



**Teachers' Perceptions about Dyslexia and Intervention with  
Students at Risk of Dyslexia in the United Arab Emirates  
(UAE) Schools**

تصورات المعلمين عن عسر القراءة والتدخل لدى الطلاب المعرضين لخطر عسر  
القراءة في مدارس دولة الإمارات العربية المتحدة

by

**NORA BENKOHILA**

**Dissertation submitted in fulfilment  
of the requirements for the degree of  
MASTER OF EDUCATION  
at  
The British University in Dubai**

**August 2018**

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## **ABSTRACT**

Research proved that raising the phonological and phonemic awareness among students may help students at risk not to be future dyslexic. Moreover, teachers awareness play a vital role in identifying students with dyslexia and help them to apply the suitable intervention for students with dyslexia. Therefore, the objective of this study was two-fold as follows: a) teachers in UAE awareness about dyslexia and the appropriate use of intervening measures to serve students with dyslexia, and b) the teachers awareness influence on intervention quality with students with dyslexia

A convergent parallel mixed methods design was adopted to collect data, 29 teachers participated in answering the questionnaire designed for quantitative data collection, and at the same time a case study was conducted to qualitatively provide insights into the context from an intervention with a dyslexic student.

Findings indicated that while teachers expressed fair understanding of dyslexia as a reading disability, they expressed confusion about traits of dyslexia. Also, teacher's awareness about dyslexia may positively impact identifying and serving students with dyslexia. Furthermore, raising the phonological and phonemic awareness of the student with dyslexia in the case study showed amazing results.

Recommendations for practice and future research were discussed in this study

## نبذة مختصرة

أثبتت الأبحاث أن رفع الوعي الصوتي والفونيمي (الصوتي) يعدّ عاملاً أساسياً في مساعدة الطلبة الذين يواجهون خطر عسر القراءة. كذلك يلعب وعي المعلمين دوراً حيوياً في تحديد الطلبة الذين يعانون من عسر القراءة وكذلك تطبيق برامج التدخل المناسبة لهم. ولذلك كان هدف هذه الدراسة في شقين كالآتي: لتحري: (أ) وعي المعلمين حول عسر القراءة والاستخدام المناسب لتدابير التدخل لمساعدة الطلبة الذين يعانون من عسر القراءة في مدارس الإمارات العربية المتحدة، و (ب) تأثير وعي المعلمين على جودة التدخل مع الطلبة الذين يعانون من عسر القراءة.

تم اعتماد التصميم المتوازي المتقارب لأساليب البحث المختلطة لجمع البيانات؛ وشارك 29 معلماً في الإجابة على الاستبيان المصمم لجمع البيانات الكمية، وفي الوقت نفسه تم إجراء دراسة حالة لتوفير معلومات في السياق من خلال التدخل مع طالبة تعاني من عسر القراءة.

أشارت النتائج إلى أنه في حين عبر المعلمون عن فهم مقبول لعسر القراءة كإعاقة في القراءة، لكنهم أعربوا عن الارتباك حول سمات عسر القراءة. كما أظهر رفع الوعي الصوتي والفونيمي للطلبة المصابة بعسر القراءة في دراسة الحالة نتائج مذهلة.

وتمت في هذه الدراسة مناقشة التوصيات للممارسة والبحوث المستقبلية.

## **ACKNOWLEDGEMENT**

This piece of work would not have been possible without the support and compassion of many people.

I gratefully acknowledge the support of my husband and my two kids who were very supportive and tolerated many hours during which I wished I was with them.

I am most grateful to my beloved parents who never stopped encouraging me till the last moments; my brothers and sisters for their love and sympathy, and especially Amel who really did a lot for me.

I wish to thank Pr. Eman Gaad as well as my lecturers in the British University in Dubai who added a lot to my knowledge.

And finally, of course I could not have done this study without the help and cooperation of Rose and her classmates especially N and C; my colleagues in the university who helped in the distribution of the questionnaire, and all the teachers who took part in my study.

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## **LIST OF ACRONYMS**

**CWPM:** Correct words per minute

**UAE:** United Arab Emirates

**SEN:** Special Educational Needs

# **Chapter One: Introduction**

## **1.1 Overview**

Inclusion means that students with learning difficulties including dyslexia study in the same classrooms with same-age peers. Consequently, more students with special educational needs nowadays spend the majority of their day in general education classrooms (Voltz, Sims & Nelson 2010).

Basically, regular teachers cater to the majority of SEN students including those with dyslexia in mainstream schools. Unfortunately, many regular teachers tend to have neutral or negative attitudes towards the inclusion of these students in general education. General education teachers do not seem to have sufficient information about the disorder (Gwernan & Burden 2010), which in return influence their teacher efficacy (Woolfson & Brady 2009).

Many researchers connected between teachers' awareness about disabilities, teachers' attitudes towards inclusion, and teacher efficacy (Berry 2010), and if general educators lack information about dyslexia, this can result in lower teaching efficacy in the inclusive classroom as highlighted (Berry 2010), which causes in return that students with dyslexia remain underserved in such settings.

Dyslexia is often seen as a hidden disability and the estimates from a range of sources suggest that 10-15% of the population have dyslexia and around 4-5% severely (Reid 2016). Students with dyslexia struggle with reading, spelling, and writing and experience reading difficulties in general.

In UAE, figures related to the number of students with dyslexia are not available, however, and after conducting a free dyslexia screening for about 475 students across 15 schools in Dubai by Lexicon Reading Center, the results revealed that 65% of those students were at high risk of dyslexia and 17% were at mild- to- moderate risk (Gulf News 2016).

Unlike in Kuwait for example, there is no governmental organization that leads researches or statistics about dyslexia in UAE, thus the prevalence of dyslexia in this young country is still not officially known, though, there is no reason to assume the prevalence of dyslexia in the UAE to be below the global average of five to eight percent as says Rudolf Stockling; clinical director at Lexicon Reading Center to Khaleej Times.

Students with dyslexia share a phonological linguistic deficit (Catts, Fey, Zhang & Tomblin 1999). This deficit can be noticed very early when children manifest difficulties in learning sounds, letters, rhymes compared to their peers. If these children are identified early and necessary measures are taken accurately, they will be safe from being at risk with reading difficulties. However if the case is the opposite they might suffer from reading difficulties throughout their entire lives.

People interest in individuals manifesting reading difficulties began in 1878, it was the German neurologist, Adolph Kussmaul who coined the term word blindness to describe the difficulties some patients encountered while reading common words in the wrong order (Kormos & Smith, 2012: 6, cited in Kaperoni, p. 2016). In 1887 the German pathologist, Rudolf Berlin was the first to use the word “dyslexia” in place of word blindness. The word dyslexia [has been coined from the Greek and literally means difficulty with (dys) words (lexis)] (Politt, Pollock,Waller, 2004, p. xiii). In 1925, an American neurologist Dr. Samuel proposed the first theory of how specific reading difficulty occurs by studying the brain functions, in mid- twentieth century, educational and psychological research began to accumulate and connect specific literacy difficulties to concepts of child development and cognitive abilities.

This study explored teacher knowledge about dyslexia and intervention with students who are at risk of dyslexia in the UAE schools. The chapter is organized based on the following sections: (1) Rational background of the research, (2) statement of the problem, (3) purpose of the study, (4) research questions, (5) significance of the study, (6) limitations of the study, and (7) definition of key terms.

## **1.2 Rational Background**

Starting from the initiative of No Child Left behind Act, children with learning difficulties including those with dyslexia gained the right to be identified early and to receive necessary intervention programs accurately in regular education classrooms with same-age peers. Studies confirmed that early identification as well as accurate intervention has good results on students who are at risk of dyslexia, as intervention is better than remediation.

Teacher efficacy is a necessary tool that general teachers should possess to help SEN ( Al Otaiba, Connor, Foorman, Schatschneider, Greulich & Sidler 2009)found out after conducting several observational and experimental studies, that the least effective teachers deliver whole group instructions, and all children receive the same materials. Early identification should be linked to effective intervention programs before a downward spiral of underachievement, lowered self-esteem and poor motivation sets in. (Snowling & Stackhouse 2013).

Children who are at risk of dyslexia manifest difficulties with phonological awareness: a set of skills and explicit understanding of the different ways in which spoken language can be broken down and manipulated. (Washburn, Joshi & Binks –Cantrell 2011). They also demonstrate deficit with phonemic awareness which is the ability to recognize the phonemes (sounds) in the word.

Many countries adopted national interventions programs to help children who are risk of dyslexia, in US an approach called RTI (Response to intervention) (Simos et al. 2007), was adopted; it is a program of intervention through which the literacy progress of a group of children is monitored, with RTI, early intervening services are provided from struggling beginning readers before they fall farther and farther behind their peers ( Al Otaiba, Connor, Foorman, Schatschneider, Greulich, & Sidler 2009). In the UK, children in the foundation stage (from 3 years to 5 years) are screened for language and a literacy difficulty, through the Early Foundation Stage Profile (EYFSP), then literacy intervention is carried out for students identified as poor readers, that program was introduced officially in 2003 (Snowling 2013). Although dyslexia was not formally recognized as a disability only in 2007, New Zealand Ministry of Education was adopting a national early intervention program developed by Clay (2005a, 2005b), called Reading Recovery (RR), this

program was implemented to help children who have learning difficulties to read after a year of reading instructions (Tunmer, Greaney2010). The Reading Recovery Program consists of 30 minutes remedial session on a daily basis through 12 to 20 weeks.

In UAE, the Federal Law No. 29 issued in 2006 aimed at protecting the rights of people with disabilities including the right to education. However, it was only in 2010 when a practical initiative called “School for All” was launched and it provided (General Rules for the Provision of Special Education and Programs and Services) for both private and public schools (Moe, 2010). The initiative included dyslexia under the category of special learning disabilities and not as a separate category like visual impairment, autism spectrum disorders, or emotional and behavioral disorders. The rules did not implement specific interventions programs for dyslexia rather broad and general instructions for screening and referral of students with disabilities, so it is left to the school to tailor its own intervention program for students with dyslexia.

The absence of a national intervention program for dyslexia in any country may have negative impact on students at risk of dyslexia. And since dyslexia is a hidden disability, dyslexic students may go unnoticed from a year to another till they reach university level.

### **1.3 Statement of the Problem**

Thanks to inclusion more children with dyslexia are studying in mainstream classrooms, and they are served most of the time by general education teachers. However, teachers still lack knowledge about dyslexia (Bell 2013), which can affect intervention and teaching efficacy.

A large number of young students with dyslexia find reading, writing and spelling very difficult (Mullis, Martin, Kennedy & Foy 2007), and since these tasks are considered as essential in academic achievements, as well as a key to success in a working life demanding for learning new things and adapting to new technology (Lundberg 2010).Therefore, early diagnose and early intervention to help students with dyslexia is more than a necessity in this demanding world.

UAE as a young country and compared to other countries in the region has stepped large strides in special and inclusive education. However, and as far as dyslexia is concerned, research is very



scarce and so is literature, due to the absence of a clear national program that deals with dyslexia in UAE. So lots of research about dyslexia in UAE context is needed.

#### **1.4 Purpose of the Study**

The absence of clear special programs and resources of intervention with students with dyslexia in the UAE leads to the question if the regular teachers are qualified enough to satisfy the needs of students with dyslexia. Besides, it is not clear whether the dyslexic students benefit from inclusive setting or not, so there is a need to showcase what is happening in these classrooms.

The literature review indicates that research on dyslexia in the UAE is still very scarce, also the need of research on the perspectives of regular teachers in inclusive classrooms is still required as emphasized (Smith & Smith 2000)

The chosen research topic tries to fill these research gaps and to shed light on teachers' perceptions about dyslexia in the UAE schools, and whether they are well equipped with the necessary knowledge and information to deal with students with dyslexia in their classrooms, and at the same time it draws to the researcher's personal experience as a regular teacher and how she dealt with a student with dyslexia before and after taking courses about dyslexia as a part of obtaining a master degree in special and inclusive education. Therefore, the objectives of this study are twofold: to investigate: a) teachers in UAE awareness about dyslexia and the appropriate use of intervening measures to serve students with dyslexia, and b) the teachers awareness influence on intervention quality with students with dyslexia. By using a mixed method approach, the researcher was able to compare and integrate main findings from a circulated questionnaire with her own experience drawn from the case study. It is hoped that the findings of this research will be of great interest not only to teachers and parents of students with dyslexia but also to draw the attention of education policymakers to implement a clear and practical program convenient to students with dyslexia in UAE schools.

## **1.5 Research Questions**

To achieve the purposes set for this piece of work the following research questions have been set:

Are teachers in UAE aware of dyslexia and using appropriate intervening measures to serve students with dyslexia? (to what extent are teachers in UAE knowledgeable about dyslexia?) answered through the questionnaire

To what extent does teacher's awareness influence intervention quality with students with dyslexia? (how does teacher's awareness about dyslexia reflect on intervention on students with dyslexia?)

To what extent and in what ways does a case study on intervention with a student with dyslexia serve to contribute to a more comprehensive understanding of the relationship between teacher's knowledge about dyslexia and successful intervention with students who are at risk of dyslexia?

## **1.6 Significance of the Study:**

Although research about special education and inclusion has been increased in the UAE recently, literature and research about dyslexia is still scarce. Besides mastery of reading and writing in English becomes an important necessity in the UAE and all over the world, due to the dominance of the English language either in the UAE or elsewhere. Therefore it is important to tackle problems hindering the acquisition of English among young learners.

This study is unique as it explores the effect of teachers' knowledge about dyslexia in the UAE and its relation to provide an effective intervention remedy for students with dyslexia and at the same time the case study provides the researcher's own insights by undergoing the experience of intervention herself.

The results of the study can be useful for homeroom and language teachers in general and for education policy makers in particular. Finally, this study can contribute even slightly to literature about dyslexia in UAE.

## 1.7 Definition of Terms

**Phonics:** A method of teaching reading by concentrating on the sounds associated with specific letters or groups of letters (The Oxford Companion to the English Language, 05/2018).

