطلوب قراءة العبارة جيداً ومن تقدير مدى تفضيلك لهذه الإستراتجية عندما تتعلم القراءة ومن ثم ضع بوضوح علامة {√} أسفل التقدير الذي ترى انه يناسب تفضيلك للإستراتجية اثناء درس القراءة.

م	العـــــــــــــــــــــــبارات	دائماً	غالباً	أحياناً	ابداً
1	أفضل تعلم القراءة بصورة منفردة				
2	أفضل العمل على واجبات القراءة وأهدافها بصورة منفردة				
3	أفضل اختيار أهدافي الخاصة أثناء تعلم القراءة والعمل عليها بصورة منفردة				
4	أفضل تعلم القراءة باستخدام الكتاب المقرر				
5	أفضل قراءة القصص المسلسة في الفصل				
6	أفضل العمل على كتب النشاط وأوراق العمل في حصص القراءة				
7	أفضل قراءة مجلات و صحف الأطفال أثناء تعلم القراءة				
8	أفضل استخدام الكمبيوتر وبرامج تعليم القراءة أثناء تعلم القراءة				
9	في حصة القراءة أفضل قراءة مواضيع من شبكة الإنتر نت				
10	في حصة القراءة أفضل قراءة كتب مختلفة موجهة للأطفال				
11	في حصة القراءة أفضل القراءة من مواضيع مختلفة {كالتاريخ أو العلوم ...				
12	في حصة القراءة أفضل قراءة مواضيع كتبت من قبل زملائي في الفصل				
13	أفضل قراءة القصص القصيرة في حصص القراءة				
14	أفضل قراءة الكتب الطويلة المكونة من فصول في حصة القراءة				
15	أفضل قراءة القصائد والمسرحيات في حصة القراءة				
16	أفضل قراءة المقالات التي تتناول وصف وشرح عن الأشياء و الناس في حصة القراءة				
17	أفضل قراءة كتيبات التعليمات و الارشادات عن كيفية عمل الأدوات				
18	أفضل قراءة الرسوم البيانية في حصة القراءة				
19	أفضل استخدام بعض المواد أثناء تعلم القراءة {مثلا البعض يفضل الاستماع للقصص }				
20	أفضل القراءة الجهرية بصوت عالي				
21	أفضل الاستماع للتلاميذ الآخرين عند قراءتهم بصوت عالي				
22	أفضل القراءة بصوت عالي مع الفصل أو الزملاء اثناء تعلم القراءة				
23	أطلب من المعلم مساعدتي في النطق و القراءة للكلمات الجديدة				
24	أسأل المعلم عن معاني الكلمات الجديدة				
25	أجيب عن أسئلة الفهم عما قرأته في الكتاب أو كتاب النشاط				
26	أكتب عما قراءته في حصة القراءة				
27	أجيب شفهياً أو ألخص شفهيا ما قرأته				
28	أتحدث عما قرأته مع زملائي في الفصل				
29	أفضل عمل مشروع عما قرأته {كعمل مسرحية أو رسوم }				
30	أفضل الاختبارات المكتوبة القصيرة عما قرأته				
31	أستطيع تحديد الفكرة الرئيسية عن الموضوع الذي قرأته				
32	أستطيع شرح ودعم ما فهمته أثناء القراءة				
33	أقارن ما قرأته مع خبراتي الخاصة				
34	أقارن ما أقرأه مع ما سبق أن قرأته				
35	أستطيع توقع ما سيحدث لاحقا في النص أثناء القراءة				
36	أستطيع عمل تعميمات واستنتاجات بناء على ماقرأته				
37	أستطيع وصف نوع النص الذي قرأته { قصة ، شعر، نثر، مسرحية....				