**Phonological Awareness:** is the phonological processing ability most strongly related to literacy. It encompasses *phoneme awareness*, the ability to manipulate individual sounds (phonemes) in words, and rudimentary phonological skills, such as judging whether two words rhyme (Anthony & Francis 2005)

**Phonemic Awareness:** the ability to manipulate individual sounds (phonemes) in words (Anthony & Francis 2005).

**Literacy:** refers to the ability to read for knowledge, write coherently, and think critically about the written word (Wikipedia, the free encyclopedia)

**Fluency:** (also called volubility and loquaciousness) is the property of a person or of a system that delivers information quickly and with expertise ( Wikipedia, the free encyclopedia)

## **2 Chapter Two: Literature Review**

### **2.1 Introduction**

The purpose of this convergent parallel mixed methods study was to explore to what extent are general teachers in the UAE knowledgeable about dyslexia and the relationship between teachers awareness about dyslexia and intervention with students with dyslexia in the inclusive classrooms in the UAE schools. Data was collected through the distribution of a questionnaire through a random sampling and in parallel a case study was executed by the researcher in her classroom with a student with dyslexia. Through the use of quantitative data exemplified in the questionnaire, an exploration of how general teachers in inclusive classrooms do perceive dyslexia and to what extent is intervention linked to awareness which in return may contribute to better serving students with dyslexia in the UAE schools. The qualitative data gleaned from the case study was used to validate the quantitative data emerged from the questionnaire.

The literature review contains information from education experts and scholars from universal journals. The literature review begins with the theoretical framework, inclusion in the UAE, different concepts of dyslexia, intervention with students with dyslexia. Misconceptions about dyslexia were also discussed in the literature review.

The literature was compiled using Eric, EBSCO host, Google scholar, Proquest, and sage journal. Searches were conducted using terms related to teacher knowledge about dyslexia such as: teachers' awareness about dyslexia, intervention with students with dyslexia, inclusion in the UAE, dyslexia in the UAE, and teacher perception about dyslexia.

### **2.2 Theoretical Framework**

The philosophy of inclusion is underpinned on the idea that all students regardless of their abilities/disabilities should get their learning needs met in schools. In order to meet students' different learning needs, schools need to change their practices (Kinsella & Senior 2008). Crow (2010) believes that inclusion is a difficult attempt and it requires an important change to facilitate progress in the way teachers have been performing in the classroom.

Inclusion requires more than the placement of students with different learning needs in general education. Sharma, Loreman and Forlin (2012) highlighted the importance of preparation and training of new graduate teachers to effectively include all students into mainstream classrooms despite of their individual needs. Teachers who can provide effective learning tools for students with dyslexia need training (Woolfson & Brady 2009). Peers assigned to help students with dyslexia should also have a careful training before executing this help, this means that the peer tutor must be taught how to provide assistance by modeling and explaining, how to give specific positive and corrective feedback, and when allow the student to work alone (Slavin 2006, p. 332).

The Vygotskian perspective in education is to keep learners in their Zone of Proximal Development stated Roosevelt (2008), by providing them with interesting tasks that are slightly difficult, so that they will need to work with a teacher or a more competent peer to finish the work. By doing so the learner will be able to finish the same task by himself next time, consequently the learner's zone of proximal development for that specific task will be raised.

The concept of the Zone of Proximal Development implies that only information as well as learning activities that fall within this zone can be assimilated. The teaching content that is too easy or too difficult does not add to learning (Slavin 2015, p. 39)

Vygotsky's theory of Zone of Proximal Development has an important implication of the importance of teacher's knowledge as well as high performing peers in the teaching process.

Lev Semenovich Vygotsky developed the concept of Zone of Proximal Development during the 1920's, he defined it as: the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (p.86), the concept is that individuals learn better when collaborating with more skilled adults or high achieving peers. He believed that learning is most effective when learners are working within their zone of proximal development.

Slavin (2006) explained: ‘tasks within zone of proximal development are those that a child cannot yet accomplish alone but could accomplish with the assistance of more competent peers or adults’ (Educational psychology, p.39).

The Zone of Proximal Development was chosen as a theoretical framework for this research due to the importance of adults/teachers as well as high achieving peers in teaching students with learning difficulties in general and more specifically students with dyslexia in general classrooms. Roth and Lee (2007) highlighted that tutoring carried out by more competent peers can promote effectively growth within the Zone of Proximal Development.

The present study focuses on the importance of a knowledgeable teacher about dyslexia as well as the crucial assistance of volunteer peers to help students with dyslexia.

### **2.3 Inclusion in UAE**

Due to inclusion children with disabilities have been granted the opportunity to study in mainstream classrooms, before those children were subject to exclusion from schools, inequity, and lack of opportunity.

Inclusion is a buzzword that is being frequently used by education policymakers in the UAE and throughout the world. Inclusion means that all children whether with disabilities or without have the right to learn with their same age peers in general education classrooms.

Despite the fact that the UAE is a young country, since it was established only in 1970, the UAE has stepped big strides towards inclusion, this achievement is exemplified in many laws and regulations that the UAE authorities issued to organize the implementation of inclusion within the Emirati private and public schools.

The Federal Law (29/2006) for (The Rights of People with Special Needs) granted the right of education to students with disabilities in both private and public schools, after that it was the

Federal Law (14/2009) for (The Rights of People with Disabilities) followed by the UAE Ratification of United Nations, Committee on the Rights of Persons with Disabilities (116/2009), then it was “School for All” (2010) for Special Education Programs and Services. These laws concretized the UAE policymakers’ strong will to implement inclusion of students with disabilities in regular education classrooms.

The UAE directions in this regard were in accordance with the international movement towards inclusion that took effect after the Salamanca Statement for inclusion at UNESCO World Conference on Special Educational Needs that was held in Spain in 1994. Inclusion is a hot issue in the agenda of the UAE authorities, and schools across the country are trying their best to meet inclusion requirements set by the Ministry of Education, KHDA (Knowledge and Human Development Authority) and ADEC (Abu Dhabi Education Council). However, and despite of the laws and regulations issued in the UAE in favor of inclusion, still covert inclusion persists when including students with special educational needs in general education classrooms physically, but in fact they are excluded emotionally and on curricular basis. Alborn and Gaad (2014) highlighted the fact of the absence of special curricula in the most of the UAE schools; instead there exist “paracurricula” for teaching students with special educational needs as mentioned by Arif and Gaad (2008).

Bradshaw, Tennant, and Lydiatt (2004) reported that private schools in the UAE do not have specific categorical system for identifying and supporting students with special educational needs. On the other hand public schools have “front-line resource” exemplified in counselors who are responsible for identification and referral of students who are doubted to have special educational needs. Unlike students with clear disabilities such as “Down Syndrome” students with dyslexia cannot be identified easily, as identification procedures do vary from a school to another and between private and public schools. Many of private schools in the UAE do not possess appropriate assessment resources for students with SEN due to shortage of funding reported Gaad and Khan (2007), which leads to the fact that students with dyslexia remain unnoticed and consequently underserved in general education classrooms. Alghazo (2005) reported that many students are not diagnosed according to proper assessments that are designed to categorize them.

However, public schools in the UAE and in contrast to private schools focus more on early intervention within students with SEN, as each school has its own specialized team that include psychologists, speech language pathologists, school doctor, ..etc, due to the generous funding provided by the government.

## **2.4 Diagnosis of Dyslexia**

Early research findings reported that language deficits were associated with injuries in different parts of the brain. In the early nineteenth century it was claimed that speech production and comprehension impairment can be caused due to an injury in human brain, at that time these impairments were termed as “aphasias”, Broca (1861) claimed that a particular part in the frontal convolutions in brain as responsible for speech and that a lesion to that part can cause aphasia, this area was named after him as Broca’s area. Then it was “word deafness” and “word blindness” introduced by Kussmaul (1878) to refer to cases of acquired reading disability in adult patients who could not read in spite of normal sensory acuity and average intellect (Anderson & Meier-Hedde 2001). Kussmaul (1878) stated that the linguistic ability is in a section of the left hemisphere of the human brain; his contribution was the turning point in research about dyslexia, as researchers increasingly shifted to the study of reading problems instead of aphasia.

In 1917, Hinshelwood suggested that word blindness had hereditary as well as gender tendency, as an ophthalmologist, Hinshelwood was the first to argue that word blindness was associated with a visual defect that is caused by a damage in the visual-word- centre in the brain. Hinshelwood’s work had considerable gains in identification of word blindness, remedial reading assistance, and implication of hereditary tendency.

Orton (1937), the American neuropathologist proposed the word “developmental” instead of “congenital” and offered a variant explanation of the reading difficulty, he reported that the causes of the impairment are due to a deficit in a physiological development and emphasized on the phonemic awareness, also he stated that these difficulties may manifest in the presence of letter reversals when people with difficulties get confused with letters such as “b” with “d” and “q” with “p”, and suggested the “kinetic reversals” eg. “was” as “saw”. Orton (1937) attributed reading



disorders to a lack of cerebral dominance and suggested the condition of “strephosymbolia” or “twisted symbols” which is due to a failure in establishing dominance in one hemisphere of the brain. Orton’s theory that faulty cerebral dominance as a cause of disability is invaluable today, also as per the current notion misspellings and letters appearing in the wrong and reverse order do not necessarily suggest a visual component (Miles & Miles 1990), however, still Orton is regarded as a pioneer who inspired educators to carry out research on remedial assistance to children struggling with reading.

The establishment of the “Word Blind Center” in London in the 1960’s offered a good progression in understanding dyslexia in Britain. The center offered diagnosis and teaching assistance for children with dyslexia. Another achievement in the field of dyslexia was concretized by the inclusion of dyslexia in the British legal system, followed by the foundation of the British Dyslexia Association (BDA) in 1972.

The discovery of phonological deficit theory in the 1980’s shifted the focus of dyslexia research from visual to language processing. Substantial research offers evidence to reinforce the phonological deficit hypothesis and the difficulties connected to phonological awareness, decoding, and processing (Beaton et al. 1997; Bruck 1993; Fawcett & Nicholson 1996, Snowling 2000; Everat et al. 2004). The phonological deficit hypothesis is still acknowledged among the dyslexia community; however, many significant theories have emerged and contributed to give a clearer picture of dyslexia and its manifestations, but on the other hand these numerous theories and incongruous findings made dyslexia research a confusing field as stated Nicholson (2008).

## **2.5 Teachers’ Knowledge about Dyslexia**

Due to inclusion more and more students with special educational needs are studying in general education classrooms, So general education teachers are more responsible for students with dyslexia in inclusive settings as highlighted Harr-Robins et al. (2012), and it is the teachers’ responsibility to get their educational needs met in mainstream classrooms in order for them to succeed academically.

In order for general teachers to get the needs of students with dyslexia satisfied, they have to be knowledgeable about dyslexia and its traits as well as effective intervention methods to get better results with students with dyslexia. Also they have to possess good knowledge of basic language concepts such as phonology, phonics and morphology. In a study carried out by Washburn, Joshi, Binks –Cantrell (2011) with the purpose to explore elementary teachers' (K-5) knowledge of basic language concepts and dyslexia. A survey that is previously used by other researchers was used in this study. 185 elementary teachers from Midwestern and Southwest in USA, teaching from kindergarten to fifth grade were recruited to answer the questionnaire. Both SPSS and AMOS were used to analyze data emerged from survey. The study is limited due to the fact that sampling was of convenience and not done systematically, also data was based on self-report measure which is subject to social desirability bias. Findings showed that teachers on average lack explicit knowledge about various important concepts required in teaching struggling readers, also teachers share common misconception that dyslexia main deficit is visual rather than phonological, this misconception alone could limit that students with dyslexia receive the necessary and adequate instruction and intervention. The researchers recommended that it is imperative that elementary teachers especially those teaching (K-5) should receive information about the language concepts.

Teachers report their lack of knowledge as well as experience in dealing with students with dyslexia, Ness and Southall (2010). In their study, Ness and Southall (2010) intent was to explore how well teacher education coursework prepare preservice teachers in dealing with students with dyslexia in their classrooms. The researchers prepared a researcher –designed open- ended survey and the participants were 287 preservice teachers from the universities of Alabama, Virginia, and New York, the majority of the participants was in their course of study and had completed at least one semester long course in special education. The questionnaires asked questions about dyslexia definition, traits and identification of students with dyslexia, suggestion of instructional support methods for students with dyslexia, and identification of experiences that have influenced their beliefs about dyslexia. Graduate assistants were responsible for the distribution of the questionnaires to minimize the effects of researcher presence. The principles of the grounded theory were used to analyze the qualitative data. The study is limited due to the self-reporting which might be biased. Results of the study indicated that the majority of participants do not

possess the conceptual knowledge base to recognize, diagnose or remediate students with dyslexia; the study suggests meaningful hands-on experiences, case studies, and field placements focusing on students with dyslexia. The study is significant in that it has important implications for teacher training and ongoing professional development.

Another study whose findings came in line with the above mentioned studies, in that elementary teachers in general lack knowledge about dyslexia as well as awareness about the early signs of dyslexia among students, the study was conducted by Al Adwani and Al Shaye (2012) to explore primary teachers' knowledge and awareness about dyslexia in Kuwaiti schools, the participants were 75 teachers from 12 public schools across six educational districts in Kuwait. The main purpose of the study was to investigate Kuwaiti primary teachers' knowledge of the early signs of dyslexia, also if they were trained on dealing with students with dyslexia and whether they are able to diagnose and identify the early signs of dyslexia among their students. Both SPSS and ANOVA were used to analyze data emerged from a survey administered to the participants. Although the researchers did not acknowledge the study limitations, yet the study is limited since the teachers self-reported their responses, also it was a small study with only 75 participants. The findings gleaned from the study indicated that language teachers in general lack knowledge about dyslexia and showed a very low level of awareness regarding the early signs of dyslexia and lack training about dealing with students with dyslexia in their classrooms. The recommendations focused on the necessity of training teachers about dyslexia and updating their information with innovative teaching methods.