	العـــــــــــــــــــبارات	دائماً	غالباً	أحياناً	ابداً
38	الاختبار الصفي ونتائجه تعكس تقدمي في مادة القراءة				
39	أفضل أسئلة الإختيار من متعدد في مادة القراءة				
40	أفضل أسئلة ذات الإجابة القصيرة في مادة القراءة				
41	أفضل القراءة الجهرية لقياس تقدمي في مادة القراءة				

شاكر ومقدر حسن تعاونكم،،،،،

الباحث

Appendix G: Permission of educational department in Jeddah (Boy & girl)

المملكة العربية السعودية
وزارة التربية والتعليم - تعليم البنات
إدارة العامة للتربية والتعليم للبنات بمحافظة جدة
إدارة التخطيط والتطوير
البحوث التربوية

قال ﷺ [إن الله يحب الرفق في الأمر كله]
ميثاق أخلاقيات مهنة التعليم

الرقم: ٧٣٣ /١/٣د
التاريخ: ١٤ / ١٣ / ١٤٢٩هـ
المرفقات: ــــــــــ

الموضوع/ تسهيل مهمة الباحث/ إبراهيم عبده صعدي بجامعة فيكتوريا بأستراليا

المكرمة / مديرة المدرسة المتوسطة

المحترمة

السلام عليكم ورحمة الله- تعالى- وبركاته، وبعد:

إشارة إلى إحالة مدير التربية والتعليم بمحافظة جدة إلينا رقم ١/١٢٦٨ وتاريخ ١٤٢٩/١١/٢٨هـ للمعاملة رقم (بدون) وتاريخ ١٢ نوفمبر ٢٠٠٨ م والموجهة لسعادته من رئيس قسم التربية بجامعة فيكتوريا Victoria university البروفيسور "Maureen ryan" بشأن تسهيل مهمة المبتعث الباحث/ إبراهيم عبده صعدي في تطبيق أدوات بحثه للدكتوراه بعنوان (أساليب التعلم لدى الطلاب ذوي صعوبات القراءة في المدارس المتوسطة بمحافظة جدة – تطوير نموذج للتدخل) وذلك على عينة من المعلمات وعينة من طالبات الصفين الأول والثاني بمدرستكم خلال الفصل الدراسي الثاني ١٤٢٩-١٤٣٠هـ ، وسيعث الباحث مندوبة عنه للقيام بشرح كيفية الاستجابة لأدوات البحث (مقاييس- استبانات) .

- وبناءً على مطابقة أدوات البحث لضوابط وتوجيهات الوزارة ، وحيث وافق سعادته للباحث على تطبيق إجراءات بحثه على عينة من المدارس المتوسطة للبنات بجدة .
- عليه نأمل منكم التعاون مع مندوبة الباحث إليكم وتقديم ما يلزم لمساعدتها .

شاكرين ومقدرين تعاونكم ،،،،

مديرة إدارة التخطيط والتطوير
١٤٢٩/١٢/٤
نور بنت سعيد باقادر

ع / فقان

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التربية والتعليم
الإدارة العامة للتربية والتعليم (بنين) بمحافظة جدة
(٢٨٠)
(تعليم جدة)
وحدة التخطيط و التطوير التربوي

وزارة التربية والتعليم
MINISTRY OF EDUCATION

الرقـــم : ٦ /٢ / ٩
التاريــخ : / / ١٤٢٨هـ
شعبة : البحوث التربوية
المرفقات :

الموضوع : تسهيل مهمة باحث

اسم الباحــث :ابراهيم عبده الصعدي
عنوان البحث : اساليب التعلم لدى الطلاب ذوي صعوبات القراءة في المدارس المتوسطة بمحافظة جدة . تطوير نموذج للتدخل
الجهـــــة : جامعة فكتوريا – استراليا
مجتمع البحث : معلمي اللغة العربية بالمرحلة المتوسطة ، وطلاب الصف الأول متوسط والثاني متوسط
أداة البـــحث : إستبانه

سعادة / **المحتــرم**

السلام عليكم ورحمة الله وبركاته ، وبعد:

بناءً على توجيه سعادة مدير إدارة التربية والتعليم بمحافظة جدة بشأن السماح للباحث الوارد اسمه اعلاه بإجراء دراسته على عينة من مجتمع الدراسة المشار اليه ، أمل مساعدة الباحث على تطبيق أداة بحثه مالم يكن هناك ما يمنع نظاماً ، علماً بأن الباحثة تتحمل المسؤولية المتعلقة ببحثها .

وتقبلوا تحياتي ،،،،،،،،،

[redacted]

مدير إدارة التربية والتعليم بمنطقة مكة المكرمة
[redacted]
عبدالله بن أحمد الثقفي
١٢/١٩

ص / لوحدة التخطيط والتطوير