## **2.6 Theories of Developmental Dyslexia**

Up to date there is no consensus amongst researchers about describing this disability. The international Dyslexia Association defined dyslexia (2002) as: Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. (Reid 2016, p. 8). Dyslexia is also identified as a language based disability that is characterized by difficulties with reading, spelling, writing, and processing at any level of intelligence (Tanaka et al. 2011). Other traits of dyslexia include difficulty with linking letters with sounds, rhyming, recognizing simple words, hearing

individual sounds, word reversals, letter reversals, issues with articulation, pronunciation problems and issues with word-retrieval (Lyon & Shay Witz 2003). Yet it can be argued that there is still no clear explanation that is universally accepted of what constitutes dyslexia (Reid 2016).

Dyslexia was defined in terms of clinical framework by medical professionals until the discovery of “congenital word blindness”, and then the research was shifted toward examining the differences between dyslexics and non-dyslexics. So the research on dyslexia involved medicine, psychology, and pedagogy. Scholars from different disciplines produced different explanations to the causes of dyslexia as well as different definitions and consequently they targeted different audiences indicated Miles (1995).

Frith (2002) suggests that dyslexia is a neuro-developmental disorder with a “biological origin and behavioral signs which extend far beyond problems with written language” (p.45, cited in Reid 2016, p. 18). Morton and Frith (1995) developed the Causal Modeling Framework which considers the numerous theories of developmental dyslexia and categorizes them into three levels: a- biological, b- cognitive, and c- behavioral, it incorporates the neurological dimensions, cognitive/learning dimensions and the educational dimensions. The Causal Modelling Framework lead to a clear understanding of different features contributing to dyslexia. This classification acts as a guide for researchers from different disciplines.

Environment	Biological
	Cognitive
	Behavioral

Figure 1 The three-level causal modelling framework Frith (1999 in Reid 2016)

## **2.6.1 The Cognitive Level**

### **2.6.1.1 The Phonological Deficit Hypothesis**

Lots of researchers attributed the cause of dyslexia to phonological deficits, and a huge amount of data supported the hypothesis of phonological disorder as a core factor of reading deficits (Bishop & Snowling, 2004; Ziegler & Goswami, 2005; Blau et al, 2010). The phonological deficit affects phonological awareness, phonological short-term memory, and slow lexical retrieval ability. These main cognitive abilities are the manifestations of dyslexia as explained by Ramus and Szenkovits (2008). Throughout phonological processing children link the speech they hear (phonetic input) with the utterance they produce (phonetic output) (Snowling 2008). The advocators of the phonological deficit hypothesis claim that individuals with dyslexia have difficulty with phonological awareness which is a fundamental prerequisite for reading skill. According to Snowling (2008) persons with dyslexia are slow in developing phonemic analysis skill; consequently they underperform in tasks requiring phonological awareness.

Although the phonological deficit hypothesis was recognized as significant in explaining dyslexia, increasing evidence claims that it cannot fully explain the causes of dyslexia, as there is a consensus amongst researchers that not all poor readers have deficits in phonological processing (Stein, 2004), and many researchers argue that other causes such as visual processing and auditory processing might have a great impact on reading acquisition.

### **2.6.1.2 The Double Deficit Hypothesis**

The Double Deficit Hypothesis accounts dyslexia to phonological deficit as well as visual processing deficit. Compton et al. (2001) claims that reading impairment is resulted from Rapid Automatized Naming (RAN) besides to phonological processing.

Van der Leij and Van Dall (1999) reported that children with dyslexia have difficulty in automatizing word recognition skills. Wolf and Bowers (1999) suggested an alternative conceptualization of developmental dyslexia which was a suggestion of three groups of reading disabled: a) those with phonological deficit; b) those with speed deficit and c) those with both

phonological and speed deficit. Wolf emphasized both speed of processing and phonological awareness; he also argued that phonological awareness remediation should be accompanied by reading fluency among individuals with dyslexia. However, advocates of the Phonological Deficit Theory like Vellutino et al., (2004) report that the Double Deficit Hypothesis did not provide anything new due to the fact that reading fluency cannot be achieved with impaired phonological skills.

### **2.6.1.3 The Phonological Representation Hypothesis**

Hulme & Snowling (1992) proposed that phonological deficit in individuals with dyslexia may occur due to difficulties in establishing and accessing phonological representations. During the process of reading, a sound-based representation of the written words is created in the working memory and consequently in the long term memory. So, inadequate information storage of phonological information leads to inaccurate applications of sound rules during reading. Individuals with dyslexia can read words that they come across frequently but not nonsense or unfamiliar words because they depend on how graphemes are phonemically represented in their long term memory. Consequently, the reading development of individuals with dyslexia is restricted, also due to poor storage, they underperform while reading unfamiliar or nonsense words (Olson et. al; 1889, Snowling 1981).

The Phonological Representation Theory was criticized by Ramus (2001) who described it as insufficiently tested, additionally; Nicolson (2008) claimed that this theory is limited as it did not consider the full range of dyslexia symptoms.

### **2.6.1.4 Automaticity Hypothesis:**

Automaticity is the process by which learning and response become automatic. Nicolson and Fawcett (1992) reported that children with dyslexia show problems in gross motor skills of balance in addition to phonological and/or visual deficits, in their study they reported that children with dyslexia encounter significant difficulties when performing dual tasking which is a strong indicator for individuals with dyslexia who are striving to make sense of more than one linguistic structure.

Automaticity is indispensable for effective learning and it should be initiated to have effective learners.

## **2.6.2 Biological Level**

### **2.6.2.1 The Rapid Auditory Processing Hypotheses**

The Rapid Auditory Processing Theory supports the idea that auditory processing among individuals with dyslexia is impaired; Tallal (1980) indicated that basic auditory deficits occur when short or rapidly changing sound is perceived. There was considerable evidence that suggested a causal connection between auditory deficit and dyslexia reported Goswami (1980). The advocates of this theory claimed that basic auditory deficit is the cause of developmental dyslexia; Galaburda (1999) highlighted that deficit in auditory temporal processing is the main cause of phonological problems among individuals with dyslexia.

The inability to hear well leads to the inability to discriminate between phonemes and this in turn hinders the ability to recognize the word structure which finally restricts the phonological skills, and as a result the reading accuracy cannot be achieved. Several studies advocated this theory because of poor performance in many auditory tasks amongst individuals with dyslexia Stein (1996). Also MRI as well as brain anatomical evaluation proposed auditory deficit among dyslexics as highlighted Leonard et al. (2001). However, many views opposed this theory arguing that not all dyslexics have auditory dysfunctions, thus they cannot be accounted as the primary cause of dyslexia. As stated by Ramus et al., (2003) phonological development among individuals with dyslexia is not linked to auditory deficits, since only 39% of dyslexics were found to have a deficit in temporal processing (Snowling & Bailey, 2001). Therefore auditory dysfunctions have little influence on phonology development and are not the main cause of dyslexia.

### **2.6.2.2 The Visual Deficit Hypothesis**

Since reading involves looking at print, it is necessary to look at factors involved in visual dysfunction, highlighted Stanley (1994). Visual impairments such as binocular fixation and poor

vengeance control can cause difficulties with the processing of letters and words on a page text argued Stein and Fowler (1993), in addition increased visual crowding can also cause difficulty in reading Spinelli et al. (2002). Evans (2001) highlighted that children with dyslexia report blurred vision, omitting words, losing place, and moving print, these visual symptoms are present in them more than in good readers.

Stein et al. (2001) reported that the magnocellular path (large cells) which is responsible for the timing of the visual events is impaired in some individuals with dyslexia resulting in visual processing deficit and abnormal binocular control. While many studies supported the existence of visual deficits in developmental dyslexia, Reid and Fawcett (2004) argued that visual deficits on reading acquisition were not clear. Also studies showed that only small numbers of students with dyslexia exhibited visual deficits Wright & Conlon (2009).

### **2.6.2.3 The Cerebellar Deficit Hypothesis**

The cerebellum is located in the back of the human brain, and is regarded as a key brain structure for cognitive skills acquisition including language dexterity. One of the functions of the cerebellum is the precise timing of procedures that accomplish some sort of behavioral response or task performance (Reid 2016, p. 22). The cerebellum plays a major role in motor coordination, automatization of learned tasks like reading and typing, as well as in supporting cognitive processes. Therefore, any impairment in the cerebellum may lead to dysfunctional speech articulation; the inability to learn phoneme-grapheme correspondences; it also affects the coordination of sensory data acquisition. Nicolson and Fawcett (1990, 1995, & 2001) proposed the DAD hypothesis (the Dyslexia Automatization Deficit) in which they explained that dyslexia is due to the impaired ability to automatize motor and cognitive skills among dyslexic individuals due to Cerebellar impairment. They argued that non dyslexic children are able to learn the phoneme-grapheme correspondence which turns to be automatic; on the other hand the children with dyslexia fail to reach this level of automatization. Reading is subject to automaticity and since all dyslexia hypotheses predict poor reading as a factor in dyslexia, so the automatization would be valid in relation to dyslexia.



#### **2.6.2.4 The Magnocellular Theory**

Stein and Walsh (1997) claim that dysfunction in individuals with dyslexia is due to visual, auditory and tactile processes, Hari and Renvall (2001) report that magnocellular dysfunction accounts for the known manifestations of dyslexia which are: auditory, visual, motor and tactile.

Many studies highlighted the fact that any magnocellular abnormality leads to problems and difficulties in rapid processing. Stein (2001) claims that instability in the magnocellular system leads to words order blurring which in turn leads to inability to perceive letters correctly and consequently results in reading difficulties among individuals with dyslexia. Also, Chase et al. (2003) reported that the red color suppresses the magnocellular pathways and activates the parvocellular pathways.

The magnocellular theory received criticism for not providing justification for the absence of motor and sensory dysfunction among many individuals with dyslexia as highlighted Ramus (2001).

### **2.7 Interventions for Dyslexia**

Decoding, fluency, and comprehension are regarded as important aspects for teaching reading. The National Reading Panel (2000) stated effective interventions of teaching reading in systematic phonics, vocabulary instructions, repeated readings, and comprehension strategy instructions. These tools would be very beneficial for children who are experiencing difficulties in reading.

As far as children with dyslexia are concerned, phonological intervention is identified as an effective remediation reported Schneider et al. (2000), also many other components have been combined to the phonological intervention like teaching of specific word identification together with self-directing dialogues highlighted Morris et al. (2012).

Important achievement in reading may be reached through early intervention based on letter/sound correspondence, phonemic awareness, and fluency reported Shaywitz et al. (2003). Many phonologically-based programs have asserted successful outcomes in managing dyslexia. Dr. Samuel T. Orton and his colleagues Anna Gillingham and Bessie Stillman were the first who initiated multisensory techniques with students with dyslexia reported Gough (1996). Starting from Dr. Maria Montessori's kinesthetic methods, Orton applied multi-sensory learning through the use of kinesthetic support of visual and auditory relations in order to correct the tendency to transfer the sequence of letters made by his students with dyslexia highlighted Gough (1996). The Orton Gillingham is a phonologically-driven program that is featured with its multisensory instructions that focus on the learning of alphabetic phonics in a systematic, analytic, cognitive, sequential and cumulative, and emotionally sound manner (Gillingham & Stillman, 1997). The OG program focuses on explicit instructions in phonology, phonology awareness, sound-symbol correspondence, syllables, morphology, syntax and semantics (Ritchey & Goeke, 2006). However, its effectiveness is not validated due to the fact of inadequate sample sizes, also OG was effective for word recognition and word expression improvements but not for sentence reading (Hwee & Houghton, 2011).

The Phono-Graphix program for teaching reading is claimed to be an altogether, speedier, and more effective approach (Mc Guinness and Mc Guinness, 1998). The authors of this program Mc Guinness et al. (1996) state that drilling in onset/rime (eg. In the word *beak* 'b' is the onset and 'eak' is the rime) teaches the child to memorize part of the word as if it were a unit when in fact it is a number of distinct sounds. This approach teaches that letters do not make, but rather, represent sounds (Mc Guinness and Mc Guinness, 1998). The Phono-Graphix program focuses on three levels for skills teaching: the basic and the advanced codes, then the multi-syllable management. It starts with segmenting, blending, and phoneme manipulation, then introducing one-to-two mapping when two letters stand for one sound, after that students are taught to blend sounds into syllables and then syllables into words. Dias and Jupiter (2002) carried out a study involving Phono-Graphix as an intervention for students with reading difficulties, the finding emerged from their study were positive for Phono-Graphix use as the students taught through it made considerable progress.

The Wilson Reading System (WRS) is a program that emerged from research results that prop up phonemic deficits as a basis for dyslexia and it is supported by the US department education, it was created by Barbara A. Wilson, it is based on Orton Gillingham philosophy and phonological coding research. The program involves reading instructions focusing on phonemic awareness. Also, it is a highly structured cumulative program that includes explicit teaching of all concepts using multisensory activities Rowley, R., McCarthy, M. and Rines, J.C. (2014). A recent study claimed that children with disabilities taught using this program showed some improvement in reading comprehension skills highlighted Stebbins, Stormont, Lembke, Wilson, & Clippard (2012), yet no published studies reviewed these claims.

Due to the considerable debate about the etiology of dyslexia, interventions for dyslexia did not lie particularly on phonology, as some intervention programs discounted entirely the phonological deficits idea. The magnocellular theory of dyslexia adopts interventions that are not phonologically-driven at all, as it espouses the concept of vision training as a method of intervention.

Research didn't recognize yet which type of intervention works better than another for teaching individuals with dyslexia, as each learner with dyslexia has strengths and weakness, however, it is agreed that early intervention is the best remediation for children with dyslexia.

## **2.8 Common Misperceptions about Dyslexia:**

'A letter or word reversals' is one common misconception about dyslexia, parents and teachers think that students who experience such thing fall under this disorder, however, this is not a reliable indicator as young learners may show these reversals. Adams (1990) suggested that these reversals are indicating the developmental level of students and not the possibility of dyslexia. On the other hand, most children do not keep these developmental reversals for long, but children with dyslexia seem to retain them.

Another misconception about dyslexia is the belief that boys are more afflicted by the disorder than girls as pointed out Shaywitz, Fletcher & Escobar (1990); in fact boys as well as girls are

almost equally afflicted by the disorder (Shaywitz et al. 1990). This misperception is based on the fact that boys get over-identified with dyslexia compared to girls because boys get engaged in externalizing behavior which is seen as aggressive and disruptive to classroom learning reported Ness and Southall (2010).

The life course of dyslexia is also misconstrued as many people think that this disorder can be outgrown (Tremaine Foundation, 2010) which in fact not true as dyslexia is a lifelong disorder (Shaywitz et al. 2003) and intervention and remediation are done just to lessen the symptoms of this disorder and help the individuals with dyslexia to read better.

Another common perception about dyslexia is that high achieving students with good grades cannot have dyslexia (Shaywitz, 2013), however, students with dyslexia who get a chance to appropriate intervention can succeed academically, but still they will always require compensatory skills to read and learn highlighted Shaywitz (2013).

Many people think that individuals with dyslexia see the words jump or move while reading stated Badian (2005), this misconception implies that dyslexia is a visual problem, but dyslexia is primarily a phonological deficit, which involves auditory processing and memory (Badian, 2005). Individuals with dyslexia do not see the words differently; rather they experience difficulty in making and remembering the connections between the symbols on the page and the sounds they represent (Tunmer & Greaney 2010).

Another misconception about dyslexia is that this disorder is caused by laziness. Teachers and parents may think that their smart students who fail academically don't make enough efforts. Therefore, they advise them to try harder and read more. However, students with dyslexia work hard and their workload is sometimes three times more than that of their peers without dyslexia, just because they are told to try harder (Denhart, 2008).

Finally it is also perceived that students with dyslexia have low intelligence reported William and Lynch (2010). Teachers and parents who lack knowledge about dyslexia think that students who

struggle to read have intellectual deficit but in fact they have phonological deficit. Many research studies stated that children with dyslexia have average and above average intelligence as pointed out William and Lynch (2010).

## **2.9 Effects of Dyslexia**

The first effect of dyslexia is the academic impact, Tanaka et al. (2011) report that difficulty in learning how to read leads to academic underachievement. Also, when dyslexia is not addressed, failure in reading can translate into many behavioral issues like self-esteem (Glazzour, 2010), anxiety (Stuebing, 2012) as well as externalizing behavioral issues in classrooms.

Reading ability among students with dyslexia is lower than their peers without the disorder. This reading issue influences other subjects and cause lowered performance in various academic subjects such as learning foreign languages, mathematics and science reported many studies, which in turn lead to feelings of inferiority among students with dyslexia. Humphrey (2002) suggests that children with dyslexia manifest lower self-esteem compared to children without it.

Mugnaini et al (2009) state that dyslexia can be the cause of anxiety and depression among students with this disorder, many studies confirmed that students with dyslexia display high levels of depression and stress highlighted Koulopoulou (2010).

## **2.10 Summary**

Dyslexia is a hidden disability which is fraught with lots of misperceptions. Many people think that people who suffer from dyslexia see words jumping around on the page (Badian, 2005), they also believe that individuals with dyslexia are lazy and lack effort (Benhart, 2008), or have low intelligence. There is another belief that boys are afflicted with dyslexia more than are girls (Shaywitz et al. 1990) and dyslexia can be outgrown (Terraine Foundation, 2010).

Undiagnosed dyslexia can lead to difficulties with learning to read (Tanaka et al. 2011), as well as externalizing behavioral issues (Shaywitz et al. 2003). Dyslexia can also lead to emotional and

behavioral issues like anxiety and depression (Koulopoulou, 2010). Identification of dyslexia is the first step in remediation especially in early years.

Since students with disabilities including dyslexia spend more time in general education classes due to inclusion, general education teachers become more responsible for teaching these students highlighted Harr-Robins et al. (2012). However, many researchers stated that general education teachers lack appropriate preparation to teach students with dyslexia.

## **3 Chapter Three: The Research Methodology**

### **3.1 Introduction**

Due to inclusion more children with dyslexia are learning in mainstream classrooms reported Harr-Robins et al. (2012). However, general education teachers may lack information about dyslexia (Ness & Southall, 2010) which influence intervention with these students who remain underserved in such settings.

The purpose of this research study is to investigate UAE regular teachers' awareness about dyslexia and at the same time to document how can teacher's knowledge about dyslexia influence intervention quality with students with dyslexia, the conceptual framework was designed to answer the research questions stated in the Introduction of this study.

- 1- To what extent are regular teachers in UAE knowledgeable about dyslexia?
- 2- How does teacher's awareness about dyslexia impact intervention on students with dyslexia?

This chapter describes the methods used to fulfill this study. A convergent parallel mixed methods approach was followed to collect and analyze the data. A questionnaire was used to measure teachers' knowledge about dyslexia in UAE schools and at the same time a case study was conducted by the researcher to get in depth insights from an inclusive classroom where a student with dyslexia was studying.

### **3.2 Research Design**

The research design adopted for this study is a convergent parallel mixed methods design, Fraenkel and Wallen (2006) suggest that the educational research should be a mixture of quantitative and qualitative approaches since research in education requires a variety of questions that move in a variety of directions and this requires in turn a variety of methodologies and tools.

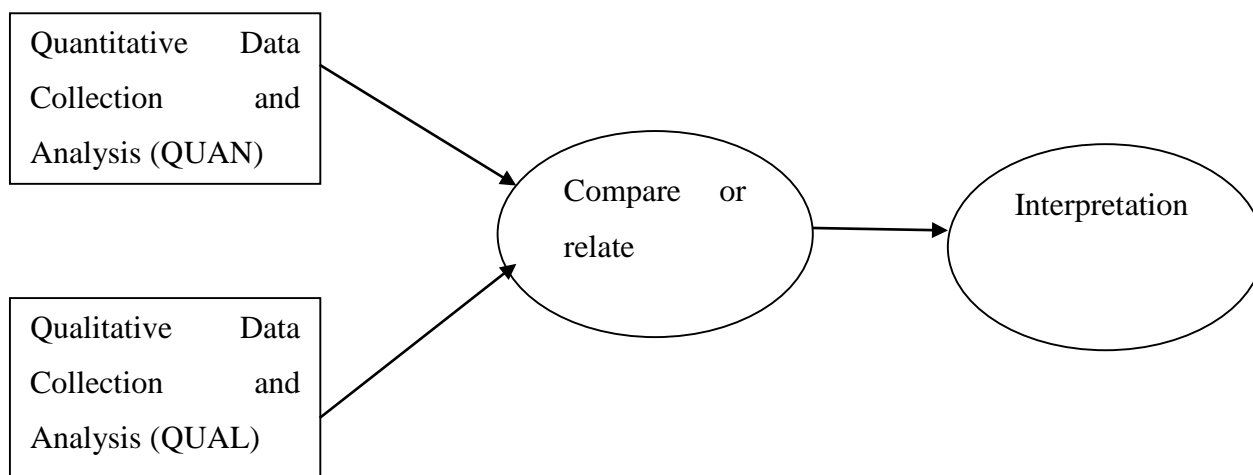


Figure 2: Convergent Parallel Mixed Methods Design, Creswell (2014)

This research study used a mixed methods approach which combined qualitative and quantitative data, the reason behind using it is that qualitative and quantitative methods had bias and flaws, so by combining both qualitative and quantitative data, the weaknesses of each form of data is neutralized as reported Creswell (2014). So, qualitative and quantitative data are converged and mixed together to provide a comprehensive thought of the research problem. Also, data collected from both methods are integrated for the interpretation of the overall results.

The researcher used a questionnaire to investigate teachers' awareness and knowledge about dyslexia in the UAE schools, and to evaluate the process of intervention with a student with dyslexia she used a case study. Robson (2002) states that to evaluate a process, a flexible strategy that focuses on words rather than on numbers is required which is a case study. The researcher grabbed the opportunity being a teacher to a student with dyslexia one year before taking special education studies and after being knowledgeable about learning difficulties including dyslexia, the teacher-researcher discovered the big difference in her attitude, and in dealing with the same student during two consecutive academic years with totally different ideas, the researcher's knowledge about dyslexia revealed the answer to the big question she had about the student's failure in reading.



### **3.3 Quantitative Data**

#### **3.3.1 Dependent and Independent Variables**

The independent variable in this study was teachers' awareness about dyslexia which if effectively monitored brings desirable changes to the problem under consideration (intervention with students with dyslexia), the dependent variable (problem variable) was intervention with students with dyslexia.

#### **3.3.2 Questionnaire Survey**

Fraenkel and Wallen (2006) defined the survey as an attempt to get information from members of a population to identify the actual status of that population regarding one or more variables.

In order to answer the research question related to teachers' awareness and knowledge about dyslexia, the researcher used a questionnaire developed by an Irish colleague; the first section elicited demographic information about respondents. The second section was used to measure teachers' understanding of dyslexia, it includes 11 items using true, false or untrue answers, the third section was used to measure teachers' competency in dealing with dyslexia, and it includes 12 items using a 5-point likert-type scale. The fourth section was used to identify classroom strategies as well as ways of supporting students with dyslexia; it included 13 items using 5 point-scale (not at all, a great deal). The researcher piloted the questionnaire with 7 teachers in her school. Their feedback was used to revise the questionnaire; also they informed that online survey is not a good option, so the questionnaire was distributed on paper. The main goal is to describe the status of the teachers' awareness about dyslexia, and they were asked to answer a series of self-report items, their responses provided data about the targeted population without any change in their environment, besides the researcher was not a part of the environment.

Section one includes a covering letter about the purpose of the questionnaire as well as the demographic information. It was used to gather information related to the teachers' years of teaching experience, qualifications, age range of classes taught at present, and gender.

Section two measures teachers' understanding about dyslexia, it includes 11 items using true, false or unsure scale (see Appendix --) and it contained the following items:

- Dyslexia is a continuum ranging from mild to severe.

- People with dyslexia often have co-existing difficulties.
- Traits of Dyslexia are always obvious and easy to identify.
- People with dyslexia always have above average intelligence.
- Dyslexia can be detected on MRI scans.
- Teaching phonological awareness helps prevent reading difficulties.
- The strongest indicator of dyslexia is reversal / confusion of letters.
- Early speech and language difficulties are often a pre-cursor to dyslexia
- People with dyslexia always have difficulty reading a text.
- Dyslexia affects girls more than boys.
- Dyslexia affects 15% of the population.

Section three was used to measure the degree of teachers' knowledge/competency in dealing with students with dyslexia. The scale consisted of 12 items using a 5-point Likert-type scale, and it contained the following items:

- I am aware of the many and varied traits common to students with dyslexia
- I feel competent at differentiating for students with dyslexia.
- I have the skills necessary to meet the needs of students with dyslexia in my class.
- I believe my class is a “dyslexia friendly classroom”
- I actively use strategies and approaches specifically for students with dyslexia.
- I can identify students in my class who have/ or who are at risk of dyslexia.
- I am willing to seek further advice and information about dyslexia from Special Educational Teachers.
- I believe it is essential to read about dyslexia
- I have voluntarily researched about dyslexia outside of school hours.
- I believe the class teacher has the main responsibility for enabling students with dyslexia to fully access the curriculum.
- I feel competent and willing to express my concerns to a parent of a child with suspected dyslexia.

- I believe it is important to be familiar with and refer to the Special Educational Policy at my school.

Section four was used to measure the degree of teachers' knowledge regarding Classroom practice / strategies about teaching students with dyslexia. The scale consisted of 13 items using a 5-point scale (not at all – a great deal), and it contained the following items:

- Differentiation
- Using visual aids/resources
- Using multi-sensory teaching approaches
- Giving a reduced amount of homework
- Allowing extra time to complete tasks
- Direct instruction
- Explicit explanation of tasks
- Use of personal laptop
- Use of ICT
- Using graphic organizers
- Having an IEP in place
- Keeping a personal dictionary
- Giving explicit praise

### **3.3.3 Reliability Test**

Cronbach Alpha is a reliability test usually conducted to identify the internal consistency of questionnaires as well as to assess the homogeneity of questionnaires items. The coefficient is computed from 0 to 1. Tavakol & Dennick (2010) report that an alpha value ranging between 0.70 to 0.95 indicate a good correlation between items in the questionnaire, and therefore the questionnaire is reliable.

To examine the internal consistency of the research questionnaire, the Cronbach's Coefficient Alpha was computed, the questionnaire has a Cronbach's Alpha internal Consistency Coefficient of  $0.766 > 0.6$  which means that the reliability is good.

### **3.3.4 Data Gathering**

With the help of some colleagues, the researcher distributed the questionnaires during term 2 of the academic year 2016-2017. The teachers targeted to answer the questionnaire are regular English teachers for all levels in public and private schools in Dubai, Sharjah, Abu Dhabi and Al Ain.

### **3.3.5 Population and Sampling**

The participants were requested to complete general information in the first page of the questionnaire; 1- teaching experience, 2- the breakdown of the teaching experience, 3- additional teaching qualifications, 4- the age of the students the participant is teaching at present, 5- the gender of the participant. The data gathered was analyzed using IBM – SPSS and ANOVA.

### **3.3.6 Quantitative Analysis**

Although more than 50 questionnaires were distributed, the number of respondents was 29 teachers only, despite the fact that it was aimed to reach a larger number of respondents. This was due maybe to the fact that teachers are usually over loaded with work and preparation of lessons, so to spare time to answer a questionnaire which is not required from their schools is not attractive. Therefore, the sample size used for data analysis was 29. Data was analyzed following SPSS and ANOVA. The frequencies (counts and percentages) of the responses to each question were tabulated.

## **3.4 Case Study**

A case study was incorporated into the research design to investigate the intervention with a student with dyslexia in a private school; it was carried out by the researcher herself being the teacher. The case study is “an in depth inquiry that investigates a contemporary phenomenon within its real life context” (Yin, 2012, p.15). It investigates important topics that are not easily covered by other methods as stated Green, Camili and Elmore (2006).

The conceptual framework for this study was designed to answer the research question for this study. Data collection for this study was easy for collection since the researcher is the teacher of the subject student, and the outcomes of intervention with the student appeared straight forward.

Evaluating a process requires a flexible strategy which focuses more on words than on numbers stated Robson (2002). The teacher-researcher decided to grab the opportunity exemplified in having a dyslexic student in her class, to apply an intervention plan and the student's progress (a phenomenon) within classroom setting (its real life context).

Yin (2003) classified case studies as exploratory, descriptive and explanatory; this case study can be considered as explanatory since the purpose set for it was to find how intervention with a dyslexic student works.

### **3.4.1 Description of the subject student**

Rose (pseudonym) was 17 years old girl in January 2017 when this study started. Rose is a lovely Arab student; she was the researcher's student since year 2016 when she was a ninth grader, at that time, the researcher didn't start studying elective modules of special and inclusive education, and dyslexia was not so clear to the researcher by that time (2016).

Rose was labeled by all her teachers including the researcher as well as her classmates as lazy, careless, weak and shy student. So, she was not given much attention from all her teachers and even her classmates, which automatically impacted on her self-esteem as she usually sits alone and far from other girls, also, she avoided mingling with her peers, in addition to her limited participation in the class.

### **3.4.2 Description of the context /peers**

Rose is a tenth grader in a regular classroom, the school occupies a big building; it contains three sections: KG and elementary section, Girls section and Boys section. The school is an American private school, and the curriculum follows California common core standards.

Rose has 15 peers; they are all females aged between 15 to 16 years old, and Rose is the oldest student in her class. Her classmates are from different countries (Syria, Palestine, Afghanistan, Lebanon, Egypt, Uzbekistan, Iraq, and UAE). The dominant language between the girls either in the classroom or in the playground is English, but they tend to use Arabic from time to time. However, Rose's interaction in English is very limited as she uses Arabic for communication.

Rose's relation with her peers is very limited as they rarely get interested by her; she used to get in touch with one girl only who in turn has special educational needs. However, and since the teacher/researcher revealed her plan and sought help from the girls, and explained to them that Rose has dyslexia and she is not lazy, and all she needs is their help and support. After that the girls got interest more in her and this was obvious in their sympathy with her.

### **3.4.3 Description of the Instructional Intervention**

The researcher reviewed many research studies about interventions that were conducted to help students with reading disabilities, and came to the result that the best intervention that suits Rose's case will be a low cost plan that uses peers as tutors and focuses on teaching letter-sound association (phonics), identification of high frequency words, and repeated readings. Since Rose could barely recognize some letters ; she confuses between similar letter like "b" and "d", "p" and "q", and even being a tenth grader, she cannot even write her name properly, therefore, Rose can be considered as straight illiterate and there was no need for pretest to measure her literacy and reading skills depending on known scales. Also, the researcher decided that after training rose in phonics (letter-sound correspondence), the training on reading will be on texts taken from second grade-level text book (Journeys) followed by American Curriculum Schools.

The teacher- researcher formed a group of volunteers from Rose's peers and set time and date to start the intervention program, the tutoring process consisted of the followings:

1. The tutoring lesson starts with training on letter-sound correspondence (phonics) and reading the letters isolated or inside the words, this is considered as a warming up.
2. Rose has to be trained on reading a set of cvc words, and high frequency words on a daily basis, followed by spelling two to three words, and the number of spelled words will be increased gradually, in order to boost her word identification skill.
3. A reading model strategy will be followed to improve Rose's oral reading fluency; the subject student has to listen to a fluent reading performed by the volunteered peer from a text from Journeys second-grade level text book.
4. Rose has to read the same text together with her peer (partner reading).
5. Rose then reads on her own and her partner guides and corrects her.

6. Repeated readings will follow and word count per minute will be recorded to manipulate Rose's progress.

Several Rose's classmates showed enthusiasm, but N was the best and during the intervention program worked really hard with her. She approached the teacher/researcher on the spot and asked for the requirements; actually N did a great job with Rose. The teacher/researcher provided the girls with a diary to note down dates and times and all remarks regarding Rose's progress. N started working with Rose within two days.

After that things went smoothly, at every reading period, N most of the time sits with Rose and teaches her phonics and reads with her, the teacher-researcher supervises the tutoring process and interferes from time to time to guide N in her work and note down her feedback. It became a routine that N teaches Rose and the teacher-researcher noticed that N extended her help to Rose to all subjects as Rose now is eager to understand and learn.

With the coming weeks other girls started helping N in her work with Rose, N was happy to share her experience and to guide the other girls in tutoring Rose as well.

#### **3.4.4 Qualitative Analysis**

Data collected in case study will speak for themselves claimed Green, Camili and Elmore, 2006. However, many researchers using qualitative research methods describe in sufficient detail how they interpreted their data (Creswell 2014). So, it might be hard to determine the validity of conclusion drawn from the qualitative analysis.

Various categories were developed to bring order to the qualitative data, as well as giving insights into the context. The following categories were used to monitor Rose's progress:

- Phonological awareness
- Word recognition
- Oral reading skill

Also, the following categories were used to give insights into the context:

- Rose's behavior and self esteem
- Teacher-researcher 's attitude

- Peers' attitude

Within each category, data was summarized; objectives set ahead to Rose were used as a baseline data to measure Rose progress and to judge her achievements.

### **3.5 Challenges / Limitations**

The first limitation and the main challenge in this study was time management, mixed methods studies require a considerable amount of time and effort to complete successfully (Creswell 2014), and to handle a mixed method research individually was not an easy task, as mixed methods research is seldom a solo endeavor (Browsers et al. 2013, Lavelle et al. 2013), being a full time teacher and a postgraduate student adding family commitments slowed down the research process. So, due to limited time the researcher began data collection for the case study in the second week of term two of 2016-2017 precisely in January 2017 together with the distribution of the questionnaires; yet getting the questionnaires back took longer time especially from the school located in Al Ain which is very far from researcher's location and only a colleague volunteered to collect them.

The second limitation was the number of questionnaires distributed and received back due to limited time and resources. Moreover, the case study could be oriented only around one student. The study was a small scale with 29 participants only; also it was restricted to female teachers as teaching attracts females more than males. Therefore, the ability to generalize the results from a small scale study to the whole population of teachers in the UAE may be limited

Another limitation was that research on dyslexia in the UAE and in the Arab culture is limited, and based on that the conceptual framework of this study relied mainly on data derived from research in Western culture.

The last limitation was that the respondents may have provided biased responses to questionnaires, as their responses could be distorted by social desirability bias referring to the respondent desire either at a conscious or subconscious level, to present a favorable image of themselves, and/or their organizations (King & Burner, 2000 ). Also Paulhus (1991) highlighted that some respondents have the tendency to provide positive, agreeable, or optimistic answers to most questionnaire items even if they don't believe these answers to be true. Moreover, self-reported



questionnaire was used to collect the data for this study. Some respondents might not take the questionnaire seriously while filling it out. So, the questionnaire as a self-reported instrument can be affected by the perceptions, feelings, personal judgments, and biases of the respondents.

### **3.6 Summary**

This convergent parallel mixed methods study aims to investigate regular teachers' knowledge and perceptions of dyslexia in the UAE schools and how could a better understanding of dyslexia impact intervention plans among students with dyslexia. Therefore, a questionnaire was used to measure quantitatively teachers' understanding of dyslexia and effective strategies used to serve students with dyslexia, and in the meantime a case study was conducted by the researcher to examine qualitatively the effect of an intervention plan on a student with dyslexia.

## **4 Chapter Four: Data Analysis and Findings:**

### **4.1 Introduction**

This chapter reports the results of this study and the data analysis. The objectives of this study are twofold: to investigate: a) teachers in UAE awareness about dyslexia and the appropriate use of intervening measures to serve students with dyslexia, and b) the teachers awareness influence on intervention quality with students with dyslexia. More specifically, this study addressed the following research questions:

1. Are teachers in the UAE aware of dyslexia and using appropriate intervening measures to serve students with dyslexia?
2. To what extent does teacher's awareness influence intervention quality with students with dyslexia?

A convergent mixed methods study was adopted by the researcher to collect both quantitative and qualitative data at the same time. Questionnaires were used to check teachers' understanding of dyslexia and a case study was conducted by the researcher to study the impact of an effective intervention plan for a dyslexic student.

The quantitative data were analyzed using IBM's Statistical Package for Social Studies (SPSS) software and ANOVA, as for the case study it was analyzed based on observations and progress achieved from the subject student.

### **4.2 Quantitative Data Analysis**

#### **4.2.1 Demographic Information**

The participants in this study consisted of 27 (93%) female teachers and 2(7 %) male teachers. So, the majority of the sample was female teachers and this is the typical make-up of gender in Schools (See table 1.1).

Table 1 Frequency of gender in the sample size:

Variable		Frequency	Percent
Gender	Male	2	7%
	Female	27	93%
Total		29	100%

The participants of the study varied in the years of teaching experience as, they have either to 16 years or more 6(21%), followed by 15 (52%) who have 6-15 years of teaching experience, and 8(27%) of the participants reported they have 1-5 years of teaching experience (See Table 1.2).

Table 2 Frequency of teaching experience in the sample size:

Variable		Frequency	Percent
Experience range	1 - 5	8	27%
	6 - 15	15	52%
	16 and more	6	21%
Total		29	100%

In terms of classes taught, the majority of participants were teaching in circle two (from grade 6 to grade 9) with 17 (58 %), followed by circle 3(from grade 10 to grade 12) 8 (28%), and finally circle 1 (from grade 1 to grade 5) 4 (14%) (See table 1.3).

Table 3 Frequency of teaching classes in the sample size:

Variable		Frequency	Percent
Circle	1	4	14%
	2	17	58%
	3	8	28%
Total		29	100%

With regards to participants' qualifications, 20 (69.8%) participants reported they are holders of Bachelor degree, 8(28%) Master holders, and 1 participant only holding PHD 1(3%) (See table1.4).

Table 4 Frequency of qualification in the sample size:

Variable		Frequency	Percent
Qualification	Bachelor	20	69%
	Master	8	28%
	PHD	1	3%
Total		29	100%

#### 4.2.2 Teachers' Responses to the Questionnaire

The data analyses results will be discussed in detail for each research question.

To answer the first research question, the teachers were asked to complete a questionnaire of three sections: section1 included 11 statements (true- false- unsure), section 2 contained 5- point Likert scale statements (strongly disagree- strongly agree), section 3 included 13 statements (not at all - a great deal).

RQ#1:

Are teachers in the UAE aware of dyslexia and using appropriate intervening measures to serve students with dyslexia?

For the data analysis the percentages per question were used to analyze the data as well as the independent group t- test which was used to determine whether the teachers' gender has had an

impact on their understanding of dyslexia by comparing the means of the dependent variable which was the overall understanding of dyslexia mean score of the teachers and the independent variable which was the teachers' gender. Additionally, by comparing the means of the dependent variable which was the overall knowledge/ competency in dealing with dyslexia mean score of the teachers and the independent variable which was the teachers' gender.

One Way Analysis of Variance (ANOVA), was used to determine whether there was any significant difference between the mean scores of independent groups which were teachers' experience (beginner, intermediate, advanced), qualification (bachelor, master, PHD) and the cycle they teach (cycle1, cycle2, cycle3) have had an impact on the dependent variable which was the overall understanding of dyslexia mean score of the teachers. Additionally, One Way Analysis of Variance (ANOVA) was used to determine whether there was any significant difference between the mean scores of independent groups which were teachers' experience beginner, intermediate, advanced), qualification (bachelor, master, PHD) and the cycle they teach (cycle1, cycle2, cycle3) have had an impact on the dependent variable which was the overall knowledge/ competency in dealing with dyslexia mean score of the teachers.

With regard of the teachers' understanding of dyslexia in The UAE, participants were asked to respond to 11 statements with true-false-unsure, the results; as shown in Table 1; indicate that the teachers in the UAE are somehow aware of dyslexia. The percentages of their correct answers ranged between 10% - 90% (see items 1, 3, 4, 6, 8, 9, 10). The majority of the teachers answered correctly 7 questions out of 11 questions.

By examining the data, it is obvious that the statement with highest percentage was the one about the severity of dyslexia which can range from mild to severe (item 1), 89.7% of the teachers agreed on this point. The second highest score was about the definition of dyslexia (item 9), 72.4% of the teachers are aware about the fact that dyslexia has to do with the difficulty in reading a text. The third highest percentage was about the statement which says that raising phonological awareness helps to prevent dyslexia (item 6), 69% of the teachers were aware of one method to prevent dyslexia which is raising phonological awareness among students. The fourth highest percentage was about the statement which states that dyslexia affects girls more than boys (item 10), 62.1%

of the participants answered this statement with 'No' which is correct indeed. The fifth highest percentage was about the statement which says that the traits of dyslexia are easy to be identified (item 3), 58.6% of the teachers answered the question correctly by disagreeing with this statement which means that dyslexia is a hidden disability. The sixth highest percentage was about the statement which says people with dyslexia always have above average intelligence, 51.7% of the participants answered this question with 'No' which means that people with dyslexia do not always have average intelligence. The seventh highest percentage was item 8 which states that early speech and language difficulties are often a pre-cursor to dyslexia was also answered correctly by the participants, 44% of the teachers answered this statement by choosing 'Yes', dyslexia can be predicted through early speech difficulties. These findings indicate that the majority of the participants are aware that dyslexia is not easy to be identified and they also know that difficulty in speech can be a pre-cursor of dyslexia and reading can be used to prevent dyslexia by raising the phonological awareness among students.

The teachers also answered 2 questions incorrectly out of 11 questions in the questionnaire. The item 7; which states that the strongest dyslexia indicator is reversal or confusion of letters; was answered wrongly by 89.7% of the participants, since the reversal or confusion of letters does not always indicate dyslexia. Item 2 which states that people with dyslexia often have co-existing difficulties was also answered wrongly by the teacher with a percentage of 62%. This statement should be answered with 'No' because it is not true that people with dyslexia have co-existing difficulties. These findings indicate that the participants are not really aware about the traits of dyslexia. Only two items were answered with high percentage of 'Unsure'. Item 11 which states that dyslexia affects 15% of the population was answered by 75% of the participants as 'unsure' which is in fact true. Moreover, item 5 which states that dyslexia can be detected in MRI scans was answered by 58.6% of the participants as 'unsure' too. These findings indicated that the participants of this study are not highly knowledgeable when it comes to dyslexia and its co-existence among the population and whether it can be detected through scans or not (see Table 5).

Distribution of all questions answers' from the sample size:

Table 5 Teacher's Understanding of Dyslexia:

Questions	True		False		Unsure	
	#	%	#	%	#	%
Dyslexia is a continuum ranging from mild to severe.	26	89.7	2	6.9	1	3.4
People with dyslexia often have co-existing difficulties.	18	62.1	4	13.8	7	24.1
Traits of Dyslexia are always obvious and easy to identify.	7	24.1	17	58.6	4	13.8
People with dyslexia always have above average intelligence.			15	51.7	13	44.8
Dyslexia can be detected on MRI scans.	3	10.3	9	31	17	58.6
Teaching phonological awareness helps prevent reading difficulties.	20	69	4	13.8	5	17.2
The strongest indicator of dyslexia is reversal / confusion of letters.	26	89.7	2	6.9	1	3.4
Early speech and language difficulties are often a pre-cursor to dyslexia.	13	44.8	7	24.1	9	31
People with dyslexia always have difficulty reading a text.	21	72.4	5	17.2	3	10.3
Dyslexia affects girls more than boys.			18	62.1	11	37.9
Dyslexia affects 15% of the population.	5	17.2	2	6.9	4	75.9

Moreover, to answer this research question with regard of the part of whether the teachers are using appropriate intervening measures to serve students with dyslexia the teachers were asked to complete the Teacher's knowledge/ Competency in dealing with dyslexia scale; by using a five-point Likert scale (strongly disagree to strongly agree). For the data analysis the percentages per question were used to analyze the data.

With regard of the teachers’ knowledge and competency in dealing with dyslexia in The UAE, the results of this study, as shown in Table 6, indicate that the teachers in the UAE agreed on being aware about dealing with dyslexia. By examining the data we can see that most of the items were answered with (Agree) (see items 1, 2, 3,4,5,6, 7, 9, 10, 11), this indicated that most of the teachers are aware of how to deal with dyslexia. More specifically, the teachers are highly knowledgeable when it comes to the traits of dyslexia and the skills, strategies that are needed to meet the needs of the students with dyslexia in the classroom, and also they believed that they were willing to seek help from the special educators as well as informing the parents of such students. Only two items were answered by the teachers with high percentage with strongly agree (see item 8, 12) and the percentages were as 65.5% for both statements. More precisely the teachers knew the importance of reading more about dyslexia as well as the importance of the familiarity with regards of the special education school policy (see Table 6).

Table 6 Teacher’s knowledge/competency in dealing with dyslexia

Questions	SD		D		DK		A		SA	
	N	%	N	%	N	%	N	%	N	%
I am aware of the many and varied traits common to students with dyslexia	1	3.4	1	3.4	5	17.2	20	69	2	6.9
I feel competent at differentiating for students with dyslexia.	3	10.3	5	17.2	5	17.2	13	44.8	3	10.3
I have the skills necessary to meet the needs of students with dyslexia in my class.	1	3.4	11	37.9	2	6.9	13	44.8	2	6.9
I believe my class is a “dyslexia friendly classroom”			8	27.6	9	31	10	34.5	2	6.9



I actively use strategies and approaches specifically for students with dyslexia	2	6.9	7	24.1	4	13.8	13	44.8	3	10.3
I can identify students in my class who have, or who are at risk of dyslexia.	2	6.9	2	6.9	3	10.3	15	51.7	7	24.1
I am willing to seek further advice and information about dyslexia from Special Educational Teachers.	1	3.4			1	3.4	10	34.5	17	58.6
I believe it is essential to read about dyslexia	1	3.4					8	27.6	19	65.5
I have voluntarily researched about dyslexia outside of school hours.	2	6.9	5	17.2	3	10.3	15	51.7	4	13.8
I believe the class teacher has the main responsibility for enabling students with dyslexia to fully access the curriculum.	2	6.90	7	24.14	6	20.69	7	24.14	7	24.14
I feel competent and willing to express my concerns to a parent of a child with suspected dyslexia.	2	6.9	2	6.9	3	10.3	16	55.2	6	20.7
I believe it is important to be familiar with and refer to the Special Educational Policy at my school	1	3.4			1	3.4	8	27.6	19	65.5

Additionally, the teachers were asked to complete section three which is about classroom practices and strategies which the teachers believe they are important in teaching students with dyslexia; by

using a five-point scale (not at all - a great deal). For the data analysis the percentages per question were used to analyze the data.

With regard classroom practices and strategies, the results of this study, as shown in Table7, indicate that the teachers in the UAE agreed that most of the practices strategies suggested are important in teaching students with dyslexia. By examining the data we can see that most of the items were answered with (A great deal) (see items 1, 2, 3,4,5,6, 7, 11, 12, 13), with percentages ranges between 75.9%- 34.5%. These items are about differentiation, visual aids, multi-sensory teaching approaches, reducing homework amount, give extra time, explicit explanation of tasks use of ICT, use an IEP in place, keeping a personal dictionary, giving explicit praise. This indicated that majority of the teachers are aware of how to meet the needs of the students with dyslexia. More specifically, the teachers are highly knowledgeable when it comes to the importance of practices and strategies used in the classroom in teaching students with dyslexia (see Table7).

Table 7 Classroom practice / strategies:

Questions	Not at all		A little		Somewhat		A lot		great deal	
	#	%	#	%	#	%	#	%	#	%
Differentiation					2	6.9	10	34.	17	58.
Using visual aids/resources			2	6.9			8	27.	19	65.
Using multi-sensory teaching approaches					1	3.4	6	20.	22	75.
Giving a reduced amount of homework	2	6.9	2	6.9	7	24.	6	20.	12	41.
Allowing extra time to complete tasks			1	3.4	2	6.9	7	24.	19	65.
Direct instruction	1	3.4			1	3.4	11	37.	16	55.
							9		2	

Explicit explanation of tasks			2	6.9	2	6.9	7	24.	18	62.
								1		1
Use of personal laptop	2	6.9	5	17.	12	41.	4	13.	6	20.
				2		4		8		7
Use of ICT	1	3.4	4	13.	10	34.	3	10.	10	34.
				8		5		3		5
Using graphic organizers	1	3.4			3	10.	16	55.	8	27.
						3		2		6
Having an IEP in place	1	3.4			4	13.	7	24.	17	58.
						8		1		6
Keeping a personal dictionary	1	3.4	4	13.	3	10.	6	20.	15	51.
				8		3		7		7
Giving explicit praise	1	3.4			2	6.9	9	31	17	58.
										6

Table 8 reports the results of the independent t- test conducted to see the impact of the gender on the teachers understanding of dyslexia. The result of this study indicated that the gender had no significant effect on the teachers understanding of dyslexia ( $p > 0.05$ ,  $t = 0.651$ ).

With respect to the experience, the cycle been taught and the qualification of the teachers, a One-way Analysis of Variance (ANOVA) was used to assess the influence of the variance in the experience, the cycle taught as well as the qualification on the teachers understanding of dyslexia (see Table 5). The finding of this analysis indicated that there was no significant difference in the teachers understanding of dyslexia between teachers with different levels of experience (beginner, intermediate, advanced) and between the teachers who teach in different cycles ( cycle1,2,3), as well as with different qualifications ( bachelor, master, PHD) ( $F = 3.138$ ,  $p = 0.060$ ), ( $F = 0.399$ ,  $p = 0.060$ ) and ( $F = 3.301$ ,  $p = 0.053$ ). However, by examining the mean scores of the means, as it is shown in Table 5, there is a difference in means. Teachers in cycle 1 have more understanding of dyslexia comparing to other teachers in cycle 2 and 3. Moreover, the teachers with master's degree

show more understanding of dyslexia than other teachers with other bachelor's degree or PHD ( see table 8).

Table 8 Test of the significance for teacher's Understanding of Dyslexia:

Statement	Mean	Standard deviation	Test
Gender (male – female)	M = 2 F = 2.19	M = 0.00 F = 0.40	Independent sample t test T = -0.651 P-value = 0.521
Experience (beginner, intermediate, advanced )	Beginner = 2.00 Intermediate = 2.33 Advanced = 2.17	Beginner = 0.00 Intermediate = 0.13 Advanced = 0.00	One way ANOVA F = 3.138 P-value = 0.060
Class teach (Circle1, Circle2, Circle 3)	Circle 1 = 2.25 Circle 2 = 2.12 Circle 3 = 2.25	Circle 1 = 0.50 Circle 2 = 0.33 Circle 3 = 0.46	One way ANOVA F = 0.399 P-value = 0.675
Qualification (Bachelor, Master - PHD)	Bachelor = 2.10 master = 2.25 PHD = 3.00	Bachelor = 0.31 master = 0.46 PHD = NC (1 PHD only)	One way ANOVA F = 3.301 P-value = 0.053

Table 9 reports the results of the independent t- test conducted to see the impact of the gender on the teachers' knowledge / competency in dealing with dyslexia. The result of this study indicated that the gender had no significant effect on the teachers understanding of dyslexia ( $p = 0.686$ ,  $t = 0.409$ ).

With respect to the experience, the cycle being taught and the qualification of the teachers, a One-way Analysis of Variance (ANOVA) was used to assess the influence of the variance in the experience, the cycle taught as well as the qualification on the teachers understanding of dyslexia (see Table 5). The finding of this analysis indicated that there was no significant difference in the

teachers' knowledge / competency in dealing with dyslexia between teachers with different levels of experience (beginner, intermediate, advanced) and between the teachers who teach in different cycles (cycle1, 2, 3), as well as with different qualifications (Bachelor, Master, PHD) ( $F=0.209$ ,  $p=0.831$ ), ( $F= 1.069$ ,  $p =0.358$ ) and ( $F=0.386$ ,  $p =0.683$ ). However, by examining the mean scores of the means, as it is shown in Table 5, there is a difference in means. Teachers in cycle 1 are more knowledgeable and competent in dealing with dyslexia comparing to other teachers in cycle 2 and 3. Moreover, the teachers with master's degree show more knowledge / competency in dealing with dyslexia than other teachers with other bachelor's degree or PHD (see table 9).

Table 9 Test of the significance for Teacher's knowledge/competency in dealing with dyslexia

Statement	Mean	Standard deviation	Test
Gender (male - female)	M = 2.00 F = 2.28	M = 0.00 F = 0.94	Independent sample t test T = -0.409 P-value = 0.686
Experience (beginner, intermediate, advanced )	Beginner = 2.13 Intermediate = 2.37 Advanced = 2.17	Beginner = 0.58 Intermediate = 1.19 Advanced = 0.41	One way ANOVA F = 0.209 P-value = 0.831
Class teach (Circle 1, Circle 2, Circle 3)	Circle 1 = 2.88 Circle 2 = 2.15 Circle 3 = 2.19	Circle 1 = 1.44 Circle 2 = 0.58 Circle 3 = 1.19	One way ANOVA F = 1.069 P-value = 0.358
Qualification (Bachelor, Master - PHD)	Bachelor = 2.18 master = 2.50 PHD = 2.00	Bachelor = 0.81 master = 1.20 PHD= NC (1 PHD only)	One way ANOVA F = 0.386 P-value = 0.683

## **4.3 Qualitative Results**

### **4.3.1 Phonological Awareness**

Overall, Rose was tutored for 8 weeks; 3 weeks in January, 4 weeks in February, and 1 week in March in 2017, the intervention program took place from Sunday to Thursday during the reading period that lasts 40 minutes. By the end of the intervention Rose mastered nearly all the letters and their sounds correspondence, however, she still exhibits difficulties in similar letters as prior to the intervention, like “b” and “d”, “p” and “q”, also the problem of recognizing letters like “e” and “y” is still present.

### **4.3.2 Word Identification**

Rose was trained to read and understand high frequency words in addition to the target vocabulary words linked to each text prior to reading it, the strategy used to help Rose in reading the words is phonemic decoding, syllabication, writing the word in the air, and sometimes shaping the words using the play dough. This strategy proved to be very effective as the subject student uses more than one sense to read and decode.

### **4.3.3 Oral Reading Fluency**

Rose was tutored to improve her oral reading fluency through listening first to a reading model (her peer) before she starts reading independently, this strategy is called a Peer- Median repeated reading, in the beginning the focus was on letter-sound basis, then word-level decoding and after that it was reading short texts from second-grade level text book. One of the ways that was used to measure Rose’s progress in oral reading ability is by measuring the cwpm. Rose was encouraged to perform repeated readings of the same text each time in order for her to increase her cwpm, which had a positive impact on her, as she was able to feel a real progress may be for the first time in her entire school life. Rose’s cwpm was improving after each reading which boosted her self-confidence.

Rose started typically from reading “0” word, due to her disability she was unable to read one single word correctly, however, and after the intensive tutoring on letter-sound correspondence, phonological awareness, she started slowly decoding cvc words, and her oral reading fluency

started improving. To measure the progress in Rose’s reading fluency; the cwpm was calculated and recorded for future comparison.

Rose started reading the first text “What is a Pal?” with just one correct word per minute in the first trial, then the cwpm increased to 2, then 4 during second and third readings respectively as mentioned in figure (1). In the second text “The Storm” Rose started with 5 cwpm in the first reading, then 9 cwpm in the second reading and finished by reaching 9 cwpm in the third reading attempt as shown in figure (2). In the text “Curious George at School” Rose was able to start her first attempt with 9 cwpm, then 11, and 14 in second and third reading attempts respectively.

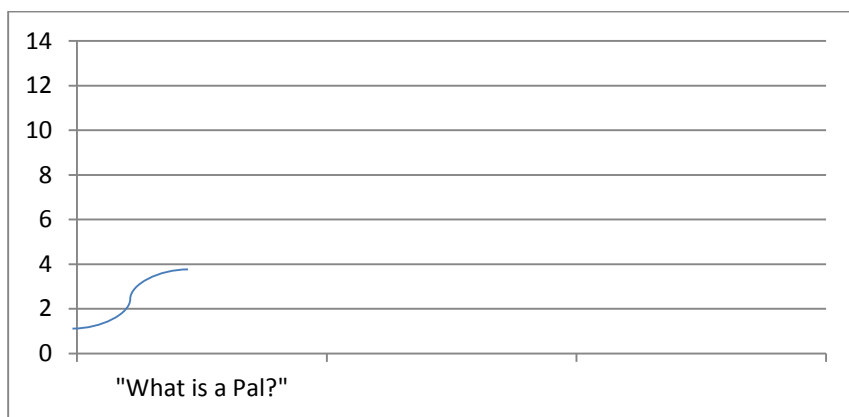


Figure 3 Correct words per minute for the text “What is a Pal?”

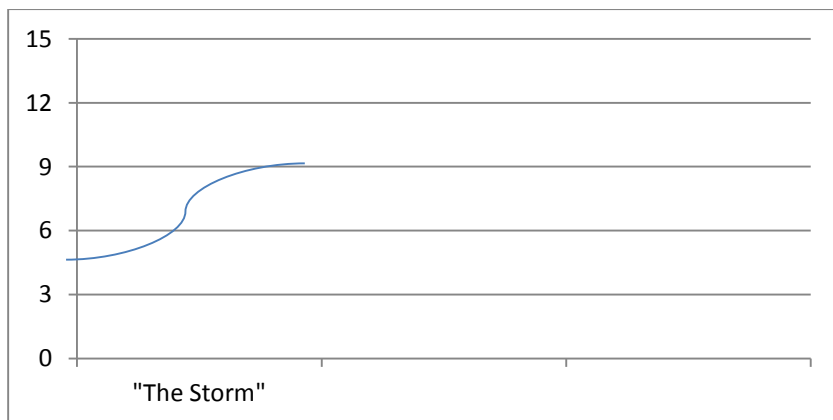


Figure 4: Correct words per minute for the text “The Storm”

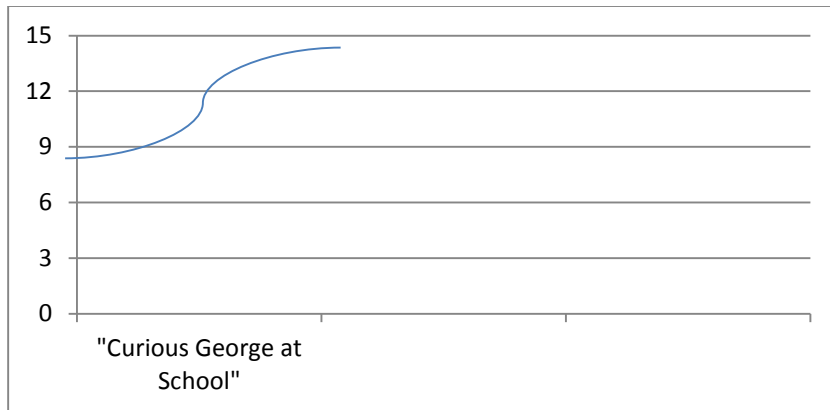


Figure 5: Correct words per minute for the text “Curious George at School

#### 4.3.4 Rose’s Behavior and Self Esteem

Before the intervention program, Rose can be seen to any observant as introvert, shy, and lacks confidence in her own ability; she never takes the risk of answering or reading for fear of failure. Overall, it was obvious to the teacher-researcher that Rose’s self-esteem was very low, and she lacks motivation. However, and after the implementation of the intervention program, Rose’s behavior changed drastically from a shy and isolated girl to a talkative girl who shares her own experiences with her classmates and it is for the first time that the teacher-researcher discovered how does Rose think and act freely, actually she revealed of part of her humorous personality. Rose starts raising her finger to participate in the class even if her answers were not correct, she started giving importance to the learning process by focusing with the teacher-researcher unlike before when she used to sleep during lessons.

#### 4.3.5 Teacher-Researcher’s Attitude

The teacher- researcher’s attitude changed drastically before and after understanding dyslexia, during the previous year and without any clear background of this reading deficiency, the teacher-researcher considered Rose as lazy and careless. However, and after taking lectures about dyslexia in the university, the teacher-researcher’s attitude changed completetly and acted immediately to take necessary measures to help Rose overcoming her problem.



### **4.3.6 Peers' Attitudes**

Rose Peers' attitudes took the same dimension as their teacher-researcher, before knowing Rose's disability, they used to describe her as careless and introvert, and they were not interested in any kind of contact with her. However, and after the teacher-researcher explained Rose's case to them and how her disability is affecting her reading ability and overall academic achievements, the majority of Rose's peers approached the teacher-researcher and requested to take part in the intervention plan. During the intervention, they all showed sympathy and celebrated her progress in reading as if it were theirs. With time Rose was included and accepted by her classmates in their discussions and took part in their day to day routine.

### **4.4 Summary**

The findings gleaned from the case study highlighted that an intervention program consisted of training on phonics; phonology awareness and repeated reading enhanced decoding and literacy skills of a senior student with dyslexia. The improvement in reading boosted her spirits, motivation and overall self-esteem. Also the findings showed that using more than one sense in teaching reading can be more beneficial to a student with reading disability.

## **5 Chapter five: Discussion, Conclusion and Recommendations**

### **5.1 Introduction**

This study aimed to investigate regular teachers' awareness about dyslexia in the UAE schools as well as the appropriate use of intervening measures to serve students with dyslexia. Additionally, it intended to investigate the teachers' awareness influence on intervention quality with students with dyslexia.

The present study adopted a mixed methods research design by incorporating both quantitative and a case study data collection. The teachers' awareness and knowledge about dyslexia in the UAE schools were examined based on the answers given by the teachers to the questionnaire that was distributed to collect quantitative data to measure the participants' perceptions. A case study was conducted to gather qualitative information.

This chapter presents the discussion of the findings gleaned based on the quantitative data and the case study findings analysis. The study findings were compared to other similar studies findings in the literature. Final conclusion, recommendations for future practice and further studies in the field and the study limitations were presented in this chapter.

### **5.2 Discussion**

This study sought to assess the teachers' knowledge and awareness about dyslexia and the appropriate use of intervening measures to serve students with dyslexia in the UAE schools, as well as the influence of this knowledge and awareness on the intervention quality with students with dyslexia. More specifically, the objectives of this study were twofold as follows: to investigate: a) teachers' knowledge and awareness about dyslexia and the appropriate use of intervening measures to serve students with dyslexia in the UAE schools and b) the teachers awareness influence on intervention quality with students with dyslexia. The study also sought to assess the relationship between certain teachers demographic variables (i.e., gender, experience in teaching, level of teaching,) in connection to the first objective, the results of this study indicated that the teachers in the UAE demonstrated a mixture of accurate and inaccurate facts about

dyslexia, this finding is consistent with many studies (Ness & Southall 2010; Rayner, Foorman, Perfetti, Pesetsky & Seidenberg 2001; Washburn et al. 2016; Wadlington & Wadlington 2005; Worthy et al. 2018). Participants of this study demonstrated accurate knowledge about dyslexia concerning the fact that dyslexia has to do with the difficulty in reading a text. This finding is consistent with the findings of several studies as (Albadawi 2012; Worthy et al. 2018), which indicated that the participants are aware of dyslexia as a reading disability. Additionally, participants of this study also demonstrated accurate knowledge of dyslexia concerning the separation between intelligence and dyslexia and this finding is consistent with Washburn et al. (2016) findings 51% of the participants of this study answered the statement stating that People with dyslexia always have above average intelligence with 51% with “No”. This finding is proven in previous studies that reading difficulties do not have any relation with the IQ. For instance Rayner, Foorman, Perfetti, Pesetsky & Seidenberg (2001) stated that studies indicated that there is no relation between IQ and early reading such as in the studies of Briggs and Elkind (1973) as well as Durkin (1966). Stanovich, Cunningham, & Feeman (1984, cited in Rayner. et al. 2001), also IQ is nonspecifically related to reading achievements in the first and second grades. Moreover, the children who have difficulty in reading often have above average IQs (Rawson 1995, cited in Rayner et al. 2001).

The findings of this study revealed that the participants of the study were aware that dyslexia does not affect girls more than boys and this was proven in a study by Shaywitz, Shaywitz, Fletcher & Escobar (1990) stated in their longitudinal research, in a way that girls and boys are equally affected by dyslexia. However, Ness and Southall (2010) stated in their study that males are usually over identified with reading disability because they may be more likely to act out and exhibit frustration in response to their struggles.

Moreover, one of the research findings is the misconception believed by the majority of the participants of this study which is considering word reversals as the strongest indicator of identifying dyslexia (89.7%) this finding is consistent with many research studies such as (Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001; Wadlington & Wadlington, 2005). Wadlington and Wadlington (2005) stated that 69% of the participants agreed that the strongest indicator of

dyslexia is word reversals. Additionally, Adams (1990 as cited in Ness & Southall, 2010) stated that beginning readers whether dyslexics or not write and read letters backwards, which reflects their developing understandings of orthographic representations. Consequently, letters/words reversals alone cannot be used as an early identification marker, though students with dyslexia may be less likely to grow out of letter and/or word reversals (Ness& Southall 2010).

With regard to phonological awareness 69% of the participants of this study were aware of one method to prevent reading difficulties which is raising phonological awareness among students. This was proven in the previous studies. For instance, Ness and Southall (2010) stated that students with dyslexia struggle most with the phonological understandings of language and often fail to connect letters and sounds which makes the task of decoding very hard, and raising the phonological awareness of the students will be beneficial.

With regard to the finding about teachers' knowledge and competency in dealing with dyslexia in The UAE, the participants agreed on being aware about dealing with dyslexia and about the skills, strategies that are needed to meet the needs of the students with dyslexia in the classroom. In the contrary, the findings of a study by Wadlington and Wadlington (2005) stated that participants felt incompetent to deal with individuals with dyslexia in their jobs. They indicated that what they did know about dyslexia resulted from their own personal experiences and searching.

With respect to the gender differences, findings of this study revealed that gender had no significant effect on the male and female teachers understanding and their competence in dealing with dyslexia. Moreover, there was no significant difference in the teachers understanding and competence of dealing with dyslexia between teachers with different years of experience (beginner, intermediate, advanced) and between the teachers who teach in different cycles (cycle1, 2, or 3), and also, among teachers with different qualifications (bachelor, master, PHD). The finding with regard to gender was consistent with Albadawi's (2012) findings which sated that there was no significant difference with regard to gender when it came to the teachers' awareness about dyslexia.

Teachers' awareness about dyslexia has always been proven to be an important factor in intervention with students with dyslexia, the finding of this study confirmed that teachers' understanding of dyslexia impacted the intervention with the subject student, and the intervention program focused on phonics and phonological awareness mainly were a good option. This finding goes in line with Ness and Southall (2010) study findings which highlighted the fact that students with dyslexia benefit from explicit instruction in foundational skills such as phonological awareness, phonics, and phonemic awareness and the teachers must exhibit the skill in understanding our linguistic system and its relation to literacy development.

Furthermore, Mastering the alphabetic principle is essential to becoming proficient in the skill of reading, as well as instructional direct teaching of phonics is more effective (Rayner, Foorman, Perfetti, Pesetsky & Seidenberg 2001). The finding of this study confirmed the value of interventions based on phonics instruction in teaching students with dyslexia, Snowling (2011) study finding confirmed that effective interventions for students with dyslexia should include training in letter-sound, and phonemes awareness. This finding comes in line with the view that phonological awareness training should be complemented by a letter-sound training in order to yield optimal effects (e.g., Ball & Blachman 1991; Bradley & Bryant, 1985; Hatcher et al. 1994, cited in Schneider, 1999)

Also, teacher's understanding of dyslexia can help in identification of students at risk of dyslexia, the finding of this study confirmed this fact when the teacher-researcher identified Rose and tailored a free of cost intervention program that suits her needs, this finding comes in line with a study conducted by Snowling (2013) whose finding indicated that teachers were good judges and their assessments predicted 50% of variability in children reading skills at the end of the year.

Gwernan and Burden (2010) argued that teachers' abilities in dealing with students with learning difficulties is affected by their knowledge about and attitudes towards those difficulties, the finding of this study confirmed that teacher's understanding of dyslexia impacted the attitude toward the subject student and change it from a negative to positive attitude and even the peers' attitudes changed too after understanding the case of their classmate. Furthermore, teachers are described

usually as lacking knowledge and preparation in dyslexia, in addition to empathy toward students with dyslexia argue Macias (2013), this lack of knowledge leads to the fact that students with dyslexia are often portrayed as lazy or stupid, this view comes in line with the finding of this study.

A further notable finding gleaned from this study is the effectiveness of repeated readings on the oral reading fluency, according to a study carried out by Rao, Hawkins and Barkley (2009) using peer-mediated repeated reading strategy to build oral reading fluency among a group of students who showed at-risk indicators for reading failure, the findings indicated that all students improved their oral reading rates with the intervention and this complemented the finding of this research study. Moreover, many research studies suggested providing students with a model of fluent reading as a strategy that strengthens fluency (Cole & Lionetti, 2004; Daly & Matens, 1994; Rasinki, 1990), this comes in line with the same finding taken out from this study.

Another finding emerging from this study is that low self-esteem is correlated even slightly to students with dyslexia, it is resulted from the failure of reading which is generalized to the whole personality as highlighted by Lawrence (1981), which in turn develop to a lack of confidence in one's ability to succeed, and thus the subject student in this study avoids humiliating situations in order to hide her fear of failure. "Once children have entered the swamp of negative expectations, lowered motivation and limited practice, it becomes increasingly difficult for them to get back on the road of proficient reading" (Spear-Swearling & Sterneberg, 1994, cited in Chapman & Turner, 1997).

### **5.3 Conclusion**

Many countries throughout the world support inclusion stated Arif and Gaad (2008), and due to this inclusion more children with dyslexia are studying in regular classrooms, and they are served by regular/general education teachers. However research has proven that general teachers still lack awareness and knowledge about dyslexia (Bell 2013) which automatically affect intervention programs as well as teaching efficacy. Consequently students with dyslexia remain underserved in those settings and the reading gap between them and their peers will increase day after day.

Despite the huge research carried out on dyslexia, a consensus defining dyslexia is yet to be reached, which in turn impacted on intervention programs designed to help students with dyslexia.

The findings generated from this study about whether regular teachers in the UAE schools are knowledgeable about dyslexia or not were consistent with several studies findings, as teachers in the UAE provided a mix of accurate and inaccurate facts about dyslexia. However, and regarding the fundamental question which attributes dyslexia main indicator to letter-word reversals, the participants who answered correctly the question were not a majority, which means that the teachers still lack information about the traits of dyslexia which might impact negatively the intervention plans for students with dyslexia.

Teacher's awareness as well as knowledge about dyslexia is a key factor in any intervention program set to help students with dyslexia, as the more knowledgeable is the teacher the more teaching efficacy and positive attitude he will demonstrate.

Although it is advised that reading interventions should be carried out at early ages to get good benefits, the results of this study suggest that one-to-one fluency training with older students who have reading disabilities can produce significant progress (Mercer, Campbell, Miller & Lane 2000). Furthermore, it is never too late for educational interventions for students with dyslexia, and interventions can be carried out whenever there is a need for them at any time, research shows that multisensory structured language programs can help children of any age even adults learn to read write, and spell (Abbott & Berninger 1999; IDA 2003a; Knight, 1997; Schupack & Wilson 1997, cited in Wadlington, EM & Wadlington 2005)

The reviewed literature revealed that raising the phonological awareness of the students help in dealing with reading difficulties, and students with dyslexia benefit from explicit instruction in foundational skills such as phonological awareness, phonics, and phonemic awareness according to Ness and Southall (2010),and teachers must possess skills in understanding the linguistic system and its relation to literacy development.

The most important thing drawn from this study is that Rose was finally identified as a student with a reading disability even if she is still far behind her peers. In my opinion knowing that a student has dyslexia/reading difficulty is half way, because the challenge is often how to identify that a student has dyslexia in the first place.

#### **5.4 Recommendations**

More research is required on dyslexia, provisions for early identification, professional developments of teachers, and curriculum modification in the UAE context.

Raising awareness about dyslexia is a necessity, Worthy et al., (2018) stated that the participants of the study explained that the training about dyslexia increased their awareness and made them more accustomed to the prevalence of dyslexia and helped to raise the awareness and increased the identification of dyslexia in schools.

There is an urgent necessity for a governmental entity which will govern all legislations and issues regarding dyslexia in the UAE. Also, it is much advisable that this entity will provide free of cost diagnosis for children suspected to be dyslexic.

Teaching is a complex and dynamic practice and teachers are required to continuously learn and inquire about new things in the field.

Literacy is a too complex and it should be taught by experienced teachers, also it recommended that schools in the UAE recruit reading specialists, or teachers devoted just to reading, in order to assist students with dyslexia and poor readers.

School management have to initiate hands-on workshops to raise awareness about dyslexia among teachers and students, and provide inservice training about learning disabilities in general and dyslexia in particular.



Programs targeting students- teachers (preservice teachers) should provide real-life field experiences for pre-service teachers like tutoring students with dyslexia as part of their information intake.

### **5.5 Suggestions for Further Research**

It is hoped that this research to be duplicated with larger sample size of teachers in the UAE, and the intervention program to be replicated with a larger sample of students and for a longer period. Also most the reviewed literature similar to this study was taken from a western context, therefore, more research about dyslexia in the UAE context is required.

### **5.6 Limitations of the Study**

The present study, however, has some limitations. For example the sample is not large due to limited resources and tight schedules which means that it is a small scale study. Also, the random sampling does not guarantee that the participants will be representatives of a larger population, as occasionally the sample differs significantly from the population. Furthermore, self-reported instrument is considered as limitation since the participants might provide biased answers, however, at the same time it provides the best window into prospective teachers' cognition of social context on which teaching takes place argue Beatie (1995). A self-administered, paper and pencil questionnaire was used in this study. This may lead to some participants not filling the questionnaire accurately, so it will not reflect their current situation.

It is certain that Rose (the subject student in the case study) is unlikely to represent a population, also it is unlikely that identical circumstances can be re-created to replicate the study. However, finding accumulation of many case studies can be the basis of developing a theory that contributes in understanding other cases or situations Yin (1994).

Due to time constraints the duration of the intervention plan was too short (8 weeks) to have permanent change, as usually intervention programs set for students with dyslexia take minimum three months to report the results.

Due to the costly diagnosis for dyslexia, it was not possible to diagnose Rose at a specialized center. However, Rose's reading was below age, grade and level of ability Shaywitz (2003) and more specifically her inability of identifying grapheme-phoneme correspondence was obvious, that's why the teacher-researcher raised the red flag and adopted her own assessment, diagnosis, and later an intervention program.

There is no best teaching method for students with dyslexia (Anderson & Sweeney, 2017), therefore, the effectiveness of the intervention program applied in this study, cannot be generalized, because teaching student with dyslexia and struggling readers is too complex, for the simple reason that each student has his/her own strengths and weaknesses.

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# Appendices

## Appendix 1: Questionnaire

Dyslexia Questionnaire
------------------------

Dear Colleague,

As part of my studies, I am consulting teachers about dyslexia. I would be very grateful if you could complete the attached questionnaire. All information will be kept confidential and anonymous.

Thank you for helping with my research and for your time.

Looking forward for your valuable feedback.

Best regards,

Nora Benkohila

General Information
---------------------

1) How much teaching experience do you have at present?

\_\_\_\_\_ years \_\_\_\_\_ months

2) Please state how much of the above experience was at:

a. Primary level: \_\_\_\_\_ years \_\_\_\_\_ months

b. Secondary level: \_\_\_\_\_ years \_\_\_\_\_ months

c. Teaching adults: \_\_\_\_\_ years \_\_\_\_\_ months

d. Special Education: \_\_\_\_\_years \_\_\_\_\_months

e. Leadership/management: \_\_\_\_\_years \_\_\_\_\_months

3) Do you have additional / post graduate teaching qualifications?

Yes \_\_\_\_\_ No \_\_\_\_\_

If you answered yes, please state:

(a) At what level? \_\_\_\_\_

(b) In which subject? \_\_\_\_\_

4) What is the age range of the class (es) you teach at present?

\_\_\_\_\_

5) What is your gender? Please tick : Male: \_\_\_\_\_ Female:\_\_\_\_\_

Teacher's Understanding of Dyslexia
-------------------------------------

Please respond to the statements below by ticking

True (T), False (F) or Unsure (U)

		T	F	U
1.	Dyslexia is a continuum ranging from mild to severe.			
2.	People with dyslexia often have co-existing difficulties.			
3.	Traits of Dyslexia are always obvious and easy to identify.			
4.	People with dyslexia always have above average intelligence.			
5.	Dyslexia can be detected on MRI scans.			

6.	Teaching phonological awareness helps prevent reading difficulties.			
7.	The strongest indicator of dyslexia is reversal / confusion of letters.			
8.	Early speech and language difficulties are often a pre-cursor to dyslexia.			
9.	People with dyslexia always have difficulty reading a text.			
10.	Dyslexia affects girls more than boys.			
11.	Dyslexia affects 15% of the population.			

Teacher's knowledge/competency in dealing with dyslexia

Using the scale below, read each statement, and circle the number that best describes your response.

Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree
1	2	3	4	5

(1) I am aware of the many and varied traits common to students with dyslexia

1	2	3	4	5
---	---	---	---	---

(2) I feel competent at differentiating for students with dyslexia.

1	2	3	4	5
---	---	---	---	---

(3) I have the skills necessary to meet the needs of students with dyslexia in my class.

1	2	3	4	5
---	---	---	---	---

(4) I believe my class is a "dyslexia friendly classroom"

1	2	3	4	5
---	---	---	---	---

(5) I actively use strategies and approaches specifically for students with dyslexia.

1	2	3	4	5
---	---	---	---	---

(6) I can identify students in my class who have, or who are at risk of dyslexia.

1	2	3	4	5
---	---	---	---	---

(7) I am willing to seek further advice and information about dyslexia from Special Educational Teachers.

1	2	3	4	5
---	---	---	---	---

(8) I believe it is essential to read about dyslexia

1	2	3	4	5
---	---	---	---	---

(9) I have voluntarily researched about dyslexia outside of school hours.

1	2	3	4	5
---	---	---	---	---

(10) I believe the class teacher has the main responsibility for enabling students with dyslexia to fully access the curriculum.

1	2	3	4	5
---	---	---	---	---

(11) I feel competent and willing to express my concerns to a parent of a child with suspected dyslexia.

1	2	3	4	5
---	---	---	---	---

(12) I believe it is important to be familiar with and refer to the Special Educational Policy at my school.

1	2	3	4	5
---	---	---	---	---

Classroom practice / strategies

To what extent do you feel the following is important in teaching students with dyslexia? Please tick:

		Not at all	A little	Somewhat	A lot	A great deal
1.	Differentiation					

2.	Using visual aids/resources					
3.	Using multi-sensory teaching approaches					
4.	Giving a reduced amount of homework					
5.	Allowing extra time to complete tasks					
6.	Direct instruction					
7.	Explicit explanation of tasks					
8.	Use of personal laptop					
9.	Use of ICT					
10.	Using graphic organizers					
11.	Having an IEP in place					
12.	Keeping a personal dictionary					
13.	Giving explicit praise					

Please specify which, if any, of the above approaches you are:

- most likely to use? \_\_\_\_\_
- least likely to use? \_\_\_\_\_

## Appendix 2: Questionnaires Received from Respondents

### Appendix 3: Distribution of all Questions Answers' from the Sample Size

#### Teachers' Understanding of Dyslexia

Questions	True		False		Unsure	
	#	%	#	%	#	%
Dyslexia is a continuum ranging from mild to severe.	26	89.7	2	6.9	1	3.4
People with dyslexia often have co-existing difficulties.	18	62.1	4	13.8	7	24.1
Traits of Dyslexia are always obvious and easy to identify.	7	24.1	17	58.6	4	13.8
People with dyslexia always have above average intelligence.			15	51.7	13	44.8
Dyslexia can be detected on MRI scans.	3	10.3	9	31	17	58.6
Teaching phonological awareness helps prevent reading difficulties.	20	69	4	13.8	5	17.2
The strongest indicator of dyslexia is reversal / confusion of letters.	26	89.7	2	6.9	1	3.4
Early speech and language difficulties are often a pre-cursor to dyslexia.	13	44.8	7	24.1	9	31
People with dyslexia always have difficulty reading a text.	21	72.4	5	17.2	3	10.3
Dyslexia affects girls more than boys.			18	62.1	11	37.9
Dyslexia affects 15% of the population.	5	17.2	2	6.9	22	75.9

#### Teachers' knowledge/competency in dealing with dyslexia

Questions	SD		D		DK		A		SA	
	#	%	#	%	#	%	#	%	#	%
I am aware of the many and varied traits common to students with dyslexia	1	3.4	1	3.4	5	17.2	20	69	2	6.9
I feel competent at differentiating for students with dyslexia.	3	10.3	5	17.2	5	17.2	13	44.8	3	10.3
I have the skills necessary to meet the needs of students with dyslexia in my class.	1	3.4	11	37.9	2	6.9	13	44.8	2	6.9
I believe my class is a “dyslexia friendly classroom”			8	27.6	9	31	10	34.5	2	6.9
I actively use strategies and approaches specifically for students with dyslexia	2	6.9	7	24.1	4	13.8	13	44.8	3	10.3
I can identify students in my class who have, or who are at risk of dyslexia.	2	6.9	2	6.9	3	10.3	15	51.7	7	24.1
I am willing to seek further advice and information about dyslexia from Special Educational Teachers.	1	3.4			1	3.4	10	34.5	17	58.6
I believe it is essential to read about dyslexia	1	3.4					8	27.6	19	65.5
I have voluntarily researched about dyslexia outside of school hours.	2	6.9	5	17.2	3	10.3	15	51.7	4	13.8
I believe the class teacher has the main responsibility for enabling students with dyslexia to fully access the curriculum.	2	6.90	7	24.1 4	6	20.6 9	7	24.1 4	7	24.1 4
I feel competent and willing to express my concerns to a parent of a child with suspected dyslexia.	2	6.9	2	6.9	3	10.3	16	55.2	6	20.7
I believe it is important to be familiar with and refer to the Special Educational Policy at my school	1	3.4			1	3.4	8	27.6	19	65.5

Classroom practice / strategies:

Questions	Not at all		A little		Somewhat		A lot		great deal	
	#	%	#	%	#	%	#	%	#	%

Differentiation					2	6.9	10	34.	17	58.
								5		6
Using visual aids/resources			2	6.9			8	27.	19	65.
								6		5
Using multi-sensory teaching approaches					1	3.4	6	20.	22	75.
								7		9
Giving a reduced amount of homework	2	6.9	2	6.9	7	24.	6	20.	12	41.
						1		7		4
Allowing extra time to complete tasks			1	3.4	2	6.9	7	24.	19	65.
								1		5
Direct instruction	1	3.4			1	3.4	11	37.	16	55.
								9		2
Explicit explanation of tasks			2	6.9	2	6.9	7	24.	18	62.
								1		1
Use of personal laptop	2	6.9	5	17.	12	41.	4	13.	6	20.
				2		4		8		7
Use of ICT	1	3.4	4	13.	10	34.	3	10.	10	34.
				8		5		3		5
Using graphic organizers	1	3.4			3	10.	16	55.	8	27.
						3		2		6
Having an IEP in place	1	3.4			4	13.	7	24.	17	58.
						8		1		6
Keeping a personal dictionary	1	3.4	4	13.	3	10.	6	20.	15	51.
				8		3		7		7
Giving explicit praise	1	3.4			2	6.9	9	31	17	58.
										6



**Appendix 3: Rose Peer's Reflection (1)**

**Appendix 4: Rose Peer's Reflection (2)**

**Appendix 5: Rose Peer's Reflection (3)**

**Appendix 6: Reliability Test**

Questionnaire Overall Test of Reliability:

Reliability Statistics

Cronbach's Alpha	No. of Items
.766	68